

Autodesk NavisWorks Review 2009

User Manual

Autodesk, Inc.

Autodesk NavisWorks Review 2009: User Manual

Autodesk, Inc.

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This software is based in part on the work of the Independent JPEG Group.

Contains a modified version of Open CASCADE libraries. See the license file "OpenCascadeLicense.txt" in the NavisWorks installation directory. Source code is available from download.autodesk.com/us/navisworks/OpenCascade.zip.

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Part 1. Welcome to Autodesk NavisWorks Review 2009

Autodesk NavisWorks Review 2009 software enables real-time visualization, exploration, and experience of design projects before they are real. Project quality and reviews are improved through sharing of 3D design data and information, regardless of file size or format. Easy-to-use design review tools improve conveyance and understanding of design intent.

In this documentation set you can find information on:

- Installation
- Basic NavisWorks Functionality

Chapter 1. Autodesk NavisWorks Review 2009 Readme

This section contains late-breaking information about Autodesk NavisWorks Review 2009. For new and updated information about all Autodesk© products, visit our website at <http://www.autodesk.com>.

Installing Autodesk NavisWorks Review 2009

Release Version with Beta

If you have previously installed any beta version (including RC versions) of Autodesk NavisWorks Review 2009, you must completely uninstall these pre-release versions before installing the retail version. Instructions to do this are posted on the beta portal in the Beta Readme files.

Exporters for 64 bit CAD systems

Autodesk NavisWorks Review 2009 includes exporters for 64 bit versions of 3D Studio Max (9, 2008, 2009) and AutoCAD based products (2008, 2009). These exporters are packaged as a separate product within the installer called "Autodesk NavisWorks 2009 (64 bit exporters)". This product will only be available for installation on a 64 bit operating system and will be installed by default.

The 64 bit exporters require Autodesk NavisWorks Review 2009 to be installed for full functionality. Autodesk NavisWorks Review 2009 should not be uninstalled without also uninstalling "Autodesk NavisWorks 2009 (64 bit exporters)".

Customer Involvement Program

During the first week of Autodesk NavisWorks Review 2009 use, a new window will appear to invite you to join the Customer Involvement Program (CIP). By joining, NavisWorks will send anonymous data to Autodesk related to the use of the application.

We strongly encourage you to participate in the program, and assure you there is no risk to your privacy. We hope you will help us improve our product through this effort.

What does CIP track?

- Number of minutes you are running the software.
- Number of sessions that end due to stability issues.
- Menu actions triggered.
- Import/export actions (including file extension used).
- Scene statistics after a load or import (number of objects, faces, vertices etc.).
- Machine configuration (resolution, hard disks).
- Other Autodesk products installed.
- Plug-in (DLLS) installed with NavisWorks.

What does CIP not track?

- There is no way for CIP to track any information related to the user.
- There is also no way to track information outside of Autodesk products.

To turn CIP on and off:

- Turn CIP on or off by going to Help > Customer Involvement Program.
The dialog will appear, allowing you to switch it on or off.

Product Notes

Supported file formats and applications

- For an up to date list of supported file formats and applications go to [NavisWorks Product Center](#).

Autodesk Freedom

- A free 3D viewer for NavisWorks NWD and Autodesk DWF files, Freedom is the answer for those without design software or specialist skills that want to explore a project model.
- Freedom offers an unrestricted, easy to use interface for real-time navigation of even the largest 3D models complete with textures and materials, as well as animation playback, hyperlinks and saved viewpoints.
- Click here to [install Freedom](#).

Resources

- NavisWorks is provided with a number of sample models, which are installed in the `Examples` directory within the Autodesk NavisWorks Review 2009 installation directory
- NavisWorks has a powerful API (Application Programming Interface) that allows developers to customize the product. The API documentation and example files are installed in the `API` directory within the Autodesk NavisWorks Review 2009 installation directory
- NavisWorks has support for ArchVision's RPCs for use with Presenter, and is provided with a number of sample RPC files. The sample RPCs are installed in the `Presenter\lads\layla_data\textures\RPC` directory within the Autodesk NavisWorks Review 2009 installation directory.
- NavisWorks has support for Image Based Lighting through the use of High Dynamic Range Images (HDRIs). The LightWorks User site has a number of resources for users of HDR Images:

[Access the LightWork Design HDRI Resource Page](#)

[Access the LightWork Design HDRI Starter Collection](#)

- Microsoft .NET Framework

Earlier versions of Revit (Building 8 / Structures 2) require the .NET Framework version 1.1 to be separately installed. If the .Net Framework version 1.1 is not installed an error message will be displayed when Revit is started. You can download a copy of the .Net Framework version 1.1 by searching for ".Net Framework version 1.1 redistributable package" in the downloads section of [Microsoft's website](#).

- Adobe Reader

This is free software that enables the viewing and printing of Adobe's Portable Document Format (PDF) files.

NavisWorks documentation is stored in PDF format, therefore, requiring this viewer to read them.

[Download Adobe Reader](#)

Known Problems in Autodesk NavisWorks Review 2009

For an up-to-date list of outstanding issues in Autodesk NavisWorks Review 2009, visit the NavisWorks website at www.autodesk.com/navisworks.

Credits

Autodesk kindly acknowledges the following contributors to the NavisWorks example models:

- National Ice Centre model courtesy of Design and Property services, Nottingham City Council, Nottingham, England.
- Scorpion TKX890 Snowmobile model courtesy of Scorpion Recreational Products, L.L.C. Manistee, Michigan, USA
- City of Bath model courtesy of the Centre for Advanced Studies in Architecture, University of Bath, England.
- Gatehouse model courtesy of Dr. David Kerr, Taylor Woodrow, Taywood House, 345 Ruislip Road, Southall UB1 2QX, England.
- Eircom Park model courtesy of HBG Construction Ltd., Merit House, Colindale, London NW9 5AF, England. Architects: RHWL Partnership, 77 Endell St. London WC2H 9DZ, England. Client: IMG Ireland, 5 Clare St. Dublin 2 Ireland.
- KLM model courtesy of Laing Ltd, Maxted House, 13 Maxted Road, Hemel Hempstead HP2 7DX, England.

Chapter 2. New Features

Autodesk NavisWorks Review 2009 contains many new features and enhancements.

Interface Enhancements

- .NET GUI Modernization

Up-to-date look and feel including new icons, improved control bar docking and tabbed control bars.

- Workspaces

Allow predefined default window and menu layouts, as well as full customization and sharing of layouts across multiple PCs.

- New editor for **Global Options**.

A change from complex tabs to a logical tree structure, making finding options much simpler. Also making global options sharable across multiple PCs through import and export.

Licensing Enhancements

- FlexLM Licensing

The capability of check-in / check-out of licenses, timed-out licenses to automatically return checked-out licenses after a set period of time.

- Autodesk Standalone Licensing

Support for the well-known and well-documented Autodesk standard licensing technology.

Operating System Support

- Microsoft Vista Support

Full support for Microsoft's latest operating system.

- 64-bit Support

Support for 64-bit versions of both XP and Vista.

File Formats

- 3D Text Support

Visualization of 3D text from AutoCAD and MicroStation.

- Parametric Support

Increasing cylinder accuracy, and dramatically reducing the memory footprint of file formats containing them. Of key benefit to the MicroStation exporter and DGN file reader.

- Object Animation Playback

Playback of object animations inside NWD and NWC files that have been created in Autodesk NavisWorks Manage 2009 or Autodesk NavisWorks Simulate 2009.

- File Format Updates

AutoCAD 2009 (32-bit and 64-bit)

Revit 2009

MAX 2008 and 2009

MAX 9 (32-bit and 64-bit)

VIZ 2008 and 2009

Inventor 2009

ArchiCAD 11

Faro 4.1

MicroGDS 10

Primavera v6

Part 2. Installation

This section provides step-by-step installation instructions for Autodesk NavisWorks Review 2009. In particular, you will learn how to:

- Install stand-alone versions of the program
 - Install network-licensed or multi-seat stand-alone versions of the program
 - Upgrade the program
 - Troubleshoot your installation
-

Chapter 3. Quick Start to Stand-Alone Installation

This section provides step-by-step instructions about how to install Autodesk NavisWorks Review 2009 on your system. You should read the entire Standalone Installation Guide if you have any questions that are not addressed in this Quick Start section.

For information about installing network-licensed or multi-seat stand-alone versions of the program, see the Network Installation Guide.

How to Prepare for Installation

Before you install Autodesk NavisWorks Review 2009, you must review the system requirements, understand administrative permission requirements, locate your Autodesk NavisWorks Review 2009 serial number, and close all running applications. After you complete these tasks, you can install Autodesk NavisWorks Review 2009.

How to Review System Requirements

Make sure that the computer on which you install Autodesk NavisWorks Review 2009 meets the system requirements. If your system does not meet the system requirements, many problems can occur, both within Autodesk NavisWorks Review 2009 and at the operating system level.

To review the system requirements, see “[System Requirements](#)”.

How to Understand Administrative Permission Requirements

To install Autodesk NavisWorks Review 2009, you must have administrator permissions. You do not need to have domain administrative permissions. See your system administrator for information about administrative permissions.

To run Autodesk NavisWorks Review 2009, you do not need administrator permissions. You can run the program as a limited user.

How to Install Multiple or Bundled Products

Some Autodesk packages are comprised of multiple products or are part of *multi-product bundles*. The Installation wizard for packages that are comprised of multiple products gives you the option to choose which products you want to install. During the install process, you'll be informed whether a copy of the software is already installed or you'll be warned if your system does not meet the minimum system requirements for the product. Each product is displayed on its own tabbed panel and you can individually configure them to specifically fit your needs.

If you've purchased a package that is a multi-product bundle, such as an educational or institutional package, you may have a package that includes several Autodesk products. For these bundled packages, an Installer Disk contains information for all the products in the package. The Installer Disk helps manage all of the products being installed.

How to Locate Your Autodesk NavisWorks Review 2009 Serial Number

When you are activating Autodesk NavisWorks Review 2009, you are prompted for your serial number. Your serial number is located on the outside of the product package. Make sure to have this number available before you activate the program so that you don't have to stop in the middle of the installation.

How to Avoid Data Loss During Installation

The Autodesk NavisWorks Review 2009 installation process may stop if some applications (such as Microsoft® Outlook® or virus-checking programs) are running. Close all running applications to avoid possible data loss.

How to Install and Run Autodesk NavisWorks Review 2009

To use the product, you must install the product, register and activate it, and then launch it.

How to Install Autodesk NavisWorks Review 2009

Autodesk NavisWorks Review 2009 ships on single DVD. The installation process has been streamlined by means of the Installation wizard.

1. Insert the NavisWorks DVD into your computer's media drive.

The Installation wizard launches in the language that best matches the settings on your computer.

If the Installation wizard does not start automatically, double-click `Setup.exe` at the root of the NavisWorks DVD.

2. In the NavisWorks Installation wizard, click Install Products.
3. Follow the directions on each installation page.

Note:

When you select Install without making any changes, the Installation wizard asks you to confirm you want to continue installing using the default configuration. If you select Yes, a Typical installation takes place.

For more information about installing NavisWorks, see “[Install NavisWorks](#)”.

How to Register and Activate NavisWorks

After NavisWorks is installed, you can initiate the registration process by launching the product. When you launch NavisWorks, the Product Activation wizard is displayed. Follow the directions in the Product Activation wizard to register the product.

Make sure you have your product serial number available. You cannot register and activate NavisWorks without it.

Note:

If you are upgrading from an earlier release of NavisWorks, use your new serial number when you register and activate the new release.

For more information about registering NavisWorks, see “[Register and Activate NavisWorks](#)”.

How to Launch NavisWorks

Assuming that you've followed all of the previous steps outlined in this Quick Start section, you can launch NavisWorks and start taking advantage of its new and updated features.

You can start NavisWorks in the following ways:

- **Desktop shortcut icon.** When you install NavisWorks, a NavisWorks shortcut icon is placed on your desktop. Double-click the NavisWorks icon to start NavisWorks.
- **Start menu.** On the Start menu, click Programs (Windows XP) or All Programs (Windows Vista) Autodesk > Autodesk NavisWorks Review 2009 > Autodesk NavisWorks Review 2009.
- **Location where NavisWorks is installed.** If you have administrative permissions, you can run NavisWorks in the location where you installed it. If you are a limited-rights user, you must run NavisWorks from the Start menu or from the desktop shortcut icon. If you want to create a custom shortcut, make sure that the Start In directory for the shortcut points to a directory where you have write permissions.

How to Launch NavisWorks in Another Language

To run NavisWorks in another of the supported languages, you need to add one of the language selector arguments to the desktop shortcut.

1. Right-click the NavisWorks desktop shortcut, and click **Properties** on the shortcut menu to open the **NavisWorks Properties** dialog box.
2. On the **Shortcut** tab, enter a space in the **Target** field after **..roamer.exe**, and then enter one of the following arguments:

-lang enu	Enter this for English localization
-lang deu	Enter this for German localization
-lang jpn	Enter this for Japanese localization
-lang rus	Enter this for Russian localization
-lang chs	Enter this for Chinese (PRC) localization

3. Click **OK** to save the changes.

Chapter 4. Move to NavisWorks from a Previous Release

If you have a previous version of NavisWorks installed on your system, you can install Autodesk NavisWorks Review 2009 and keep other versions of the program on the same system. This is called a *side-by-side* installation.

If you've purchased a version of Autodesk NavisWorks Review 2009, which is labeled as an *upgrade*, you are required to uninstall the previous version within 120 days of installing Autodesk NavisWorks Review 2009. See your license agreement for more information.

Chapter 5. Install NavisWorks for an Individual User

This section provides instructions for installing and activating your Autodesk products for an individual user on a stand-alone computer. For information about installing network-licensed or multi-seat stand-alone versions of the program, see the Network Installation Guide.

The NavisWorks Installation Wizard

The Autodesk NavisWorks Review 2009 Installation Wizard contains all installation-related material in one place. From the Installation wizard, you can access user documentation, install the product and supplemental tools, view support solutions, and learn about deploying your product on a network.

Note:

Autodesk NavisWorks Review 2009 ships on a single DVD. Insert the Autodesk NavisWorks Review 2009 DVD in your DVD drive to start the installation process. Follow the prompts to complete the installation. As long as the DVD is in the drive, you can access documentation by clicking the documentation link.

- **Review installation documentation before you install.** Click the Read the Documentation link to launch the Help system, and read the Welcome to Autodesk NavisWorks Review 2009 and Installation sections.
- **Install Autodesk NavisWorks Review 2009.** From the Installation wizard, click Install Products. Follow the on-screen instructions to complete the installation.

System Requirements

Before you install your product on a stand-alone computer, make sure that your computer meets the minimum system requirements. See the following table for hardware and software requirements.

Hardware and software requirements	
Hardware/Software	Requirement
Operating system	Windows®XP® Professional, SP 2 (recommended)
	Windows XP Home, and Professional, SP 2
	Windows Vista Ultimate
	Windows Vista Enterprise
	Windows Vista Business
	Windows Vista Home Premium
	Windows Vista Home Basic
Web browser	Microsoft® Internet Explorer 6.0, SP 1 (or later)
Processor	AMD®Athlon®, 3.0 GHz or faster (minimum)
	Intel®Pentium® IV, 3.0 GHz or faster (recommended)

Hardware and software requirements	
Memory (RAM)	512 MB (minimum)
	2 GB or greater (recommended)
Display card	128 meg, 1024 x 768 VGA, True Color (minimum)
	256 meg or greater - 1280 x 1024 32-bit color video display adapter, True Color (recommended)
Hard disk	Installation 800 MB
Pointing device	MS-Mouse compliant
DVD-ROM	Any speed (for installation only)
Optional hardware	Open GL®-compatible 3D video card
	Printer or plotter
	Modem or access to an Internet connection
	Network interface card

Install NavisWorks

This section contains information for installing Autodesk NavisWorks Review 2009 on a stand-alone computer. You must have administrative permissions to install NavisWorks.

Your DVD is required to install NavisWorks. Insert the Autodesk NavisWorks Review 2009 DVD to start the installation process. Follow the prompts to complete the installation.

To install NavisWorks using default values on a stand-alone computer

This is the fastest means of installing NavisWorks on your system. Only default values are used which means it is a typical installation being installed to C:\Program Files\Autodesk NavisWorks Review 2009.

1. Insert the Autodesk NavisWorks Review 2009 DVD into your computer's DVD drive.

The Autodesk NavisWorks Review 2009 Installation wizard launches in the language that best matches the settings on your computer.

If the Installation wizard does not start automatically, double-click `Setup.exe` at the root of the NavisWorks DVD.

2. In the Installation wizard, click Install Products.
3. Select the product you want to install and click Next.
4. Review the Autodesk software license agreement for your country or region. You must accept this agreement to proceed with the installation. Choose your country or region, click I Accept, and then click Next.

Note:

If you do not agree to the terms of the license and want to terminate the installation, click Cancel.

5. On the Personalize the Products page, enter your serial number and user information and click Next.

The information you enter here is permanent and is displayed in the Autodesk NavisWorks Review 2009 window (accessed by **Help > About**) on your computer. Because you can't change this information later without uninstalling the product, make sure you enter the correct information now.

6. On the Review - Configure - Install page, click Install to begin installing. Then select Yes, to continue installing using the default configuration.

The wizard does the following:

- Uses a Typical installation, which installs the most common application features.

To see which features are included in a Typical installation, refer to “[When performing a Typical installation, what gets installed?](#)”.

- Installs NavisWorks to the default install path of C:\Program Files\Autodesk NavisWorks Review 2009 .

7. On the Installation Complete page, select View the Autodesk NavisWorks Review 2009 Readme if you want to launch the Autodesk NavisWorks Review 2009 Help system.
8. Click Finish.

To install NavisWorks using using configured values on a stand-alone computer

With this installation method, you can fine-tune exactly what gets installed by using the Configure option. You can alter the installation type, the installation path and the license type.

1. Insert the Autodesk NavisWorks Review 2009 DVD into your computer's DVD drive.

The Autodesk NavisWorks Review 2009 Installation wizard launches in the language that best matches the settings on your computer.

If the Installation wizard does not start automatically, double-click `Setup.exe` at the root of the NavisWorks DVD.

2. In the Installation wizard, click Install Products.
3. Select the product you want to install and click Next.
4. Review the Autodesk software license agreement for your country or region. You must accept this agreement to proceed with the installation. Choose your country or region, click I Accept, and then click Next.

Note:

If you do not agree to the terms of the license and want to terminate the installation, click Cancel.

5. On the Personalize the Products page, enter your serial number and user information and click Next.

The information you enter here is permanent and is displayed in the Autodesk NavisWorks Review 2009 window (accessed by **Help > About**) on your computer. Because you can't change this information later without uninstalling the product, make sure you enter the correct information now.

6. On the Review - Configure - Install page, click Configure to make configuration changes such as changing the installation type, or changing the installation path.
7. On the Select License Type page, select Stand-Alone License, and then click Next.
8. On the Select the Installation Type page, you can choose to make the following configuration changes:

- **Select Features To Install** - use the check boxes to select only the features you want to install:

Autodesk NavisWorks Review 2009 - contains full set of Autodesk NavisWorks Review 2009 files.

API - contains the Component Object Model interface for customising and extending the NavisWorks functionality.

Sample RPC's - contains several Rich Photorealistic Content files for the Presenter tool.

Example NWD files - contains various feature sample files.

PDF manual - contains the Autodesk NavisWorks Review 2009 user guide in PDF format.

Note:

To view or print any files with an extension of .pdf, Adobe® Reader must be installed on your computer. If you do not have Adobe Reader, you can download the latest version by visiting <http://www.adobe.com>.

Exporter Plugins - contains various exporter plugins. These plugins enable models to be exported into native Autodesk NavisWorks Review 2009 file format from within the corresponding 3rd party software. By default, the Installation wizard will enable the exporter plugins for all 3rd party products installed on your PC.

Note:

For some plugins, you must have the 3rd party software installed on your PC to be able to select them.

-
- **Product Install Path** - use the browse button to select the drive and location where Autodesk NavisWorks Review 2009 will be installed.

If you are enabling exporter plugins for the 3rd party software, which is not installed on your PC, you must use this field to browse to the correct location in the software installation directory.

Click Next to proceed with the configuration process.

9. On the Configuration Complete page, click Configuration Complete to return to the Review - Configure - Install page. Then, click Install.
10. On the Installation Complete page, select View the Autodesk NavisWorks Review 2009 Readme if you want to launch the Autodesk NavisWorks Review 2009 Help system.
11. Click Finish.

You have successfully installed Autodesk NavisWorks Review 2009. You are now ready to register your product and start using the program. To register the product, start Autodesk NavisWorks Review 2009 and follow the on-screen instructions.

Note:

Autodesk does not recommend or support the distribution of an Autodesk product using imaging software. However, if you plan to use this method of distribution, please review the instructions detailed in Distribute the Product Using Imaging Software in the *Network Installation Guide*.

Register and Activate NavisWorks

The first time you start Autodesk NavisWorks Review 2009, the Product Activation wizard is displayed. You can either activate NavisWorks at that time or run NavisWorks and activate it later. Until you register and enter a valid activation code for Autodesk NavisWorks Review 2009, you are operating the program in trial mode and the Product Activation wizard is displayed for 30 days from the first time that you run the program. If after 30 days of running Autodesk NavisWorks Review 2009 in trial mode you have not registered and provided a valid activation code, your only option is to register and activate Autodesk NavisWorks Review 2009. You will not be able to run in trial mode after the 30 days expires. Once you register and activate Autodesk NavisWorks Review 2009, the Product Activation wizard is no longer displayed.

The fastest and most reliable way to register and activate your product is by using the Internet. Simply enter your registration information and send it to Autodesk over the Internet. Once you submit your information, registration and activation occur almost instantly.

To register and activate Autodesk NavisWorks Review 2009:

1. Click Start menu > Programs (Windows XP) or All Programs (Windows Vista) > Autodesk > Autodesk NavisWorks Review 2009 > Autodesk NavisWorks Review 2009.
2. In the Autodesk NavisWorks Review 2009 Product Activation wizard, select Activate the Product, and then click Next.

This starts the Register Today process.

3. Click Get an Activation Code.
4. Click Next and follow the on-screen instructions.

If you do not have Internet access, or if you want to use another method of registration, you can register

and activate Autodesk NavisWorks Review 2009 in one of the following ways:

- **Email.** Create an email message with your registration information and send it to Autodesk.
- **Fax or Post/Mail.** Enter your registration information, and fax or mail the information to Autodesk.

Add or Remove Features

You can add or remove Autodesk NavisWorks Review 2009 features at any time. For example, you may have chosen a Custom installation option when you first installed NavisWorks, but now you want to add features that you did not install originally. Or you may no longer need to use all of the features that were installed originally. You can add or remove features by using the Add or Remove Programs dialog box.

To add or remove features:

1. In the Control Panel, double-click Add or Remove Programs.
2. In the Add or Remove Programs dialog box, click Autodesk NavisWorks Review 2009, and then click Change/Remove in Windows XP or Uninstall/Change in Vista.

The Autodesk NavisWorks Review 2009 Installation wizard re-opens in Maintenance Mode.

3. Click Add or Remove Features.
4. On the Add/Remove Features page, select a feature to install or uninstall. The icons to the left of the selections give you an indication of the action that will be taken.



- indicates a feature that was originally not installed.



- indicates a currently installed feature or a feature that you want to add.



- indicates an originally installed feature that is chosen for removal.

Note:

If you need to revert to the Autodesk NavisWorks Review 2009 features that you selected in your original installation, click Cancel.

Click Next.

5. On the Update Autodesk NavisWorks Review 2009 Installation page, click Next.
6. On the Update Complete page, you are informed when the updates have been performed. Click Finish.

Reinstall or Repair Autodesk NavisWorks Review 2009

If you accidentally delete or alter files that are required by Autodesk NavisWorks Review 2009,

NavisWorks might not perform correctly, and you might receive error messages when you try to execute a command or find a file. You can attempt to fix this problem by reinstalling or repairing Autodesk NavisWorks Review 2009. The reinstallation or repair uses the features that were part of the installation type you chose when you initially installed the program.

To reinstall or repair Autodesk NavisWorks Review 2009:

1. In the Control Panel, double-click Add or Remove Programs.
2. In the Add or Remove Programs dialog box, click Autodesk NavisWorks Review 2009, and then click Change/Remove in Windows XP or Uninstall/Change in Vista.

The Autodesk NavisWorks Review 2009 Installation wizard re-opens in Maintenance Mode.

3. Click Repair Autodesk NavisWorks Review 2009.
4. On the Select Repair or Reinstall page, click one of the following, and then click Next:
 - **Repair My Autodesk NavisWorks Review 2009 Installation.** This option replaces all registry entries that NavisWorks initially installed and restores Autodesk NavisWorks Review 2009 to its default state.
 - **Reinstall My Autodesk NavisWorks Review 2009 Installation.** This option repairs the registry and reinstalls all files from the original installation. Use this option if the Repair My Autodesk NavisWorks Review 2009 Installation option does not solve the problem.
5. On the Repair Autodesk NavisWorks Review 2009 page, click Next to start the process.
6. On the Repair Complete page, you are informed when the repairs have been performed. Click Finish.

Uninstall Autodesk NavisWorks Review 2009

When you uninstall Autodesk NavisWorks Review 2009, all components are removed. This means that even if you've previously added or removed components, or if you've reinstalled or repaired Autodesk NavisWorks Review 2009, the uninstall removes all NavisWorks installation files from your system.

To uninstall Autodesk NavisWorks Review 2009:

1. In the Control Panel, double-click Add or Remove Programs.
2. In the Add or Remove Programs dialog box, click Autodesk NavisWorks Review 2009, and then click Change/Remove in Windows XP or Uninstall/Change in Vista.

The Autodesk NavisWorks Review 2009 Installation wizard re-opens in Maintenance Mode.

3. Click Uninstall.
4. On the Uninstall Autodesk NavisWorks Review 2009 page, click Next to remove NavisWorks from the system.

5. When informed that the product has been successfully uninstalled, click Finish.

Note:

Even though Autodesk NavisWorks Review 2009 is removed from your system, the software license remains. If you reinstall Autodesk NavisWorks Review 2009 at some future time, you will not have to register and re-activate the program.

Chapter 6. Install NavisWorks for Multiple Users

This section provides step-by-step instructions for installing network-licensed or multi-seat stand-alone versions of the Autodesk NavisWorks Review 2009.

Quick Start to Network Installation

Network deployment of this program requires careful planning and execution. If you are not familiar with network administration and deployment, you should read the entire Network Installation Guide before you attempt to deploy and administer the program over a network.

How to Prepare for Deployment

To prepare for a deployment, you need to choose an installation type and a license server model.

How to Choose an Installation Type

When you set up your deployment, you need to choose the type of installation to deploy. In the Autodesk NavisWorks Review 2009 Installation wizard, you specify one of the following installation types:

- **Network License installation.** With this type of installation, you install the program to workstations with the files and registry entries that allow the program to communicate with the Network License Manager. You also define the configuration of the Network License Manager so that the licenses can be accessed. Workstations running the program based on a network installation do not require individual activation. Licensing of this program is managed by at least one license server.

The main advantage is that you can install Autodesk NavisWorks Review 2009 on more systems than the number of licenses you have purchased (for example, purchasing 25 licenses but installing on 40 workstations). At any one time, Autodesk NavisWorks Review 2009 runs on the maximum number of systems for which you have licenses. This means you get a true floating license.

- **Multi-Seat Stand-Alone installation (Stand-Alone option).** Choose this type of installation for stand-alone installations where a single serial number is used for multiple seats. Multi-seat stand-alone installations do not rely upon a Network License Manager to manage product licenses; however, you can still use the Autodesk NavisWorks Review 2009 Installation wizard to create administrative images and create deployments. Registration and activation is more automated for multi-seat stand-alone installations. After the first activation using the multi-seat stand-alone serial number, activation occurs automatically for all workstations based on this deployment, as long as your systems are connected to the Internet.
- **Stand-Alone installation (Stand-Alone option).** Choose this type of installation for stand-alone installations where a single serial number is used for a single seat. Like a multi-seat stand-alone installation, you do not use the Network License Manager to manage product licensing, but installation, registration, and activation occurs on each workstation.

If you choose one of the Stand-Alone installation types, you can proceed to [“How to Set Up and Distribute the Program”](#).

How to Choose a License Server Model

If you chose the Network Installation option, you need to decide which license server model to use to distribute the product licenses.

Note:

If you are deploying a stand-alone or multi-seat stand-alone installation type, you do not use a license server model. Proceed to [“How to Set Up and Distribute the Program”](#).

For the network installation, use one of the following license server models:

- **Single license server model.** The Network License Manager is installed on a single server, so license management and activity is restricted to this server. A single license file represents the total number of licenses available on the server.
- **Distributed license server model.** Licenses are distributed across more than one server. A unique license file is required for each server. To create a distributed license server, you must run the Network License Manager on each server that is part of the distributed server pool.
- **Redundant license server model.** You use three servers to authenticate a single license file. One server acts as the master, while the other two provide backup if the master server fails. With this configuration, licenses continue to be monitored and issued as long as at least two servers are still functional. The license file on all three servers is the same. You must install the Network License Manager on each server.

Each of these license server models is described in detail in the *Network Licensing Guide*. It is strongly recommended that you read that guide before you deploy the program. You can find the *Network Licensing Guide* by clicking the Documentation link at the lower left corner of the Autodesk NavisWorks Review 2009 Installation wizard

How to Set Up a License Server

If you are planning to have users run the program using network licenses, you need to use the Network License Manager and the Network License Activation utility.

The Network License Manager helps you configure and manage license servers. The Network License Activation utility helps you get licenses and register them over the Internet.

How to Install the Network License Manager

The Network License Manager is used to configure and manage the license servers.

To install your Network License Manager:

1. In the Autodesk NavisWorks Review 2009 Installation wizard, click Install Tools and Utilities.
2. On the Select the Products to Install page, select Autodesk Network License Manager and click Next.
3. Review the Autodesk software license agreement for your country or region. You must accept this agreement to proceed with the installation. Choose your country or region, click I Accept, and then click Next.

Note:

If you do not agree to the terms of the license and want to terminate the installation, click Cancel.

4. On the Review - Configure - Install page, review your product selection and the current settings. If you don't want to make any changes, click Install. If you want to change the install type or installation path, click Configure.
5. On the Select the Installation Type page, accept the default installation path (C:\Program Files\Autodesk Network License Manager\) or Browse to specify a different path. If you enter a path that does not exist, a new folder is created using the name and location you provide. Click Next.

Note:

Do not install the Network License Manager on a remote drive. When you install the Network License Manager files, you must provide a path to a local drive. You must specify the drive letter; the universal naming convention (UNC) is not supported.

6. On the Configuration Complete page, click Configuration Complete to return to the confirmation page.
7. On the Review - Configure - Install page, click Install.
8. When the Installation Complete page displays, click Finish.

How to Install and Use the Network License Activation Utility

With the Network License Activation utility, you can obtain licenses over the Internet, which saves time and effort in setting up a network-licensed version of the program. In addition, you can register your product, get automated support by email if you cannot obtain a license over the Internet, and save and migrate license files automatically.

To install your Network License Activation utility:

1. In the Autodesk NavisWorks Review 2009 Installation wizard, click Install Tools and Utilities.
2. On the Select the Products to Install page, select Autodesk Network License Activation Utility and click Next.
3. Review the Autodesk software license agreement for your country or region. You must accept this agreement to proceed with the installation. Choose your country or region, click I Accept, and then click Next.

Note:

If you do not agree to the terms of the license and want to terminate the installation, click Cancel.

4. On the Review - Configure - Install page, review your product selection and the current settings. If you don't want to make any changes, click Install. If you want to change the install type or installation path, click Configure.

5. On the Select the Installation Type page, either accept the default installation path (C:\Program Files\Autodesk Network License Manager\Network License Activation Utility\enu\) or Browse to specify a different path. If you enter a path that does not exist, a new folder is created using the name and location you provide. Click Next.
6. On the Configuration Complete page, click Configuration Complete to return to the confirmation page.
7. On the Review - Configure - Install page, click Install.
8. When the Installation Complete page displays, click Finish.

To use your Network License Activation utility:

1. Click Start menu > Programs (Windows XP) or All Programs (Windows Vista) > Autodesk > Network License Manager > Autodesk NavisWorks Review 2009 Network License Activation Utility.
2. On the Obtain a Network License page, review how this utility works and the requirements for using it, and then click Next.
3. On the Server Information page, enter the product serial number.

Note:

If you are modifying an existing license file or obtaining a new license for an existing product, your previously entered information might be displayed. Make sure that the serial number that is displayed is the one you want to license. If it is not, enter the correct product serial number.

4. In the License Server Model section, click a license server model. For more information about each license server model, click the ? button.
 5. In the Server Host Name box, enter a server host name or click the [...] button to locate the name of each server you plan to use.
 6. In the Host ID box, for each server host name you entered in the previous step, click Lookup to have the utility automatically locate the host ID for the server, or enter the host ID manually.
-

Note:

If your server has more than one network adapter, select the one that corresponds to a physical network adapter. To determine which adapters are physical, enter **ipconfig /all** at a Windows command prompt and view the Description field above each physical address. If there is more than one physical network adapter, you can use any one of them, as long as it was listed when you ran ipconfig /all. Logical devices such as VPN adapters, PPP adapters, and modems may be listed but are not usable for licensing.

7. If you chose Distributed Server in the License Server Model section, the Seats box is displayed. In the Seats box, enter the number of seats for each license server, and then click Next.
8. On the Confirm Server Information page, review the server information you entered, and click Next.
9. If the Register and License Your Autodesk Product page is displayed, do all of the following, and

then click Next.

In the This Product Is To Be Registered To option, select Company or Individual.

In the Select Country or Region section, select your country or region of residence.

In the Is This an Upgrade section, select Yes or No.

10. If the Registration Information page is displayed, enter your registration information, and then click Next.
11. If the Confirm Information page is displayed, review your registration information, and then click Next.
12. If the Connecting page is displayed, click Next to connect to the Internet to obtain your network license.
13. On the Licenses Received page, in the Save License File for *[computer name]* dialog box, enter the location where you want to save your license file, or click Browse to navigate to the location.
14. If you have an existing license file from another Autodesk product, select one of the following options:
 - **Insert the New License Information Into It.** The new license information is added into the existing license file.
 - **Overwrite the Existing License File.** The entire contents of the existing license file is replaced with the new license information. Select this option only if you no longer require any part of the existing license file contents.
15. Click Next.
16. On the License Activation Successful page, click Print to save a printed copy of the license information, or click Done to complete the transaction and exit the Network Activation utility.

How to Configure Your License Server

You configure a license server so that you can manage the Autodesk product licenses you received when you ran the Network License Activation utility. Configure the license server with the *lmtools.exe* utility.

You should be logged in with Administrator rights when working with the LMTOOLS utility.

To configure your license server:

1. Do one of the following:
 - Click Start menu > Programs (Windows XP) or All Programs (Windows Vista) > Autodesk > Network License Manager > LMTOOLS.
 - Right-click the LMTOOLS icon (Windows Vista) on the desktop and click Run As Administrator.

2. In the Lmtools program, on the Service/License File tab, select the Configure Using Services option.
3. Click the Config Services tab.
4. On the Config Services tab, in the Service Name list, select a service name or do one of the following:
 - If a service name is selected, verify that it is the one you want to use to manage licenses.
 - If no service name exists, enter the service name you want to use to manage licenses.

Note:

If you have more than one software vendor using FLEXlm® for license management, the Service Name list contains more than one option.

5. In the Path to Lmgrd.exe File box, enter the path to the Network License Manager daemon (*lmgrd.exe*), or click Browse to locate the file.

By default, this daemon is installed in the \Program Files\Autodesk Network License Manager folder.
6. In the Path to the License File box, enter the path to your license file, or click Browse to locate the file.
7. In the Path to the Debug Log File box, enter a path to create a debug log, or click Browse to locate an existing log file.
8. To run *lmgrd.exe* as a service, select Use Services.
9. To automatically start *lmgrd.exe* when the system starts, select Start Server at Power Up.
10. Click Save Service to save the new configuration under the service name you selected on the Config Services tab. Then click Yes.
11. Click the Start/Stop/Reread tab.
12. On the Start/Stop/Reread tab, do one of the following:
 - If a service has not yet been defined for Autodesk, click Start Server to start the license server.
 - If a service for Autodesk is already defined and running, click ReRead to refresh the Network License Manager with any changes made to the license file or Options file.

The license server starts running and is ready to respond to client requests.

13. Close *lmttools.exe*.

How to Set Up and Distribute the Program

Once you have prepared for deployment and you have used the Network License Manager and the Network License Activation utility, you are ready to set up and distribute this program by using the

Autodesk NavisWorks Review 2009 Installation wizard and choosing a deployment method.

How to Create a Network Share

A network share is an installation folder that you make available to users' computers on a network. You point users to this location to install the program. Create a network share that will be used by the Autodesk NavisWorks Review 2009 Installation wizard during the creation of a client deployment.

You must have Full Control permissions set for your shared folder when you are creating your deployment images. Read permissions are necessary to access the network share and administrative permissions on the workstation where the program is deployed.

To create your network share:

1. On the desktop of a network server, create a folder named *Autodesk*.
2. Right-click the *Autodesk* folder and click Share and Security (or Sharing).
3. In the *[folder name]* Properties dialog box, Sharing tab, select Share This Folder.
4. Specify a Share Name, such as *Autodesk* or *MyDeployments*, if necessary.
5. Click the Permissions button. In the Permissions dialog box make sure Full Control is active. Click OK.

In Vista, right-click the *Autodesk* folder and then click Share. In the Properties dialog box select Sharing and then Advanced Sharing to share the folder. Click the Permissions button to make sure Full Control is active. Click OK.

These steps are important when creating your deployment images.

6. Click OK or Close to close the Properties dialog box.
7. For each product you plan to install, create a subfolder in the *Autodesk* folder. Name each folder with the pertinent product name.

How to Use the Installation Wizard to Set Up a Deployment

You can create a deployment directly from the Autodesk NavisWorks Review 2009 Installation wizard. From the deployment, users can install the program on their computers.

Note:

The following procedure illustrates just one of the ways you can set up a deployment. This procedure details a single-server network deployment with a Typical client setup type and no customizations. For further information about setting up deployments, see Use the Installation Wizard to Set Up a Deployment.

To use the Installation wizard to create a default deployment:

1. In the Autodesk NavisWorks Review 2009 Installation wizard, click Create Deployments.
2. On the Begin Deployment page, you need to specify the following: administrative image location and deployment name.

In the administrative image field, enter an existing shared network location where you want to create an administrative image, or click the Browse button to navigate to a location where there is a shared network location. Users install the program from this location. If you do not know how to create a network share, see [“How to Create a Network Share”](#).

In the deployment name field, enter the new deployment's name. The name you enter here is the name of the shortcut your users will access to install the product.

Click Next.

3. On the Select the Products to Include in the Deployment page, choose the products you want to deploy and click Next.
4. Review the Autodesk software license agreement for your country or region. You must accept this agreement to proceed with the installation. Choose your country or region, click I Accept, and then click Next.

Note:

If you do not agree to the terms of the license and want to terminate the installation, click Cancel.

5. On the Product and User Information page, enter your serial number and user information and click Next.

Note:

The information you enter here is permanent and is displayed in the Autodesk NavisWorks Review 2009 window (accessed by Help > About) on your computer. Because you can't change this information later without uninstalling the product, make sure you enter the correct information now.

6. On the General Deployment Settings page, choose if you want the deployment to create a network log and/or a client log, run the client installation in silent mode, and if you want users to participate in the Customer Involvement program.

When you choose to create a network log file, you also have to specify where the log file is created by entering either a valid UNC (universal naming convention) path or hard-coded path on your network. The network log file is optional.

Note:

The folder where the network log resides must be a shared folder where users who install the program have Change permissions. Otherwise, successes or failures for user installations cannot be written to the log file.

Choose whether you want a client log file created.

If you want to prevent users from changing installation settings when they install, select Silent mode.

If you choose participation in the Customer Involvement program, Autodesk sends helpful information about the product.

Click Next.

7. On the Review - Configure - Create Deployment page, click Create Deployment.

By clicking Create Deployment, an administrative image is created in the shared folder using the deployment options listed in the Current Settings field.

8. On the Deployment Complete page, click Finish.

How to Deploy This Program

You can choose from several methods of deploying the program. Network sharing is the default method.

- **Network Share.** Users launch the program with the shortcut icon that you created with the Installation wizard, in step 3 of the procedure How to Use the Installation Wizard to Set Up a Deployment. The program is installed on users' local computers, and a product icon appears on their desktop.

Note:

Users must have Read permissions to access the network share and administrative permissions on the workstation where this program is installed.

- **Scripting.** Installation scripts are most useful for stand-alone installation of programs on computers that are connected to a network. Scripts are also useful for installing service packs, extensions, and object enablers on a network.
- **Group Policy Objects (GPOs).** With group policy objects, this program can be advertised to any Windows XP or Windows Vista computer that is part of a Windows 2003 Server Active Directory environment.

Autodesk products are designed to be installed on a computer so that any user who logs on to the computer can run the software. If you attempt to assign this program for a specific user rather than a computer, you may encounter problems when a second specified user tries to install or uninstall a copy of the program.

- **Imaging Software.** You can use imaging software, such as Norton Ghost, to create a master image to distribute Autodesk products. Once created, the master image is then replicated to other computers throughout your facility.

Care needs to be taken since the use of imaging software can result in conflicts with the product licensing, incomplete installations, and problems with activation.

System Requirements for a Deployment

This section contains the system requirements for the location of the administrative image that you create, the network license server, and the client workstation.

Before you begin installing the program on a network, make sure that your servers and client workstations

meet the minimum recommended hardware and software requirements for a deployment.

See the following tables for administrative image, license server, and client workstation system requirements.

Hardware and software requirements for the location of the administrative image	
Hardware/Software	Requirement
Hard disk	1.5 GB (recommended)

Hardware and software requirements for the the network license server	
Hardware/Software	Requirement
Operating system	Windows Vista 32-bit
	Windows XP 32-bit
	Windows 2003 Server Edition
Computer/processor	AMD®Athlon®, 3.0 GHz or faster (minimum)
	Intel®Pentium® IV, 3.0 GHz or faster (recommended)
Network interface card	Compatible with existing Ethernet network infrastructure
Communication protocol	TCP/IP

Hardware and software requirements for client machine	
Hardware/Software	Requirement
Operating system	Windows®XP® Professional, SP 2 (recommended)
	Windows XP Home, and Professional, SP 2
	Windows Vista Ultimate
	Windows Vista Enterprise
	Windows Vista Business
	Windows Vista Home Premium
	Windows Vista Home Basic
Web browser	Microsoft® Internet Explorer 6.0, SP 1 (or later)
Processor	AMD®Athlon®, 3.0 GHz or faster (minimum)
	Intel®Pentium® IV, 3.0 GHz or faster (recommended)
Memory (RAM)	512 MB (minimum)
	2 GB or greater (recommended)
Display card	128 meg, 1024 x 768 VGA, True Color (minimum)
	256 meg or greater - 1280 x 1024 32-bit color video display adapter, True Color (recommended)
Hard disk	Installation 800 MB
Pointing device	MS-Mouse compliant
DVD-ROM	Any speed (for installation only)

Hardware and software requirements for client machine	
Optional hardware	Open GL®-compatible 3D video card
	Printer or plotter
	Modem or access to an Internet connection
	Network interface card

Creating Network Deployments

In this section, you'll find more detailed information about using the Autodesk NavisWorks Review 2009 Installation wizard to create or modify deployments.

Preliminary Tasks for a Network Deployment

Installing this program on a network requires careful planning and execution. The deployment checklist gives you a quick summary of the type of information you should be familiar with during your deployments.

Deployment Checklist	
<input type="checkbox"/>	You have reviewed the system requirements. You must make sure that your network, servers, and client workstations meet the system requirements. See "System Requirements for a Deployment" .
<input type="checkbox"/>	You have closed all other programs and disabled anti-virus software. See "Minimize Chances of Installation Failure" .
<input type="checkbox"/>	You have identified where deployments will reside such as a shared folder for each program you plan to deploy. See "Create Shared Folders for Your Deployments" .
<input type="checkbox"/>	You have installed and activated any supporting tools and utilities. See "Install and Activate Tools and Utilities" .
<input type="checkbox"/>	You have specified whether you want to create log files that contain deployment and installation data, run silent mode, and participate in the Customer Involvement Program. See "Specify Log File Locations" .
<input type="checkbox"/>	You understand the type of license you've purchased. If you plan a network license deployment, you should also be familiar with the type of license server model you want to use and the license server names. See "Select a License Type (optional)" .
<input type="checkbox"/>	You know which features you want to include with the installation. See "Select the Installation Type (optional)" .
<input type="checkbox"/>	You know how you're going to personalize the programs during registration. Using consistent registration data is very important. See "Register the Product" .

When you have completed these tasks, you are ready to create a deployment from the Installation wizard.

Minimize Chances of Installation Failure

The Autodesk NavisWorks Review 2009 installation process may stop if some applications, such as Microsoft Outlook or virus checking programs, are running when you are creating a deployment. Close all running applications and temporarily disable virus checking utilities.

Create Shared Folders for Your Deployments

Shared folders are required for both network license and multi-seat stand-alone methods of installation. The shared folder (*network share*) is created before you run the Installation wizard and is where product deployments are stored.

It is recommended that you name the network share folder *Deployments* on the desktop of the system where you want deployments stored. You can then add subfolders inside the shared *Deployments* folder that clearly convey the name of product you plan to deploy. This is also beneficial if you plan to deploy multiple products.

Any subfolders that are placed inside a shared folder are automatically shared.

Note:

You must have Full Control permissions set for your shared folder when you are creating your deployment images. Read permissions are necessary to access the network share and administrative permissions on the workstation where the program is deployed.

To create a shared folder:

1. On a network server, create a folder named *Deployments*.
2. Right-click the *Deployments* folder and click Share and Security (or Sharing).

In Vista, right-click the *Deployments* folder and then click Share. Click the Permissions button to make sure Full Control is active.
3. In the *[folder name]* Properties dialog box, Sharing tab, select Share This Folder.

In Vista, in the Properties dialog box, select Sharing and then Advanced Sharing.
4. Specify a Share Name, such as *MyDeployments*, if necessary.
5. Click the Permissions button. In the Permissions dialog box make sure Full Control is active. Click OK.
6. Click OK or Close to close the Properties dialog box.
7. For each product you plan to install, create a subfolder in the *Deployments* folder. Name each folder with the pertinent product name.

Install and Activate Tools and Utilities

Several supporting tools and utilities are necessary if you plan to have users run the programs with network licenses. Ancillary programs you might install include:

- Network License Manager
- Network License Activation Utility
- SAMreport Lite

Refer to the *Network Licensing Guide* for detailed information about how to set up your license servers. The *Network Licensing Guide* is available on the Documentation link of the Autodesk NavisWorks Review 2009 Installation wizard.

Use the Installation Wizard to Set Up a Deployment

The deployment process is initiated from the Installation wizard. Deployments are created from which users can install the program on their computers. You make choices during the deployment process to create various client deployment images and deployment types that meet user requirements and company needs.

Note:

Because the deployment process provides you with numerous options for creating and customizing your deployments, there are many deployment pages you need to complete and choices you must make. You should set aside ample time to complete the deployment process in one sitting.

Start the Deployment Process

Once you start the Installation wizard, you initiate the deployment process to set up a deployment.

To start the deployment process:

- In the Autodesk NavisWorks Review 2009 Installation wizard, click Create Deployments.

Create a Deployment

A deployment contains a Microsoft Transform (MST) file that modifies the default behavior of the installation program. As you begin a deployment, you need to select the location of your Administrative image, and a deployment name.

To create a deployment:

1. In the Installation wizard, click Create Deployments.
2. On the Begin Deployment page, enter the location of your Administrative image or click the Browse button to locate your image. Enter your deployment's name.

Note:

The deployment location should be a shared network folder. To create a shared folder, see [“Create Shared Folders for Your Deployments”](#).

3. On the Select the Products to Include in the Deployment page, select the products and click Next.
 4. Review the Autodesk software license agreement for your country or region. You must accept this agreement to proceed with the deployment. Choose your country or region, click I Accept, and then click Next.
-

Note:

If you do not agree to the terms of the license and want to terminate the installation, click Cancel.

5. On the Product and User Information page, enter the serial number and required personalization data. Click Next.
6. On the General Deployment Settings page, choose whether or not you want to create a network log and its location, and a client log. You can also run the client's installation in silent mode and if you want users to participate in the Customer Involvement Program. Click Next.
7. If you do not want to make configuration changes on the Review - Configure - Install page, click Create Deployment. Then select Yes, to continue installing using the default configuration.
8. Select the Register products online link to register and activate your product, or click Finish and register and activate later.

Enter Product and User Information

The Product and User Information page is used to personalize the program for your company. The information you enter here is permanent and is displayed in the About Autodesk NavisWorks Review 2009 window (accessed by Help > About) on all workstations that install your deployment. Because you can't change this information later without uninstalling, make sure you enter the correct information now.

You must also enter your product serial number in order to run the product. The product serial number is located on the product packaging. The serial number must contain a three-digit prefix followed by an eight-digit number.

To enter your serial number and personal information:

1. On the Product and User Information page, enter your product serial number and the required personalization data.
-

Note:

Although it is required that you enter information in each box on this page, you can enter any information that you want to convey to users who install the deployment.

2. Click Next.
-

Specify Log File Locations

The program has two types of log files with which you can monitor information about deployments and installations.

- **Network log.** The network log file keeps a record of all workstations that run the deployment. On the General Deployment Settings page of the deployment process, you choose whether or not to create a network log file. The log lists the user name, workstation name, and the status of the installation. Refer to this file for status information and details about problems that users encountered during installation (for example, low disk space or inadequate permissions). The network log is named with the same name you chose for your deployment. You can specify where the log file is created by entering either a valid UNC (universal naming convention) path or hard-coded path on your network, for example `\\MyComputer\Autodesk\Autodesk NavisWorks Review 2009`.

Note:

The folder where the network log resides must be a shared folder where users who install the program have Change permissions. Otherwise, successes or failures for user installations cannot be written to the log file.

- **Client log.** The client log contains detailed installation information for each workstation. This information may be useful in diagnosing installation problems. The client log is located in the `\Temp` directory of each client workstation.

To specify a log file location:

1. While creating a deployment, on the General Deployment Settings page, select the check box next to the Create Network Log box. Enter the name of the folder where you want the network log to be located.
2. If you want to create a client log, select the Create Client Log option.
3. Click Next.

What Is Silent Mode?

When silent mode is active and a user initiates the deployment, the installation proceeds without any explicit user input. No dialog boxes are presented that require interaction from the user. This includes all error and warning dialog boxes. Check the log file for errors that may occur in the event of installation problems.

Customer Involvement Program (CIP)

If you choose to have your clients participate in the Customer Involvement Program, Autodesk NavisWorks Review 2009 will automatically send Autodesk information about system configuration, what features you use most, any problems that you encounter, and other information helpful to the future direction of the product.

Select a License Type (optional)

When you set up your deployment, you choose the type of installation to deploy based on the type of software license you purchased: stand-alone or network. You also select the network license server model you want to use to distribute product licenses.

Specify the license type to use during deployment

Stand-Alone license (a single serial number for a single seat). For a stand-alone license, you install, register, and activate the program on each workstation.

Network license. With this type of installation, you install the program to workstations with the files and registry entries that allow the program to communicate with the Network License Manager. You also define the configuration of the Network License Manager so that the licenses can be accessed. Workstations running the program based on a network installation do not require individual activation. Licensing of this program is managed by at least one license server.

To deploy a stand-alone license:

1. While creating a deployment, on the Select the License Type page, select Stand-alone license.
2. Click Next.

Specify the license server model during deployment

If you choose the Network license option, you need to decide which license server model to use to distribute your product licenses - single, distributed or redundant license server model.

If you are deploying a stand-alone or multi-seat stand-alone installation type, you do not use a license server model. For more information on server models, see [“How to Choose a License Server Model”](#).

To deploy a network license using a single license server model:

1. While creating a deployment, on the Select the License Type page, select the Network License option.
2. Select Single License Server as the license server model you want to use with the Network License Manager.

If you have already used the Network License Manager to create a license server model, you must select the same license server model in this step. If you have not yet used the Network License Manager to create a license server model, make sure that you select the same settings in the Network License Manager that you choose here.

For detailed information about license server models, see “License Server Models” in the *Network Licensing Guide*, located on the Documentation link of the Installation wizard.

3. Enter the server name of the server that will run the Network License Manager, or click the Browse button to locate the server. Click Next.

To deploy a network license using a distributed license server model:

1. While creating a deployment, on the Select the License Type page, select the Network License option.
2. Select Distributed License Server as the license server model you want to use with the Network License Manager.

If you have already used the Network License Manager to create a license server model, you must select the same license server model in this step. If you have not yet used the Network License Manager to create a license server model, make sure that you select the same settings in the Network License Manager that you choose here.

For detailed information about license server models, see “License Server Models” in the *Network Licensing Guide*, located on the Documentation link of the Installation wizard.

3. Enter the name of one of the servers that will run the Network License Manager, or click the Browse button to locate the server. Click Add to add the server to the Server Pool. Once all the servers are added to the Server Pool list, use the Move Up and Move Down buttons to arrange the servers in the order you want them to be searched by a user's workstation. You must enter at least two servers. Click Next.

To deploy a network license using a redundant license server model:

1. While creating a deployment, on the Select the License Type page, select the Network License option.
2. Select Redundant License Server as the license server model you want to use with the Network License Manager.

If you have already used the Network License Manager to create a license server model, you must select the same license server model in this step. If you have not yet used the Network License Manager to create a license server model, make sure that you select the same settings in the Network License Manager that you choose here.

For detailed information about license server models, see “License Server Models” in the *Network Licensing Guide*, located on the Documentation link of the Installation wizard.

3. In the First Server Name field, enter a server name of one server that will run the Network License Manager, or click the Browse button to locate the server. Enter the server names for the remaining two servers that you will use in the redundant server pool. Click Next.

Note:

If you are not sure how to obtain the server host name, see “Plan Your License Server Configuration” in the *Network Licensing Guide*, located on the Documentation link of the Installation wizard.

Select the Installation Type (optional)

As part of making your deployment choices, you can choose which features are included with the installation, and specify where the product is installed on each workstation.

You choose the location where program files are installed on the client workstation in the Product Install Path. To help decide where the product is installed, a chart of drives and disk space is provided.

To deploy a custom installation and specify a product location:

1. During the deployment, on the Select the Installation Type page select the features that you want to install in the Select Features to Install list.

Your choices are as follows:

Autodesk NavisWorks Review 2009	Contains full set of Autodesk NavisWorks Review 2009 files
API	Contains the Component Object Model interface for customising and extending the NavisWorks functionality
Sample RPC's	Contains several Rich Photorealistic Content files for the Presenter tool
Example NWD files	Contains various feature sample files
PDF manual	Contains the Autodesk NavisWorks Review 2009 user guide in PDF format.
Exporter Plugins	Currently, you cannot change any of the settings. By default, the exporter plugins for all 3rd party products installed on a client PC will be automatically enabled.

2. Enter the path on the client workstation where you want to install the program, for example `C:\Program Files\Autodesk NavisWorks Review 2009`, or click the Browse button to specify the install location.
3. Click Next.

Final Review and Complete Setup

To complete your deployment setup, confirm the settings you selected.

To confirm and complete the setup of a network deployment:

1. After making all your deployment settings, on the Review - Configure - Create Deployments page, scroll the list of current settings and verify your installation selections.
2. If you want to change any selections you made for the deployment, click the Configure button.

3. If you want a hardcopy of the installation information displayed on this page, click the Print button.
4. If you are ready to complete the deployment, click Create Deployment.
5. On the Deployment Complete page, click Finish.

To confirm and complete the setup of a multi-seat stand-alone deployment:

1. After making all your deployment settings, on the Review - Configure - Create Deployments page, scroll the list of current settings and verify your installation selections.
2. If you want to change any selections you made for the deployment, click the Configure button.
3. If you want a hardcopy of the installation information displayed on this page, click the Print button.
4. If you are ready to complete the deployment, click Create Deployment.
5. On the Deployment Complete page, click Register Products Online.
6. Registration at this stage ensures that consistent data is being used to streamline product activation. When a user installs from this deployment and runs the product, registration data is automatically referenced and the product gets activated. See ["Register the Product"](#).
7. Click Finish.

You have created an Autodesk product deployment with precise options that are specific to your group of users. You can now inform those using this deployment where the administrative image is located so that they can install the program.

Register the Product

It is very important that the registration data (for example, your company name and contact information) you supply when registering and activating your products is consistent across all Autodesk products that you install. If you enter this data incorrectly or inconsistently, you can run into activation problems.

The way products are registered depends upon the type of license you selected while creating the deployment. In order to receive an activation code, your product must be registered.

To register a network licensed deployment:

1. On the Start menu (Windows), click All Programs (or Programs) > Autodesk > Network License Manager > Autodesk NavisWorks Review 2009 Network License Activation Utility.
2. On the Obtain a Network License page, review how this utility works and the requirements for using it, and then click Next.
3. Follow the on-screen instructions to complete the registration and activation.

To register a multi-seat stand-alone licensed deployment:

1. On the Deployment Complete page, click Register Products Online.

The Register Today page is displayed. You complete Register Today at this point so that all users have the same default registration information.

2. In the Register Today wizard, follow the on-screen instructions to complete the registration.

Note:

This process only registers the product. If users are connected to the Internet, activation occurs automatically when the product is started.

Modify a Deployment (optional)

After a deployment is created, it may be necessary to modify the deployment for some client workstations. You can apply a patch or select various custom files that are not part of the base administrative image. You can also perform modifications such as changing the installation directory from drive C to drive D.

To modify a deployment:

1. Open the shared network folder where you originally chose to place your product deployment.
2. In the Tools folder, double-click the Create and Modify a Deployment shortcut.

This re-opens the Installation wizard.

3. Click through the deployment pages and make the necessary changes.
4. After all the modifications have been made, click Create Deployment.

Point Users to the Administrative Image

When you have completed the deployment process, you are ready to have users install the newly created or modified deployment. You need to notify your users of the shortcut that was created in the administrative image. The shortcut is the same name that you chose in ["Create a Deployment"](#).

To point users to the administrative image:

- The simplest method of notifying users how to install the deployment is to email them with instructions about using the shortcut. At a minimum, the instructions need to include the location of the deployment and instructions about double-clicking the shortcut to the deployment.

Uninstall the Program

When you uninstall Autodesk NavisWorks Review 2009, all components are removed in the process. This means that even if you have previously added or removed components, or if you have reinstalled or repaired the program, uninstalling removes all program installation files from your system.

Note:

If you plan to modify an administrative image at a later date (for example, by adding a patch to it), do not remove that image.

To uninstall the program:

1. In the Windows Control Panel, click Add or Remove Programs.
2. In the Add/Remove Programs window, select Autodesk NavisWorks Review 2009, and then click Change/Remove.
3. When the Installation wizard opens, choose Uninstall Autodesk NavisWorks Review 2009.
4. On the Uninstall Autodesk NavisWorks Review 2009 page, click Next to remove NavisWorks from the system.
5. When informed that the product has been successfully uninstalled, click Finish.

Chapter 7. Installation Troubleshooting

This section outlines common issues and their solutions that may arise while performing a general installation of your product.

What are the minimum system requirements?

Before you install your product on a stand-alone computer, make sure that your computer meets the minimum system requirements.

Hardware and software requirements	
Hardware/Software	Requirement
Operating system	Windows®XP® Professional, SP 2 (recommended)
	Windows XP Home, and Professional, SP 2
	Windows Vista Ultimate
	Windows Vista Enterprise
	Windows Vista Business
	Windows Vista Home Premium
	Windows Vista Home Basic
Web browser	Microsoft® Internet Explorer 6.0, SP 1 (or later)
Processor	AMD®Athlon®, 3.0 GHz or faster (minimum)
	Intel®Pentium® IV, 3.0 GHz or faster (recommended)
Memory (RAM)	512 MB (minimum)
	2 GB or greater (recommended)
Display card	128 meg, 1024 x 768 VGA, True Color (minimum)
	256 meg or greater - 1280 x 1024 32-bit color video display adapter, True Color (recommended)
Hard disk	Installation 800 MB
Pointing device	MS-Mouse compliant
DVD-ROM	Any speed (for installation only)
Optional hardware	Open GL®-compatible 3D video card
	Printer or plotter
	Modem or access to an Internet connection
	Network interface card

How can I check my graphics card driver to see if it needs to be updated?

It is recommended that you verify and update your graphics card driver to optimize your program. Use the following procedure to identify your current graphics card driver.

To identify your graphics card driver:

1. Start Autodesk NavisWorks Review 2009.
2. Click Help > System Info.

The Autodesk NavisWorks Review 2009 information dialog box opens.

3. Review the information about your system including the graphics card driver and driver version, and click OK to close the dialog.

What is the difference between a stand-alone license and a network license?

Stand-alone licensed products are registered and activated to an individual workstation. While the software can be installed on multiple systems in your facility, the license only allows one system to be operational. The Portable License Utility can be used if a license needs to be transferred to another system. If you need to run more systems, you need to purchase more stand-alone licensed products, or consider converting to network licenses.

Network licensed products rely on the Network License Manager to keep track of software licenses. The software can be installed and run on multiple systems, up to the maximum number of licenses you've purchased. The Network License Manager "checks out" licenses until they are all in use. No further systems can run the program until a license is "checked in." If you need to run more systems, you can purchase additional licenses for the Network License Manager to maintain.

What is the benefit to using a network licensed version of the software?

Network licensed products are recommended for large drafting/design facilities, classrooms, and lab environments. The main advantage is that you can install products on more systems than the number of licenses you have purchased (for example, purchasing 25 licenses but installing on 40 workstations). At any one time, products will run on the maximum number of systems for which you have licenses. This means you get a true floating license. If software needs to be run on more systems, additional licenses can be purchased.

Registration and activation occurs only once and the licenses are maintained on your Network License Server.

When performing a Typical installation, what gets installed?

A Typical installation includes the following features:

Autodesk NavisWorks Review 2009	Contains full set of Autodesk NavisWorks Review 2009 files
API	Contains the Component Object Model interface for customising and extending the NavisWorks

	functionality
Sample RPC's	Contains several Rich Photorealistic Content files for the Presenter tool
Example NWD files	Contains various feature sample files
PDF manual	Contains the Autodesk NavisWorks Review 2009 user guide in PDF format.

Additionally, the Installation wizard will automatically enable the exporter plugins for all 3rd party products installed on your PC.

Where are my product manuals?

All documentation created for Autodesk products are built in two different formats: PDF and CHM.

CHM files are made available during installation; click the Documentation link in the Installation wizard. To access CHM files after the product is installed, use the Help system in the product.

PDF files are available after the product is installed; they are located in the \Autodesk NavisWorks Review 2009\Manuals folder.

CHM files are installed to the \Autodesk NavisWorks Review 2009 folder.

Deployment Issues

This section outlines common issues and their solutions with regards to software deployments.

Is there a checklist I can refer to when performing a deployment?

The *Network Installation Guide* contains a complete section that describes preliminary actions and the entire deployment process. See "[Preliminary Tasks for a Network Deployment](#)".

Where should deployments be located?

Shared folders are required for both network license and multi-seat stand-alone methods of installation. The shared folder (*network share*) is created before you run the Installation wizard and is where product deployments are stored. It is recommended that you name the network share folder *Deployments* on the desktop of the system where you want deployments stored. You can then add subfolders inside the shared *Deployments* folder that clearly convey the names of products you plan to deploy.

Any subfolders that are placed inside a shared folder are automatically shared.

Note:

You must have Full Control permissions set for your shared folder when you are creating your deployment images. Read permissions are necessary to access the network share and administrative permissions on the workstation where the program is deployed.

Where can I check if service packs are available for my software?

To find out if a patch or Service Pack is available for your product, visit the Autodesk Product Support page at <http://support.autodesk.com>.

Networking Issues

This section outlines common issues and their solutions with regards to performing a network installation or configuring your network license servers.

Where do I find my server name?

When installing a network licensed product, you must specify the name of the server that will run the Network License Manager. If you don't know the server name, you can quickly find it by opening a Windows command prompt on the system that will be the Network License Manager. At the prompt, enter *ipconfig /all* and note the Host Name entry.

If I choose to create a log file, what kind of information does the log file contain?

There are two types of log files that can be generated that monitor information about deployments and installations.

The Network log file keeps a record of all workstations that run the deployment. The log lists the user name, workstation name, and the status of the installation. Refer to this file for status information and details about problems that users may have encountered during installation.

The Client log file contains detailed installation information for each workstation. This information may be useful in diagnosing installation problems. The client log is located in the `\Temp` directory of each client workstation.

Maintenance Issues

This section outlines common issues and their solutions with regards to adding and removing features, reinstalling or repairing your installation, and uninstalling products.

Is it possible to change the installation folder when adding or removing features?

Once your product is installed, you cannot change the installation path from the Add/Remove Features page. Changing the path while adding features results in program corruption, so it is not an option.

When should I reinstall the product instead of a repair?

You should reinstall your product if you accidentally delete or alter files that are required by the program. Missing or altered files adversely affect the performance of your product and cause error messages when you try to execute a command or find a file.

If an attempt to repair an installation fails, reinstalling is the next best option.

Do I need my original disk to reinstall my software?

When performing a reinstall of the product, you do not need to have the original DVD on hand. Installation data is cached locally on your drive and that data is reused when reinstalling.

When I uninstall my software, what files are left on my system?

If you uninstall the product, some files remain on your system such as files you created or edited.

Your license file also stays on your workstation when you uninstall your product. If you reinstall on the same workstation, the license information remains valid and you do not have to reactivate the product.

Part 3. Basic NavisWorks Functionality

The core functionality of Autodesk NavisWorks Review 2009 enables 3D CAD file aggregation and real-time navigation of digital projects of any size, and provides a comprehensive project review toolkit. In this section, you will learn how to:

- Work with files
 - Navigate and explore your designs
 - Take and publish model snapshots
 - Create visualizations and real-time walkthroughs
 - Review your design
 - Customize NavisWorks
-

Chapter 8. Overview

The basis of Autodesk NavisWorks Review 2009 is its ability to walk through any size model in real time. NavisWorks guarantees a user-defined frame rate using a unique algorithm which automatically calculates which items to render first during navigation, based on the size of items and distance from the viewpoint. Items which NavisWorks does not have time to render are, therefore, sacrificed or "dropped out" in the name of interactivity. These items are, of course, rendered when navigation ceases. The amount of drop-out depends on several factors including: hardware (in particular graphics card and driver performance), as well as the size of the NavisWorks navigation window and the size of the model. If you wish to reduce drop-out during navigation, you have the option to reduce frame rate and, therefore, trade it off against drop-out.

When working with truly large "supermodels" in NavisWorks, you will require a sufficient amount of RAM to load and review the data. NavisWorks employs JetStream technology which optimizes the usage of the available RAM. Before running out of memory, NavisWorks will page unnecessary data to the hard disk, freeing up space for loading to continue. JetStream technology also enables the user to commence navigating the supermodel, before it has completely loaded into memory.

NavisWorks is large address aware, utilizing any additional memory assignment following the 3GB switch available on Windows XP systems.

To start NavisWorks, double-click the NavisWorks icon on the desktop, or go to **Start > Programs > Autodesk > Autodesk NavisWorks Review 2009 > Autodesk NavisWorks Review 2009**. The following sections will describe the interface in more detail.

NavisWorks contains full context-sensitive Help. Click , and click the toolbar button or menu option to display the appropriate Help topic. Or, alternatively, go to the **Help** menu.

Chapter 9. File Management

With Autodesk NavisWorks Review 2009 you can open a wide variety of native 3D CAD file types without having to have the CAD application on your machine. See [Chapter 10, *Converting Files*](#) for more detailed information on these file formats and their options. File management all happens with the **File** menu and the **Standard** toolbar.



File Menu

The **File** menu includes the following items:

- New
- Refresh
- Open
- Open URL
- Append
- Merge
- Save
- Save As
- Publish
- Print
- Print Preview
- Print Setup
- Delete
- Send
- Import
- Export
- Recent Files
- Exit


New Files

This option resets NavisWorks and closes existing files.

To create a new file:

- On the **File** menu, click **New**

or

- Click **New**  on the **Standard** toolbar.

Refreshing Files

When working in NavisWorks, it is possible that others may be working on the CAD files you are currently reviewing. For example, if you are coordinating various disciplines on a project, then you may have an overall .nwf file referencing numerous design files. During the iterative stages of the project, any member of the design team could potentially be modifying their CAD files. To ensure the data you are reviewing is current, NavisWorks provides a refresh function to reload any files that have been modified since commencing the review session. This feature does not reload all of the files you have loaded, merely those modified since last opening them.

To refresh your scene with the latest versions of the currently loaded model files:

- On the **File** menu, click **Refresh**

or


- Click **Refresh**  on the **Standard** toolbar.

Opening Files

With Autodesk NavisWorks Review 2009 you can open a wide variety of native CAD file types without having to have the CAD application on your machine. See [Chapter 10, Converting Files](#) for more detailed information on these file formats and their options. To open a model file:

- On the **File** menu, click **Open**

or

- Click **Open**  on the **Standard** toolbar.

Note:

The standard **Open** dialog use of **Shift** and **Control** keys allows multiple files to be selected and appended to the current set of models.

Opening Files via URL

With Autodesk NavisWorks Review 2009 you can open NavisWorks published .nwd files via the Internet. Having uploaded your .nwd file to a web server, this file can then be opened directly from within NavisWorks. Utilizing JetStream technology, it will not be necessary for the entire file to be downloaded before navigation can commence - between 10% and 50% will be sufficient for this, depending on the file structure. (The greater the hierarchical structure of the model, the closer to 50% will be required for navigation to commence. Similarly, the lesser the hierarchical structure of the model, the closer to 10% will be required).

To open a file via a URL:

- On the **File** menu, click **Open URL**.

Appending Files

NavisWorks enables you to build up a complex scene from smaller models by appending, or uniting, multiple model files together, which can be of any type that Autodesk NavisWorks Review 2009 supports. (See [Chapter 10, Converting Files](#) for more detailed information on these file formats and their options).

Each file has its own units and when appending more files to the scene, each file is automatically scaled to match the units of the first file loaded into the scene. Each file type has a default unit associated with it that it uses when loading files of that type. You can change this associated unit on the **Units** tab of the **Global Options** dialog (see “[Units Options](#)” for more detailed information). However, once a file is loaded, you can change its unit scaling by clicking **File Units and Transform** on the **Edit** menu. See “[Setting a File's Units and Transform](#)” for more information.

The combined set of models may be published as a single NavisWorks .nwd file using the NavisWorks Publisher. These models can then be viewed with NavisWorks Freedom™ free viewer. See “[Publishing from NavisWorks](#)” for more information.

You can also save the combined set of models as an .nwf file. No geometry is saved in this format, but a list of appended files, along with their path relative to the .nwf file is saved, along with any overrides, comments, redlines, viewpoints or other NavisWorks specific information. See “[Saving Files](#)” for more information on saving files.

To append a file:

- On the **File** menu, click **Append**

or

- Click **Append**  on the **Standard** toolbar.


Note:

The standard **Open** dialog use of **Shift** and **Control** keys allows multiple files to be selected and appended to the current set of models.

Merging Files

When merging multiple .nwf files, that each comprise the same reference files, NavisWorks will only load a single set of the combined models, along with all review markup (such as tags, viewpoints or comments) from each .nwf file. Any duplicate geometry or markup will be removed when merged. See “[NWF Files](#)” for more information on .nwf files.

Merging a file:

1. **Open** the first file to be merged, (see “[Opening Files](#)” for information on how to do this).
2. On the **File** menu, click **Merge**
or
Click **Merge**  on the **Standard** toolbar.
3. Browse to and select the file, or files, to be merged.


Note:

The standard **Open** dialog use of **Shift** and **Control** keys allows multiple files to be selected and merged with the currently loaded model.

Saving Files

When you have finished reviewing a model or a set of models and are exiting NavisWorks, you are prompted to save. When saving to a NavisWorks .nwf file, only a list with pointers to the files currently loaded is saved, along with the scene's environment, the current view, clash results (if available) and viewpoints. If you want to take a snapshot of the scene, including all geometry, then you need to publish an .nwd file. See “[Publishing Files](#)” for information on how to do this.

Saving a file:

1. On the **File** menu, click **Save**
or
Click **Save**  on the **Standard** toolbar.
2. Enter a name and location for the file, if you wish to change the existing name.
3. Click **Save** to save the file or **Cancel** to return to NavisWorks without saving.

Saving and Renaming Files

This is exactly the same as the **Save** option (see “ [Saving Files](#) ”, but it gives you the opportunity to rename the file that you are saving.

Saving a file with a new name:

1. On the **File** menu, click **Save As**.
2. Enter a new name and location to store the file.
3. Click **Save** to save the file or **Cancel** to return to NavisWorks without saving.

Publishing Files

Publishing a NavisWorks .nwd file takes a snapshot of the current scene that cannot then be changed (i.e. files cannot be deleted from a published .nwd file). The file can also be used with the NavisWorks Freedom™ free viewer. This command is only available if you have the NavisWorks Publisher option.

See “ [Publishing from NavisWorks](#) ” for more information.

Printing

You can print a hard copy of the current viewpoint to any printer or plotter.

Printing the Current Viewpoint

When the print option is selected, it prints the current viewpoint scaled to fit and centered on the page.


Note:

If you would prefer to export an image for printing, see “ [Exporting an Image](#) ” for more information.

Printing the current viewpoint:

1. On the **File** menu, click **Print**

or

Click **Print**  on the **Standard** toolbar.
2. Check the printer settings are as required, and click **OK** to print the viewpoint or **Cancel** to return to NavisWorks without printing anything.

Note:

The maximum image size is 2048x2048 pixels.

The **Properties** button controls printer-specific ink and paper settings.

Previewing Printouts

Before you print out a copy of the model you are working on, you may wish to see how it will appear.

Previewing a model before printing:

1. On the **File** menu, click **Print Preview**.
2. Use **Zoom In** and **Zoom Out** to do just that with the preview image.
3. Click **Print**, **OK** to confirm and print the image, or click **Close** to return to NavisWorks.

Setting up printouts

This option enables the setting up of paper size and orientation options.

Changing the print setup:

1. On the **File** menu, click **Print Setup**.
The **Print Setup** dialog box is displayed.
2. Make changes as required to the paper, orientation, and click the **Properties** button to change printer-specific settings.
3. Click **OK** to print the image, or click **Cancel** to return to NavisWorks.

Deleting Files

This option deletes the selected files from the scene. It is only available when more than one file is appended in the scene.

Note:

You cannot delete files from within a "published" NavisWorks .nwd file (see "[Publishing Files](#)"). You can only delete appended files, whether they were appended manually, or within an .nwf file.

To delete a file:

- On the **File** menu, click **Delete**.

Note:

It is not possible to **undo** this command.

Emailing Files


NavisWorks is a communication tool, and the **Send** option makes it easy for you to send your current model along with its viewpoints. The **Send** option uses your current email exchange service and will prompt you to set one up if it cannot find one.

Sending an email will first save the current working file, so you are guaranteed to always send the latest review.

To send a file by email from within NavisWorks:

- On the **File** menu, click **Send**

or

- Click **Send**  on the **Standard** toolbar.

This accesses your email package, and sends the current file as an email attachment.

Receiving 3D Mail

If an .nwf file is received, NavisWorks will search for the appended files first using the absolute path that the sender originally saved the file with. This is useful if a team is on a local network and the files can be found using the Universal Naming Convention (UNC). Otherwise, a team not sharing a server can organize a project using the same file hierarchy and drive letter and NavisWorks can find the files this way.

If NavisWorks is unable to find the files, then the recipient can save the attached .nwf in a directory where all the appended files are located. The .nwf can then look for these files relative to its own location.

This way, you are able to move a whole sub-directory from your projects directory to a completely new location. Save the .nwf file in this new place and it will be able to search for the files from here.

Importing Files

The import option inputs Intergraph PDS review data, including:

- PDS Tags (.tag)
- PDS Display Sets (.dst)

It is also possible to import data that has been exported from previous NavisWorks sessions, including:

- Viewpoints XML (.xml)
- Search XML (.xml)
- Search Set XML (.xml)

See “ [Exporting Files](#) ” for more information on exporting data from NavisWorks.

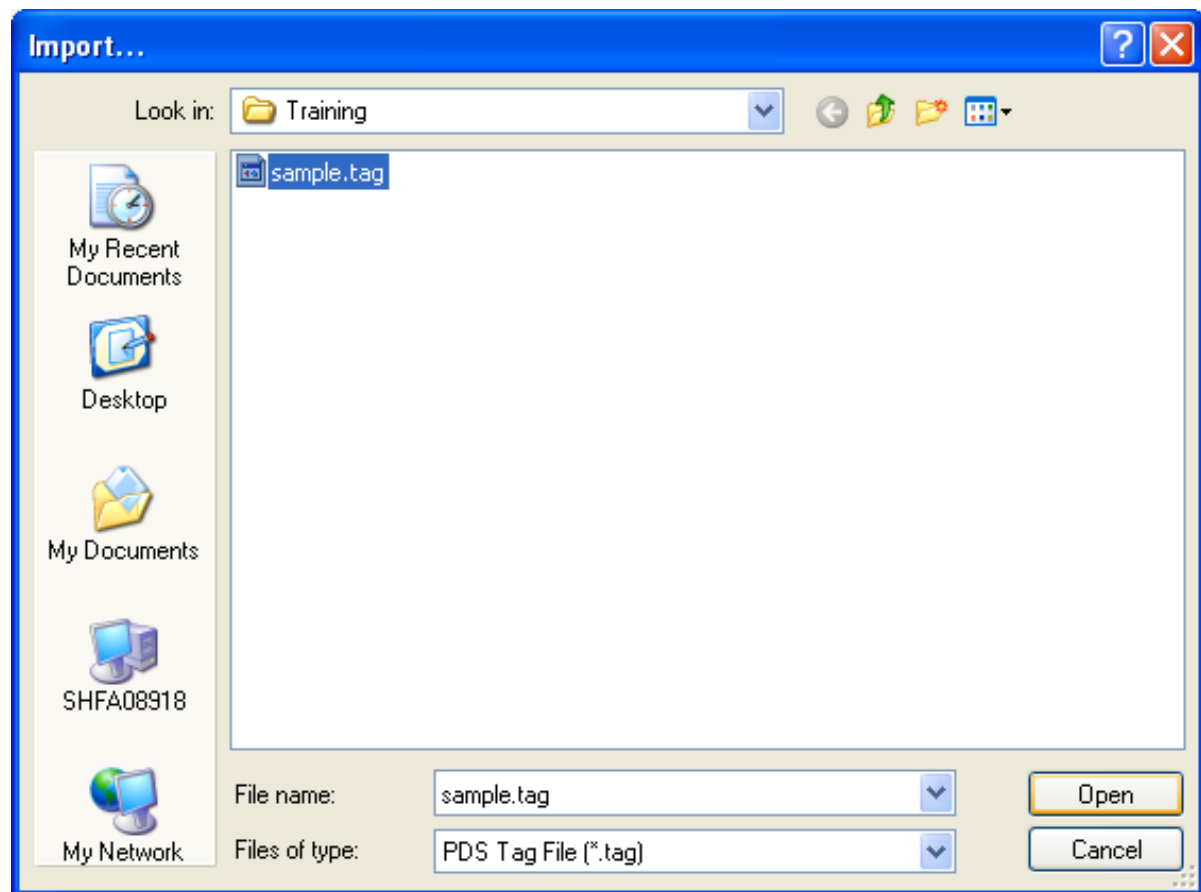
Importing PDS Tags

Tag information from Intergraph PDS contains a unique ID, saved viewpoint and corresponding comments. Tag information created in NavisWorks may also be exported to be used in Intergraph PDS. See “ [Exporting Files](#) ” for more information.

Importing PDS tag files:

1. On the **File** menu, click **Import > PDS Tags**.

The **Import** dialog box is displayed.



2. Locate and **Open** the .tag file to import the PDS tag data, or click **Cancel** to return to NavisWorks without importing a file.

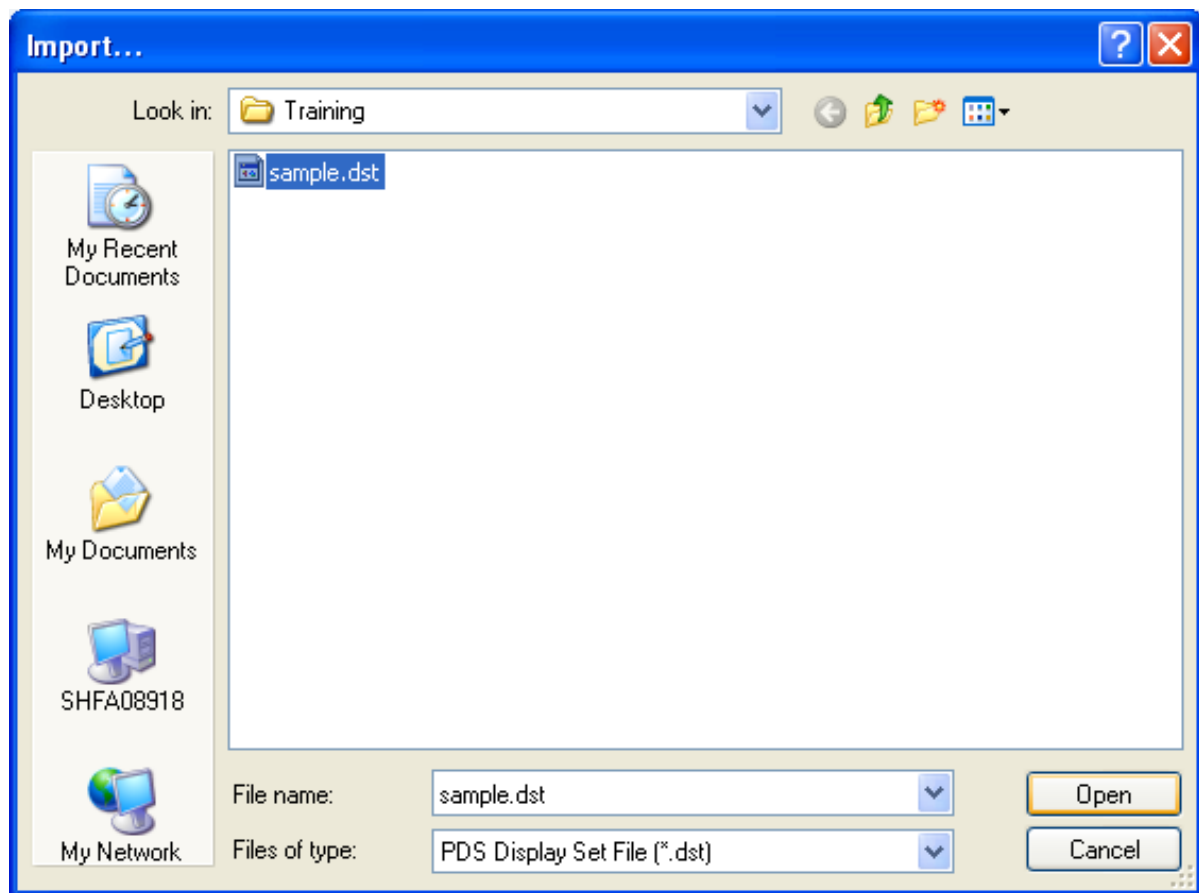
Importing PDS Display Sets

Display sets from Intergraph PDS contain detailed criteria, defining item selections. When imported into NavisWorks, .dst files create search sets in the Selection Sets control bar. See “[Selection and Search Sets](#)” for more information on search sets.

Importing PDS display sets to create search sets:

1. On the **File** menu, click **Import > PDS Display Sets**.

The **Import** dialog box is displayed.



2. Locate and **Open** the .dst file to import the PDS display sets, or click **Cancel** to return to NavisWorks without importing a file.

Importing Viewpoints XML

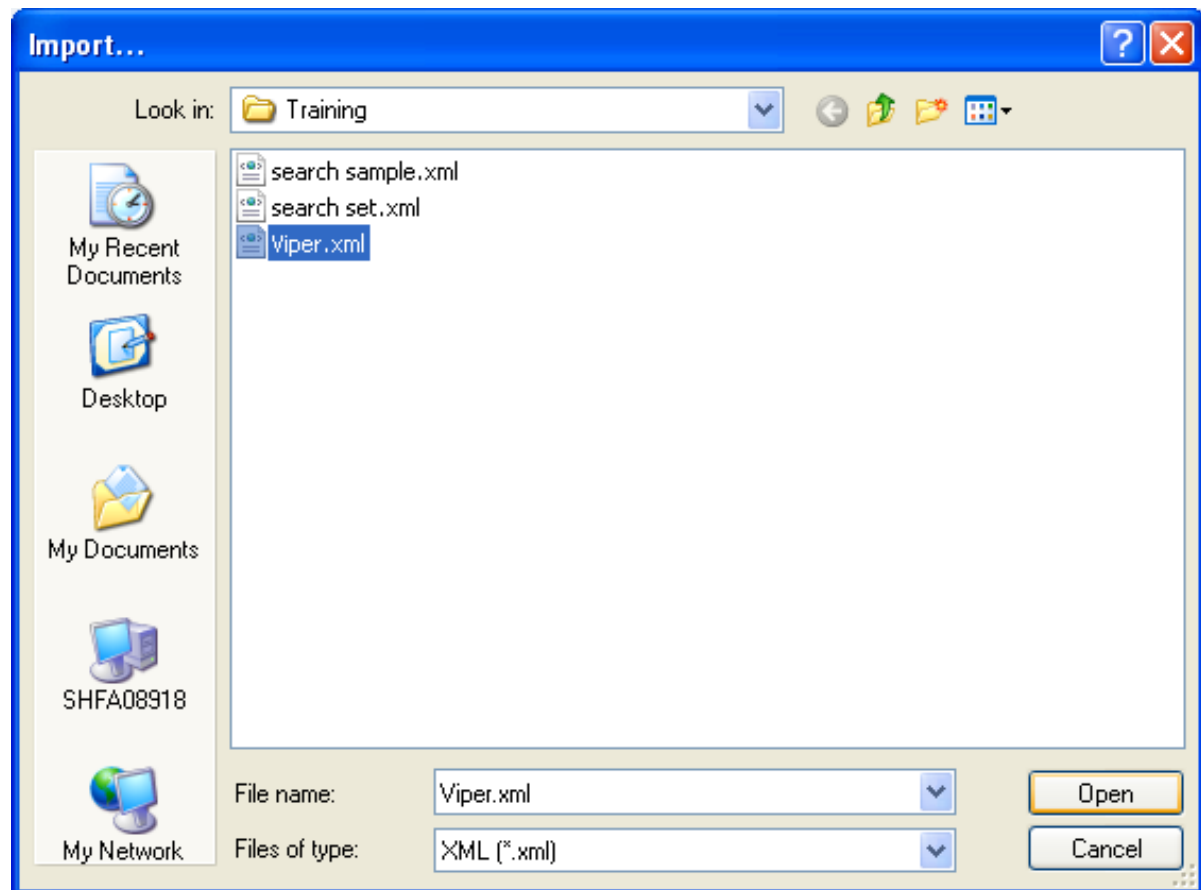
Viewpoints can be imported into NavisWorks via an .xml file, enabling you to bring viewpoints into the current scene from another model file. For example, if you are working on different versions of the same model, you can save viewpoints in one version of the file, export them and then import them into the other version. See “[Saving Viewpoints](#)” for more information on saving viewpoints and “[Exporting Viewpoints](#)”

for more information on exporting viewpoints to an .xml file.

Importing viewpoints and associated data:

1. On the **File** menu, click **Import > Viewpoints XML**.

The **Import** dialog box is displayed.



2. Locate and **Open** the viewpoints .xml file to import the viewpoints, or click **Cancel** to return to NavisWorks without importing a file.

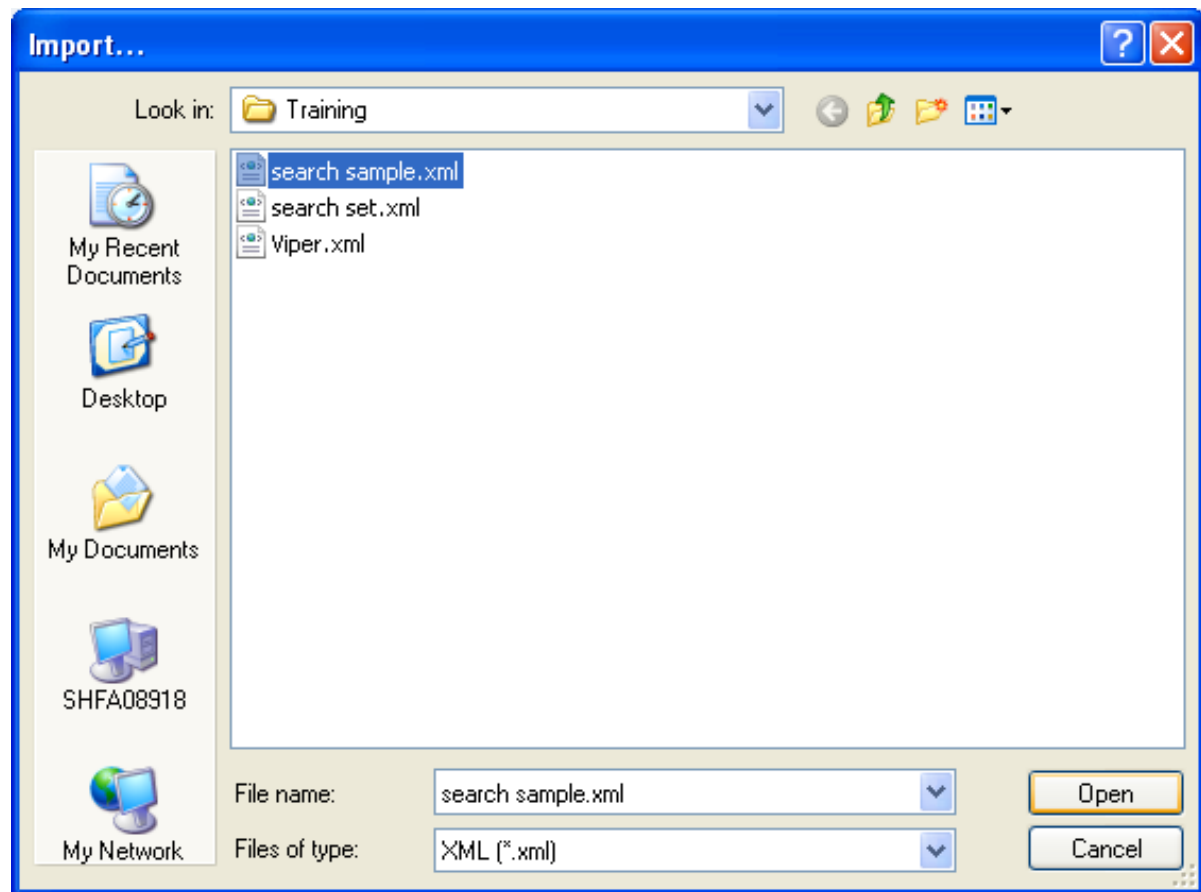
Importing Search XML

Search criteria can be imported into NavisWorks which populates the **Find Items** control bar. The search can then be run on the current model, finding any items that match the specific criteria. See "[Finding Items](#)" for more information on searching the model for items based on their properties.

Importing search criteria into the Find Items control bar:

1. On the **File** menu, click **Import > Search XML**.

The **Import** dialog box is displayed.



2. Locate and **Open** the search .xml file to import the search criteria into the **Find Items** control bar, or click **Cancel** to return to NavisWorks without importing a file.

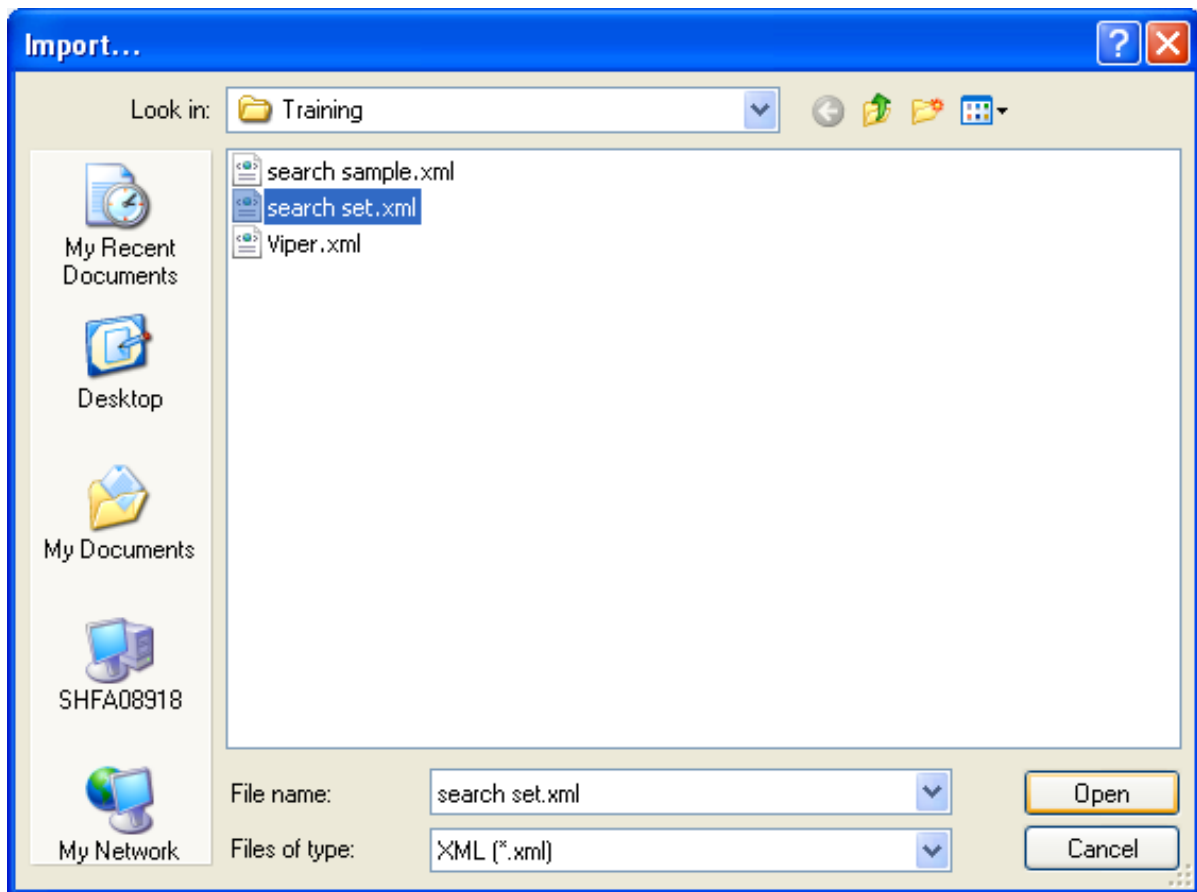
Importing Search Sets XML

Search sets can be imported into NavisWorks which populates the **Selection Sets** control bar with pre-defined search sets. Selecting an imported search set will define the current Find Items criteria and search the current model accordingly. See "[Finding Items](#)" for more information on searching the model for items based on their properties.

Importing search sets into the Selection Sets control bar:

1. On the **File** menu, click **Import > Search Sets XML**.

The **Import** dialog box is displayed:



2. Locate and **Open** the search sets .xml file to import the search sets into the **Selection Sets** control bar, or click **Cancel** to return to NavisWorks without importing a file.

Exporting Files

The export option outputs the current viewpoint in one of four ways:

- Piranesi EPix format (.epx)
- Windows Bitmap format (.bmp)
- Portable Network Graphics format (.png)
- JPEG format (.jpg)

It is also possible to export an animation to:

- Windows AVI (.avi)

Or, as a sequence of individual frames, to:

- JPEG format (.jpg)
- Portable Network Graphics format (.png)
- Windows Bitmap (.bmp)

The export option additionally outputs a variety of review data, including:

- PDS Tags (.tag)
- Viewpoints XML (.xml)
- Current Search XML (.xml)
- Search Sets XML (.xml)
- Viewpoint Report HTML (.html)

The export option outputs a number of additional review file types:

- Autodesk DWF (.dwf)
- Google Earth KML (.kml)

Exporting to a Piranesi EPix Format

Exporting an .epx file for rendering in Informatix's Piranesi:

1. On the **File** menu, click **Export > Piranesi EPix**.
2. Click the **Browse** button to locate a destination and enter a new filename to export, if you wish to change from the existing filename and location.
3. Select the sizing options for the file to be exported. (See "[Controlling the Size of an Image](#)" for more details).
4. Click **Save** to export the file, or **Cancel** to return to NavisWorks.

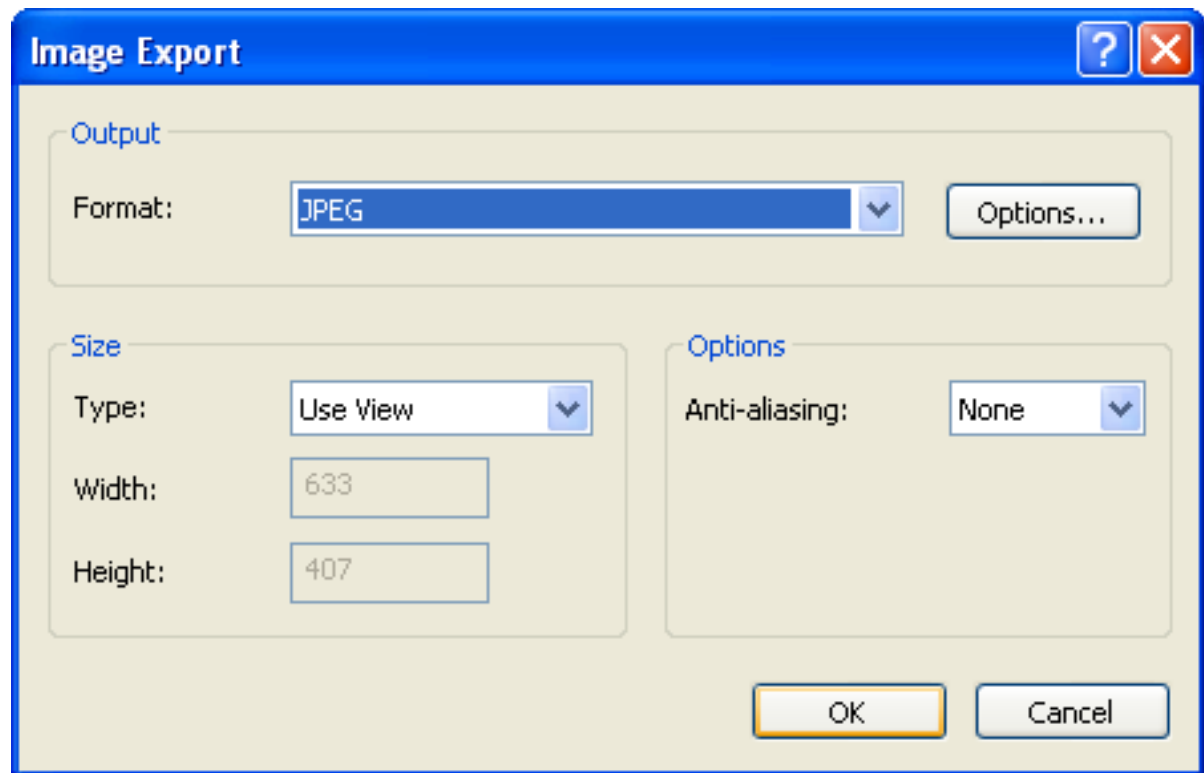
Exporting an Image

Exporting to a Bitmap, PNG or JPEG

1. Display the view you want to export in the main navigation window, and click **Export > Image** on the

File menu.

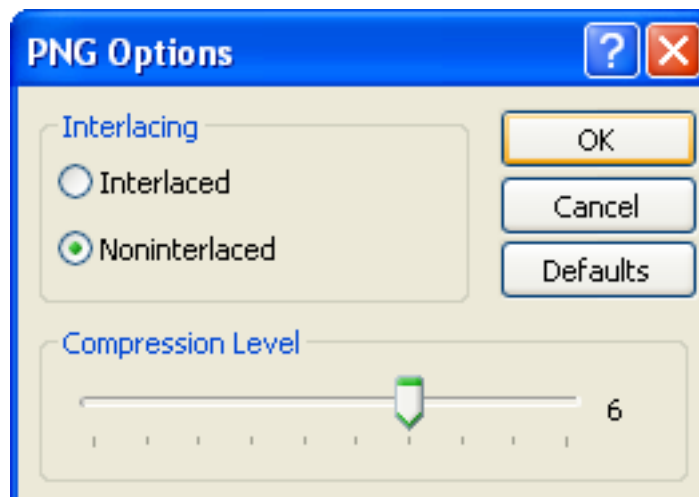
The **Image Export** dialog box is displayed.



2. Select the format of the image you wish to export:

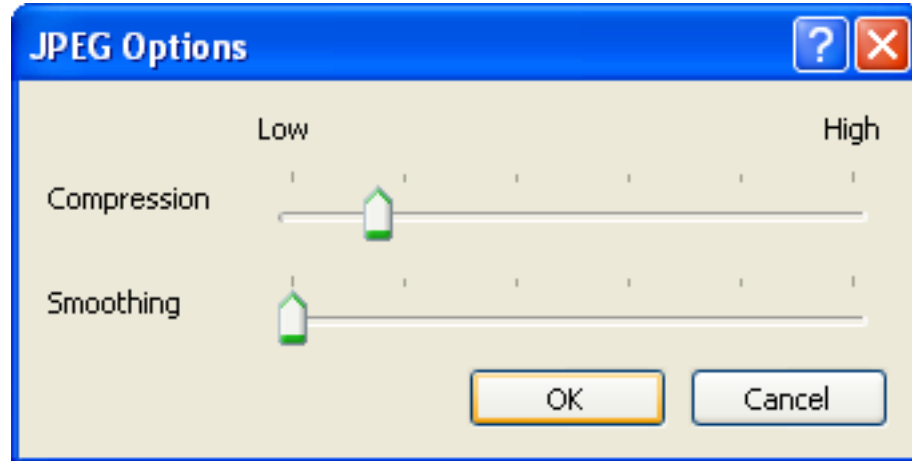
- Windows Bitmap
- Portable Network Graphics (PNG)

Select **Interlacing** and **Compression** options from the **PNG Options** dialog box:



- JPEG

Select **Compression** and **Smoothing** options from the **JPEG Options** dialog box:



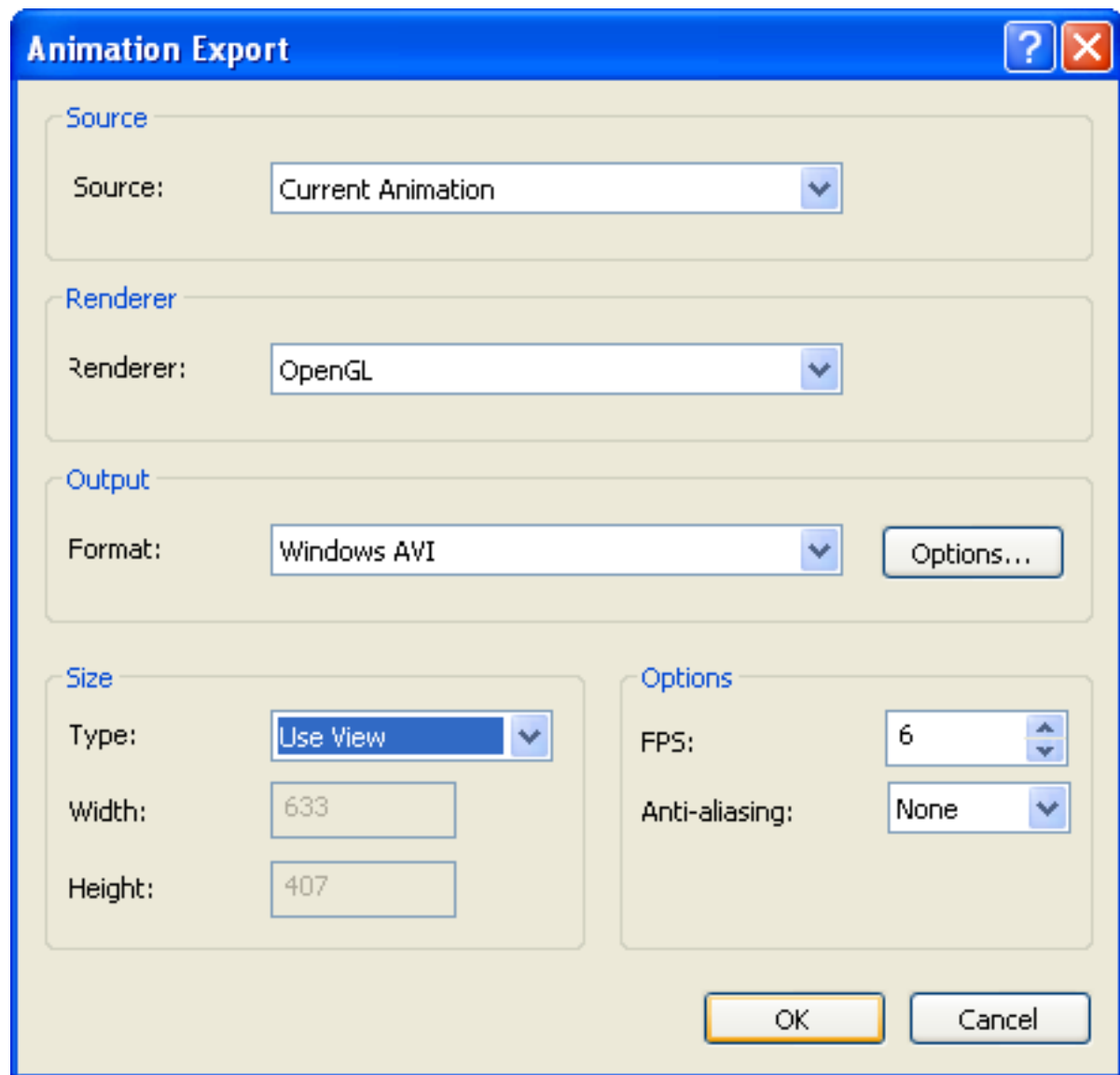
3. Select the sizing options for the file to be exported. (See “ [Controlling the Size of an Image](#) ” for more details).
4. Click **OK** to continue, or click **Cancel** to return to NavisWorks without exporting an image.
5. Enter a new name and location to store the file.
6. Click **Save** to export the file, or **Cancel** to return to NavisWorks.

Exporting an Animation

Exporting an animation to an .avi file, or a sequence of image files:

1. With an animation selected, on the **File** menu, click **Export > Animation**.

The **Animation Export** dialog box will be displayed.



2. Select the **Source** from which you wish to export the animation.
Current Animation - the currently selected viewpoint animation.
3. Select the **Renderer** with which you wish to render the exported animation.
OpenGL - quickly renders your animation; this option is also ideal for previewing animations.
4. Select the **Format** in which you wish the output to be exported in:
 - Windows AVIClick **Options...** to select the **Video Compression** you require.

Note:

Clicking **Compression** will open a standard Windows™ dialog box that allows you to choose which codec to use, as well as its configuration. Only those codecs currently installed will be shown and the PC that the .avi file will be run on will also need the same codec installed.

- JPEG (sequence of static images, taken from individual frames)

Click **Options...** to set the **Compression** and **Smoothing** levels you require.

- PNG (sequence of static images, taken from individual frames)

Click **Options...** to set the **Interlacing** and **Compression** levels you require.

- Windows Bitmap (sequence of static images, taken from individual frames)

5. Select the sizing options for the file to be exported. See “ [Controlling the Size of an Image](#) ” for more details.
6. For AVI files, you should also enter the number of frames per second (FPS) you require.

Note:

The higher the FPS, the smoother the animation will be. However, using a high FPS will considerably increase the rendering time. 10-15 fps should be enough for a good quality AVI.

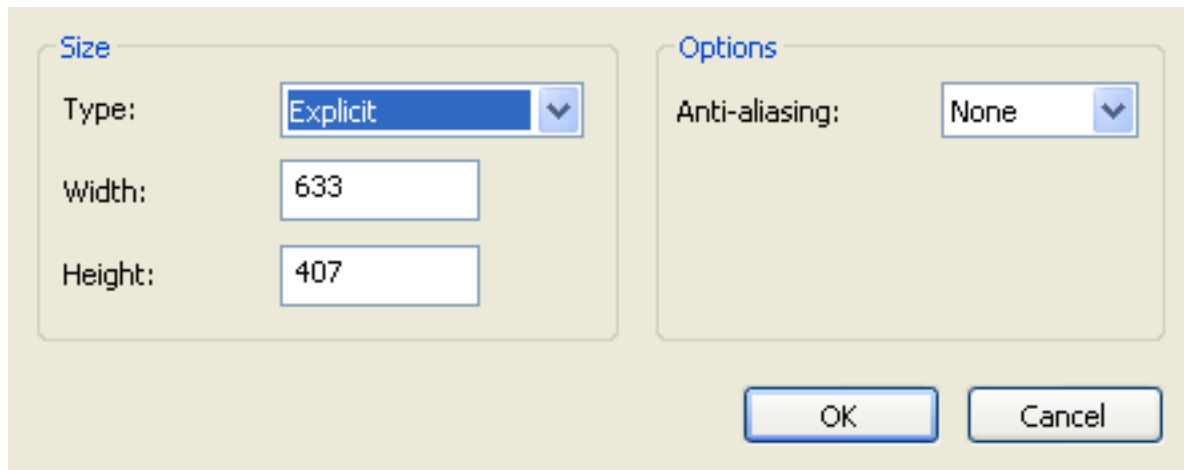
7. Click **OK** to continue, or **Cancel** to return to NavisWorks.
8. Enter a new name and location to store the file(s).

Note:

For image sequences, the name will contain the first integer of a 'counter', e.g. 001. Subsequent frames will be automatically incremented by one, e.g. 002, 003, 004 and so on.

9. Click **Save** to export the file(s), or **Cancel** to return to NavisWorks.

Controlling the Size of an Image



The screenshot shows a dialog box with two main sections: 'Size' and 'Options'. In the 'Size' section, 'Type' is set to 'Explicit' (indicated by a dropdown arrow), 'Width' is 633, and 'Height' is 407. In the 'Options' section, 'Anti-aliasing' is set to 'None' (indicated by a dropdown arrow). At the bottom right, there are 'OK' and 'Cancel' buttons.

The size of the exported image/animation can be set in various ways:

Explicit allows you full control of the width and height (the dimensions are in pixels).

Aspect Ratio allows you to set the height, and the width is automatically calculated from the aspect ratio of your current view.

Use View takes the width and height of your current view.

Anti-Aliasing smoothes the edges of the exported images. The higher the number, the smoother the image, but the longer they take to export. 4x should be adequate for most situations.

Note:

There is a maximum size of 2048 x 2048 pixels, for NavisWorks OpenGL output.

Exporting PDS Tags

Exporting PDS tags

1. On the **File** menu, click **Export > PDS Tags**.
2. Enter a new filename and location, if you wish to change from those suggested.
3. Click **Save** to export the .tag file, or **Cancel** to return to NavisWorks.

Exporting Viewpoints

Viewpoints can be exported from NavisWorks to an .xml file. These viewpoints contain all associated data, including camera positions, sections, hidden items and material overrides, redlines, comments, tags and collision detection settings.

Once the viewpoint data is exported to this text-based file format, it can either be imported into other NavisWorks sessions, or it can be accessed and used in other applications. For example, you may want to set up the same viewpoints in your CAD application.

Exporting viewpoints:

1. On the **File** menu, click **Export > Viewpoints XML**.
2. Enter a new filename and location, if you wish to change from those suggested.
3. Click **Save** to export the .xml file, or **Cancel** to return to NavisWorks.

Exporting Current Search

The search criteria specified in the Find Items dialog box can be exported to an .xml file. This can then be imported into other NavisWorks sessions. For example, if you have specified a complicated search criteria, containing various logic statements, that relates to all projects you work on, then this feature allows you to specify it once and use it on all projects.

Exporting current search:

1. From the **File** menu, choose **Export > Current Search XML**.
2. Enter a new filename and location, if you wish to change from those suggested.
3. Click **Save** to export the .xml file, or **Cancel** to return to NavisWorks.

Exporting Search Sets

Saved search sets can be exported from NavisWorks as an .xml file. These can then be imported into other NavisWorks sessions and re-used. For example, if you have a number of generic searches that you perform on all of your projects, this feature allows you to specify the searches once and use them on all projects.

Exporting search sets:

1. On the **File** menu, click **Export > Search Sets XML**.
2. Enter a new filename and location, if you wish to change from those suggested.
3. Click **Save** to export the .xml file, or **Cancel** to return to NavisWorks.

Exporting Viewpoints Report

An .html file can be exported containing a JPEG of all of the saved viewpoints and associated data, including camera position and comments.

Note:

To customize the appearance or layout of the html file, you will need to edit the `viewpoints_report_lang.xml` file, where `lang` is a code representing your language. The installed file is located in the `stylesheets` subdirectory of the NavisWorks install directory. You can copy the edited file to the `stylesheets` subdirectory of any of the NavisWorks search directories. See “ [Search Directories](#) ” for more information.

Exporting viewpoints report:

1. On the **File** menu, click **Export > Viewpoints Report HTML**.
2. Enter a new filename and location, if you wish to change from those suggested.
3. Click **Save** to export the report, or **Cancel** to return to NavisWorks.

Exporting to Autodesk DWF

Autodesk DWF files can be exported from NavisWorks. The exporter creates a .dwf file containing:

- All geometry
- All materials
- Per-vertex colors
- Properties (where available)

Exporting a DWF file:

1. On the **File** menu, click **Export > Autodesk DWF**.
2. Enter a new filename and location, if you wish to change from those suggested.
3. Click **Save** to export the file, or **Cancel** to return to NavisWorks.

Exporting to Google Earth KML

Google Earth KML files can be exported from NavisWorks. The exporter creates a compressed KML file with the extension .KMZ and supports the export of:

- Triangles
- Lines

- Materials (colour and flat transparency only)
- Viewpoints (adjustments may occur due to Google Earth limitations)
- Model Hierarchy
- Hyperlinks (currently only URLs work correctly in Google Earth)

Exporting to Google Earth KML files:

1. On the **File** menu, click **Export > Google Earth KML....** This brings up the following dialog box.

KML Options

Options

Export model relative to terrain height ☒

Collapse on export: None

Limit number of polygons

Enable ☒

Number of polygons 100000

Origin

	Longitude (°)	Latitude (°)	Altitude (m)	
Google Earth	1.55971211056774	3.3726012123342	0.000000000000000	Import...
	X (m)	Y (m)	Z (m)	
NavisWorks Manage	12.860	-45.189	-121.756	Pick...

Second reference point

☐ Enabled

	Longitude (°)	Latitude (°)	Altitude (m)	
Google Earth	0.000000000000000	0.000008600000000	0.000000000000000	Import...
	X (m)	Y (m)	Z (m)	
NavisWorks Manage	1.00	0.00	0.00	Pick...

Third reference point

☐ Enabled

	Longitude (°)	Latitude (°)	Altitude (m)	
Google Earth	0.000008600000000	0.000000000000000	0.000000000000000	Import...
	X (m)	Y (m)	Z (m)	
NavisWorks Manage	0.00	0.00	1.00	Pick...

Help OK Cancel

2. Select **Export model relative to terrain height** to put Google Earth in a mode where all heights are measured from the surface of the ground. When this is off all heights are measured from sea-level.

Note:

When positioning a model relative to sea level, the height of the Google Earth reference points must also be measured relative to sea level. When positioning a model relative to the ground, the Google Earth reference points must be measured relative to the ground.

Google Earth always places new placemarks at an altitude of zero, irrespective of whether that is relative or absolute.

3. **Collapse on export** allows different levels of collapsing parts of the model hierarchy in the exported file.
 - **None** ensures the whole hierarchy is exported
 - **All objects** collapses everything into one node
 - **Files** collapses each file into one node
 - **Layers** collapses each layer into one node
 4. **Limit number of Polygons** should be enabled to restrict the amount of geometry exported into the output file. Geometry is selected on the basis of taking the most obvious objects in preference to the fine detail. If the exported file is too large for Google Earth to display, try enabling this and reducing the number of polygons. **View, Scene Statistics** in NavisWorks shows the number of triangles and/or lines in the current project. By setting a polygon limit you are choosing to export only some of these items.
-

Note:

Google Earth's ability to handle large numbers of polygons is far more limited than NavisWorks. Hence it is worth noting that currently Google Earth will consider 1,000,000 polygons as being a big model.

5. The **Origin** position values are the first pair of reference points on the Google Earth surface, and must always be defined. The NavisWorks reference point will always be positioned to exactly overlay the Google Earth reference point.

Second and **Third** reference points can be used, and if enabled then the position and orientation of the model can be more accurately defined.

6. Use the **Import** buttons to read-in saved placemark locations from KML files exported from Google Earth.

The Origin **Import** button differs slightly from the other two; if the KML file contains multiple placemarks, this button will offer the user the choice of importing second and third reference points if available. The other two buttons will only import a single reference point.

7. The **Pick** buttons allow the reference point locations to be selected in the main 3D view.

These points must be visible in the main 3D view prior to exporting, as once the **KML Options** dialog box is open you will not be able to navigate before picking.

Note:

You may wish to use **View, Split** to split the main 3D view enabling you to have separate views of each reference point.

Quitting NavisWorks

Quitting NavisWorks:

1. On the **File** menu, click **Exit**
2. If the model has been changed since opening it, NavisWorks will ask you whether you want to save any changes. Respond appropriately and NavisWorks will then close.

Chapter 10. Converting Files

With Autodesk NavisWorks Review 2009 you can open a wide variety of native CAD file types without having to have the CAD application on your machine. Files read by NavisWorks include .dwg, .dgn, .dxf and Inventor. For a full list of CAD files that NavisWorks can open, please refer to the web site www.autodesk.com/navisworksreview. This site will also explain which entities are read by NavisWorks and which are ignored, as well as any object property information that is converted. It is possible to load multiple files of different formats into the same scene in NavisWorks and set their units and origins appropriately. There are also a number of options to help optimize native CAD file reading.

In addition to these native CAD files, Autodesk NavisWorks Review 2009 also reads its own native .nwc (NavisWorks Cache), .nwf (NavisWorks File review) and .nwd (published NavisWorks Data) file formats.

Some file formats, such as those from Autodesk's Viz and Graphisoft's ArchiCAD cannot be read directly by NavisWorks but there are exporters available to export to the NavisWorks .nwc file format from these applications. See “ [File Exporters](#) ” for more details.

File Readers

As well as the NavisWorks file formats, .nwf, .nwd and .nwc, NavisWorks can open a variety of native CAD and scanning applications' formats:

- .dwg
- Bentley AutoPLANT .dwg, .mdb
- .dxf
- .dwf
- .3ds
- .dgn
- .man
- PDS files
- .iges
- .step
- Inventor parts & assemblies
- VRML world files (.wrl;.wrz)
- Riegl Scan data (.3dd)
- Faro Scan data (.fls, .flw, .iQscan;.iQmod;.iQwsp)
- Leica Scan data (.pts;.ptx)
- Z+F Scan data (.zfc;.zfs)
- ASCII Laser Scan data (.asc;.txt)

- STL Stereolithography data (.stl)
- AVEVA Review (.rvm)
- IFC files (.ifc)
- Sketchup (.skp)

NWF Files

.nwf files can be saved by NavisWorks in order to save a current review of the scene. No geometry is saved in this format, but a list of appended files, along with their path relative to the .nwf file is saved, along with any overrides, comments, redlines, viewpoints or other NavisWorks specific information. .nwf files are useful when the CAD files are still changing throughout the design period, as the latest files are loaded each time the .nwf file is opened.

NWD Files

.nwd files are files published by NavisWorks Publisher and are snapshots of the model at a certain time. See “ [Publishing from NavisWorks](#) ” for more information on this.

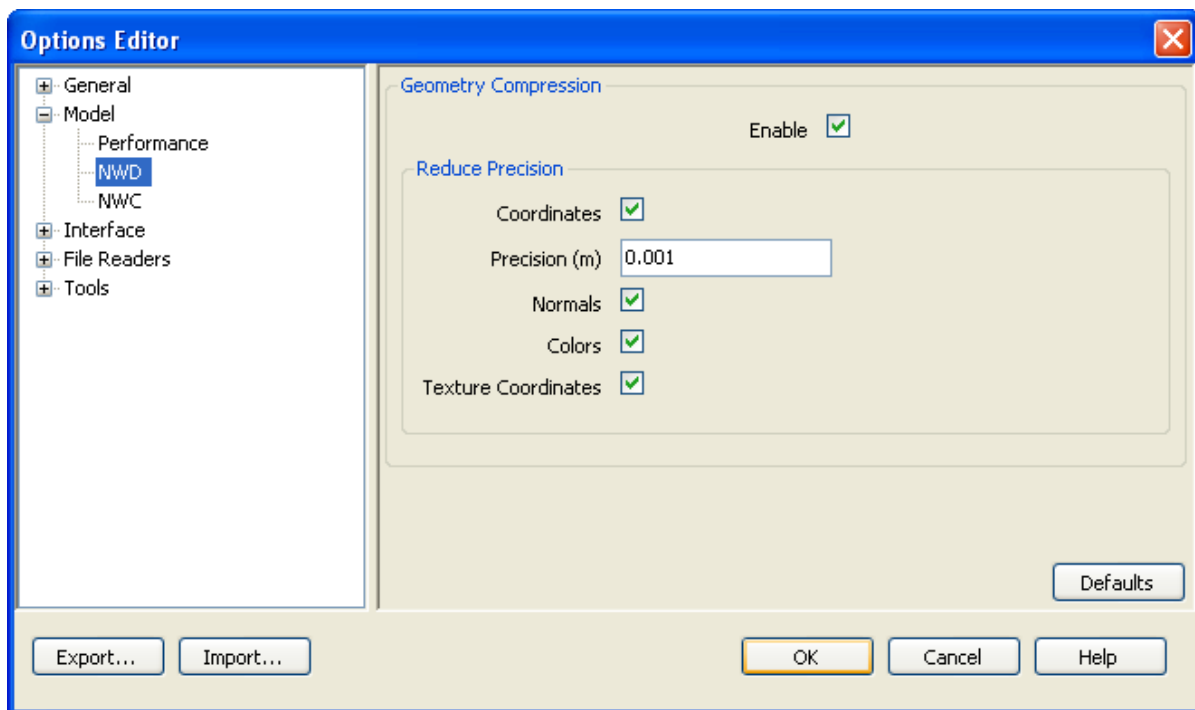
NWD Options

NavisWorks allows you to enable and disable geometry compression and select whether the precision of certain options should be reduced when saving (or publishing) .nwd files. Geometry compression results in less memory being required and therefore smaller .nwd files.

Setting NWD options:

1. On the **Tools** menu, click **Global Options**.
2. Expand the **Model** node in the **Options Editor** dialog box, and click the **NWD** option.

The NWD page is displayed.



3. Clear the **Enable** check box if you do not require any geometry compression.
4. Select the **Coordinates** check box if you want to reduce the precision of coordinates.

Enter the value to which you wish coordinates to be precise to in the **Precision** box. The larger the value, the less precise coordinates will be and the smaller the .nwd will be.

5. Select the **Normals** check box to reduce the precision of normals.
6. Select the **Colors** check box to reduce the precision of colors.
7. Select the **Texture Coordinates** check box to reduce the precision of texture coordinates.
8. Click **OK** to set these options or **Cancel** to exit the dialog without setting them.

NWC Files

Cache files (.nwc) are used when reading native CAD files, such as files from AutoCAD or MicroStation. By default, when Autodesk NavisWorks Review 2009 opens a native CAD file, it first checks in the same directory whether there is a NavisWorks cache file present with the same name as the CAD file but with a .nwc extension. If there is, and this cache file is newer than the native CAD file, then NavisWorks will open this file instead as it has already been converted to NavisWorks format and therefore will open much quicker. If, however, there is no cache file present, or the cache file is older than the native CAD file, then NavisWorks will have to open the CAD file and convert it. At this point, it will by default write a cache file in the same directory and with the same name as the CAD file, but with the .nwc extension, for speeding up the opening of this file in future.

See “[File Exporters](#)” for more information on why you might want to use the .nwc file exporters, which CAD applications you can export from and how.

NWC Options

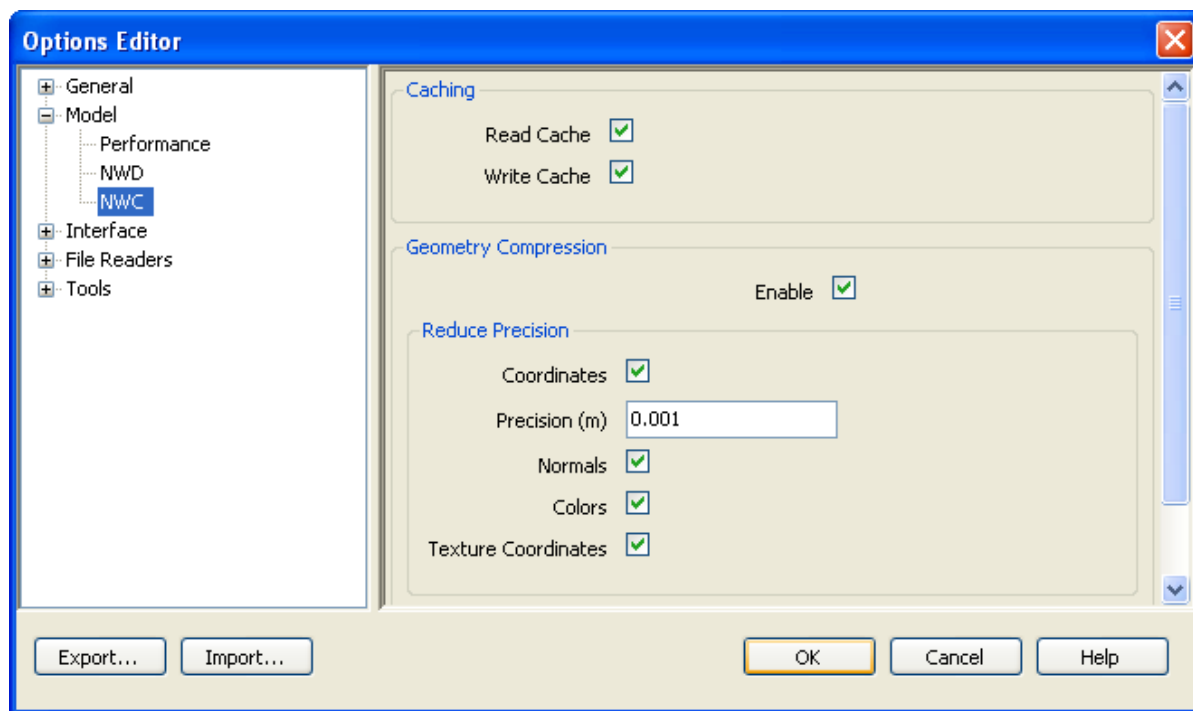
NavisWorks allows you to enable and disable the reading and writing of cache files.

This describes the default process. The options here enable you to enable and disable the reading and writing of cache files. For example, you may want to disable reading cache files to ensure that NavisWorks converts every native CAD file each time it is read, even though this is a slower process. Also, you may want to disable the writing of cache files in order to save on disk space and clutter, even though the cache files are generally many times smaller than the original native CAD files.

Setting NWC options:

1. On the **Tools** menu, click **Global Options**.
2. Expand the **Model** node in the **Options Editor** dialog box, and click the **NWC** option.

The NWC page is displayed.



3. Clear the **Read Cache** check box if you want to ignore any existing caches when opening a native CAD file.
4. Clear the **Write Cache** check box if you do not wish to write a cache file the next time a native CAD file is loaded.
5. Clear the **Enable** check box if you do not require any geometry compression when .nwc files are written.
6. Select the **Coordinates** check box if you want to reduce the coordinate precision.

Enter the value to which you want coordinates to be precise to in the **Precision** box. The larger the

value, the less precise coordinates will be and the smaller the .nwc will be.

7. Select the **Normals** check box to reduce the precision of normals.
8. Select the **Colors** check box to reduce the precision of colors.
9. Select the **Texture Coordinates** check box to reduce the precision of texture coordinates.
10. Click **OK** to set these options or **Cancel** to exit the dialog without setting them.

DWG and DXF Files

NavisWorks's .dwg and .dxf file reader uses Autodesk's ObjectDBX™ technology and so is guaranteed to read all object geometry and information for those third party applications that utilize the ObjectDBX Framework.

The reader currently supports all surface (shaded) entities (3D faces, rectangular meshes, polyface meshes, circles, extruded lines and so on), including Proxy Graphics and custom objects such as ACIS based entities (3D Solid, Region), lines, points and snap points. Complex entities (shapes, dimensions, text) are not supported. The structure of the drawing is preserved including xrefs, blocks, inserts, AutoCAD color index, layers, views and active viewpoint. Entities are colored using the AutoCAD Color Index (ACI), so will match those in an AutoCAD "shaded" view.

There is also an .nwc file exporter for AutoCAD - see "[AutoCAD .nwc Exporter](#)" for more details.

Note:

The reader supports files from all products based on AutoCAD 2009 and earlier.

Supported Entities

- All 2D and 3D geometry, including arcs, lines, polylines with non-zero thickness, ACIS objects (regions and solids), polygon and polyface meshes, 3D faces and surfaces.
- Points and snap points.
- Lines, polylines, circles, arcs with zero thickness.
- Named views.
- Layers.
- Colors.
- Blocks, inserts and multiple inserts.
- Groups.
- External references (xrefs).
- Hyperlinks.
- Text or multi-line text.

- Entity handles.
- Attributes.
- File properties.

Unsupported Entities

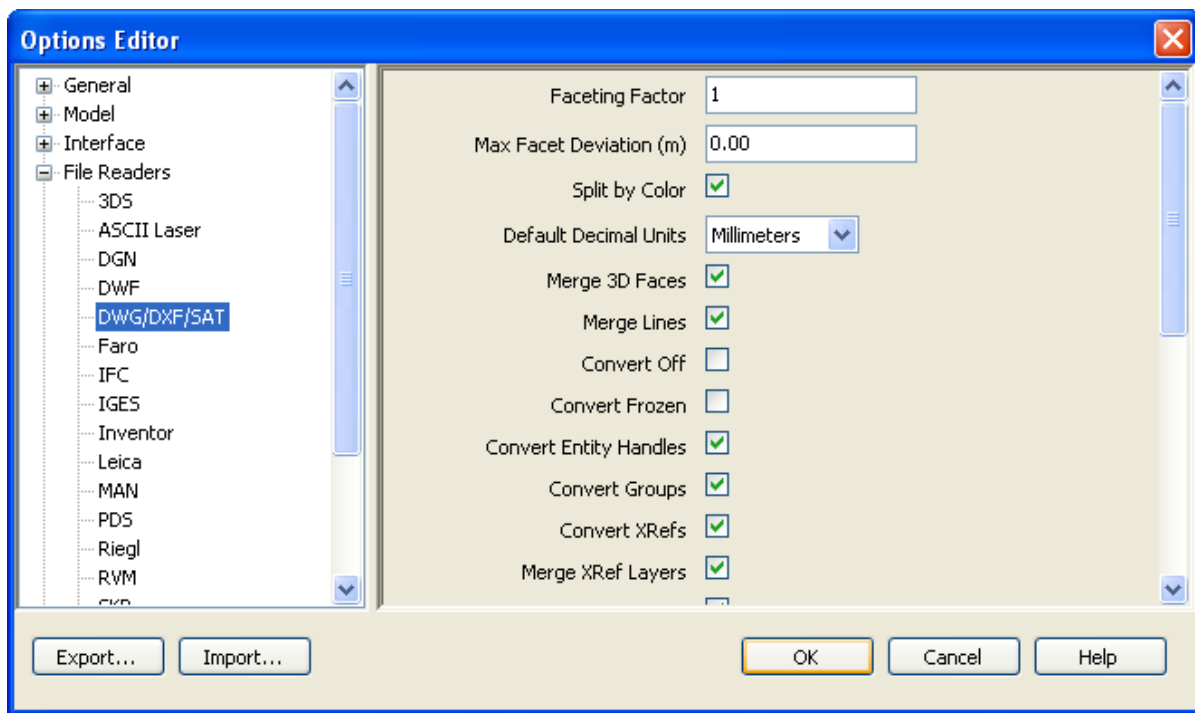
- Lights
- Splines
- Multi-lines
- Linetypes
- Dimensions and leaders
- Raster bitmaps
- Construction lines (xlines and rays)
- Hatching

DWG and DXF File Reader Options

Setting the .dwg and .dxf file reader options:

1. On the **Tools** menu, click **Global Options**.
2. Expand the **File Readers** node in the **Options Editor** dialog box, and click the **DWG/DXF/SAT** option.

The DWG/DXF/SAT page is displayed.

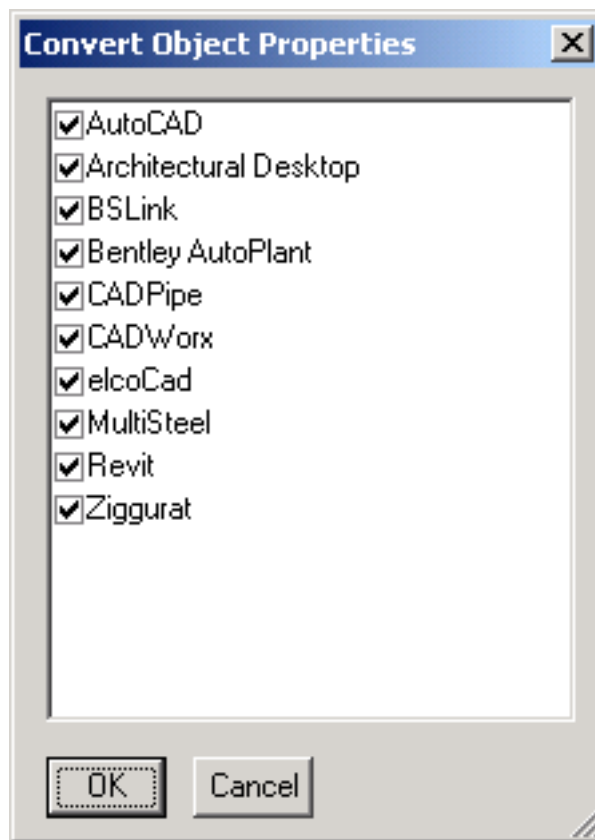


3. Enter the **Faceting Factor** (the value must be greater than 0). The higher the value, the more NavisWorks will facet rounded entities and, therefore, the smoother they will appear. See [Faceting Factor](#) for more information.
4. Enter the **Max Facet Deviation**. This will facet entities to within the specified tolerance. See [Max Facet Deviation](#) for more information.
5. Select the **Split by Color** check box if you want to be able to select parts of compound entities in NavisWorks. For example, a window object from Architectural Desktop may be split into a frame and a pane. If this check box is not selected, then you will only be able to select the window object as a whole, whereas if you select this check box, you will be able to select the individual pane and frame. However, the names of the pane and frame will be based on their color.
6. From the **Default Decimal Units** drop-down list, choose the type of units that NavisWorks will use when opening .dwg and .dxf files that were created with decimal drawing units. Note that .dwg and .dxf files do not specify the units they were created in. If the units turn out to be wrong, they can be easily changed using the **File Units and Transform** option (see "[Setting a File's Units and Transform](#)" for more details).
7. Select the **Merge 3D Faces** check box if you want to reduce the complexity of the model as seen in the selection tree by interpreting adjoining faces with the same color, layer and parent as a single item. To keep the entities as separate items in NavisWorks, clear the check box.
8. Select the **Merge Lines** check box if you want to reduce the complexity of the model as seen in the selection tree by interpreting joining lines with the same color, layer and parent as a single item. To keep the entities as separate items in NavisWorks, clear the check box.
9. Select the **Convert Off** check box if you want to read layers that are switched off in .dwg and .dxf files. They will be converted but hidden in NavisWorks.
10. Select the **Convert Frozen** check box if you want to read layers that are frozen in .dwg and .dxf files.

They will be converted but hidden in NavisWorks.

11. Select the **Convert Entity Handles** check box if you want to read entity handles as a property attached to the item in NavisWorks.
12. Select the **Convert Groups** check box if you want to retain the groups from .dwg and .dxf files, adding another selection level to the selection tree. See [Chapter 13, Selecting Items](#) for more information on selecting objects and the selection tree.
13. Select the **Convert XRefs** check box if you want to convert any external reference files contained within the .dwg file. Clear this check box to get more control over which files you append into NavisWorks.
14. Select the **Merge XRef Layers** check box if you wish to merge the layers of external reference files into those of the main .dwg file. Leaving this unchecked will keep the external reference file separate within the selection hierarchy of NavisWorks.
15. Select the **Convert Views** check box if you want to convert the named views from the file into NavisWorks viewpoints.
16. Select the **Convert Points** check box if you want to read any points from .dwg and .dxf files. See “[Display Options](#)” for more information on how to display these in NavisWorks.
17. Select the **Convert Lines** check box if you want to read any lines and arcs from .dwg and .dxf files. See “[Display Options](#)” for more information on how to display these in NavisWorks.
18. Select the **Convert Snap Points** check box if you want to read any snap points from .dwg and .dxf files. See “[Display Options](#)” for more information on how to display these in NavisWorks.
19. The **Loader Version** drop-down list allows selection of which version of ObjectDBX is used when loading AutoCAD files. This allows you to select support for the correct version of object enablers that may be used within the file. Please note that once any particular version of ObjectDBX is loaded, which occurs during reading of a .dwg or .dxf file, that the version in use will not change until NavisWorks is restarted.
20. Select the **Use ADT Standard Configuration** check box to force reading of Autodesk Architectural Desktop .dwg files using the Standard display configuration. If unchecked, geometry and materials will be read in according to whether they are displayed in the currently saved display configuration.
21. Select the **Convert Hidden ADT Spaces** check box to perform conversion of space objects that lack any visible 3D geometry in ADT (for example if they lack floor or ceiling thicknesses). This will result in corresponding hidden objects appearing in NavisWorks. The normal behavior for space objects that have visible 3D geometry in ADT is unaffected.
22. The **Render Type** drop-down list enables you to specify the render style used for objects when loading .dwg files.

Selecting the **Automatic** option means NavisWorks will use the render style saved in the .dwg file. If geometry does not appear correctly, adjust the render style by selecting the **Rendered**, **Shaded**, or **Wireframe** option from the drop-down list, as appropriate
23. Clicking the **Advanced** button will open a dialog which giving you the option to read object information from various third party applications that are built on AutoCAD.



Check those applications you wish to read information from.

24. Click **OK** to set these options or **Cancel** to exit the dialog without setting them.

DWF Files

Autodesk's DWF (Design Web Format) was specifically developed by Autodesk as a file format for architects, engineers, and GIS professionals to share design data. The NavisWorks file reader reads all 3D geometry, as well as textures and properties. A full list is given below.

Supported Entities

- All 3D geometry
- Texture coordinates
- Colors (per-vertex, per-face)
- Property fields
- Categories

Unsupported Entities

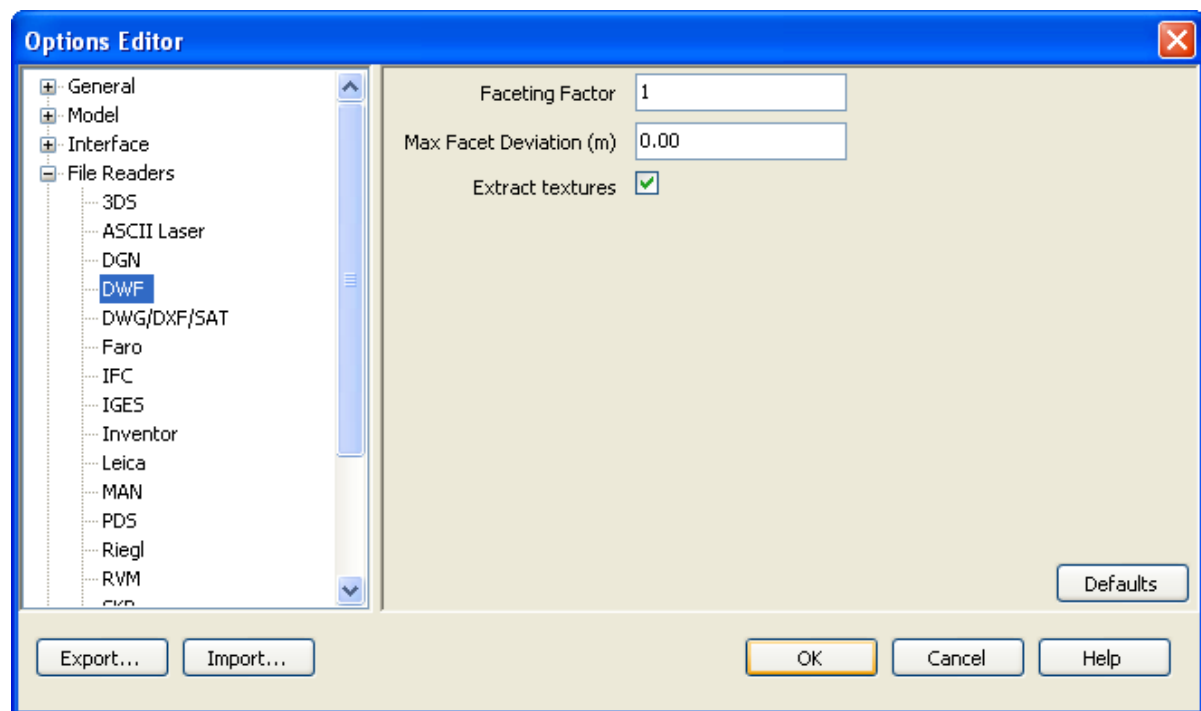
- 2D lines/plot sections
- Thumbnails
- Marked-up sketches
- More than one 3D section per file (any others are ignored)
- NURBS Surfaces
- Cameras

DWF File Reader Options

Setting the .dwf file reader options:

1. On the **Tools** menu, click **Global Options**.
2. Expand the **File Readers** node in the **Options Editor** dialog box, and click the **DWF** option.

The DWF page is displayed.



3. Enter the **Faceting Factor** (the value must be greater than 0). The higher the value, the more NavisWorks will facet rounded entities and therefore the smoother they will appear. See [Faceting Factor](#) for more information.

4. Enter the **Max Facet Deviation**. This will facet entities to within the specified tolerance. See [Max Facet Deviation](#) for more information.
5. Click **OK** to set these options or **Cancel** to exit the dialog without setting them.

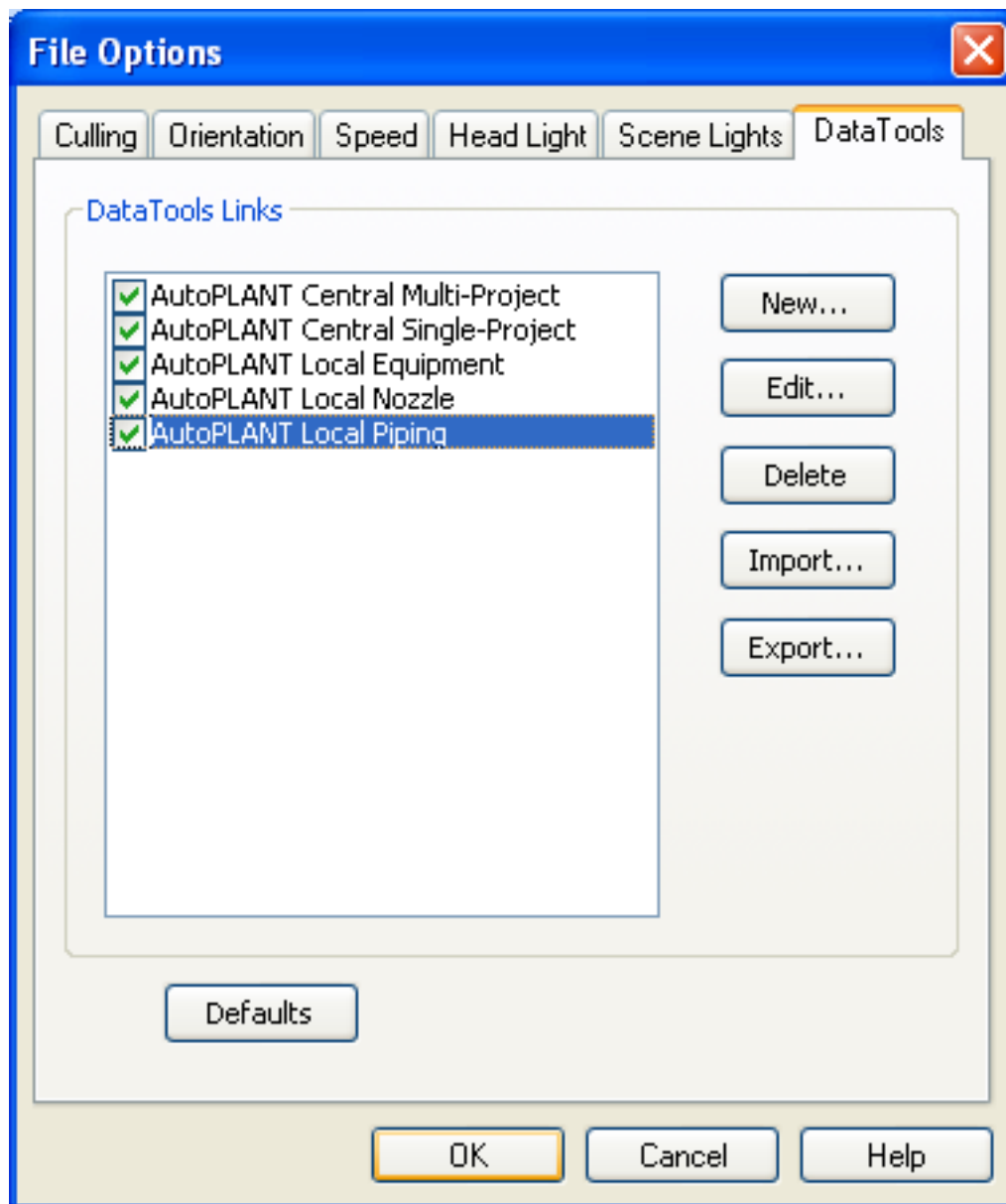
Bentley AutoPLANT Files

Bentley AutoPLANT is based on AutoCAD and as such uses the .dwg file format to store model geometry. Any settings related to the .dwg file format also affect files from AutoPLANT.

AutoPLANT Object Properties can be stored in external database .mdb files, and NavisWorks supports these files through the **DataTools** functionality. By default NavisWorks and DataTools are both set up to support AutoPLANT .dwg and .mdb files, and will be looking for Equipment, Nozzle and Piping Data.

Setting DataTools:

1. On the **Tools** menu, click **File Options**.
2. In the **File Options** dialog box, click the **DataTools** tab.



The settings for these three sets of data can be edited by selecting the appropriate item in the list and clicking on the **Edit** button. See [Chapter 25, DataTools](#) for more information.

For AutoPLANT properties to be loaded correctly an .mdb file must be located in the same directory as the .dwg file, with the same filename followed by the .mdb extension. If this file exists, NavisWorks will automatically pick it up and use it to show appropriate properties in the **Properties** window.

Note:

NavisWorks does not currently support per-project properties.

3DS Files

3DS is a common file format that is supported by many CAD applications. The NavisWorks file reader reads all 2D and 3D geometry as well as texture maps. The hierarchy defined by the keyframe data from keyframe 0 is preserved, including instancing. Entities are positioned based on keyframe 0.

Autodesk NavisWorks Review 2009 does not read .max files, but instead has exporters for Viz and Max. Entity support is the same as for the 3ds reader. See “[Viz and Max .nwc Exporter](#)” for more information.

Textures from .3DS files come through into NavisWorks Presenter, though you should bear in mind that .3DS files contain file names in the 8.3 DOS format only and that various formats are not yet supported in Presenter (see below).

Supported Entities

- All 2D and 3D geometry
- Cameras
- Groups
- Colors (from material color, not wireframe color - ambient, diffuse, shininess, transparency and self illumination)

Unsupported Entities

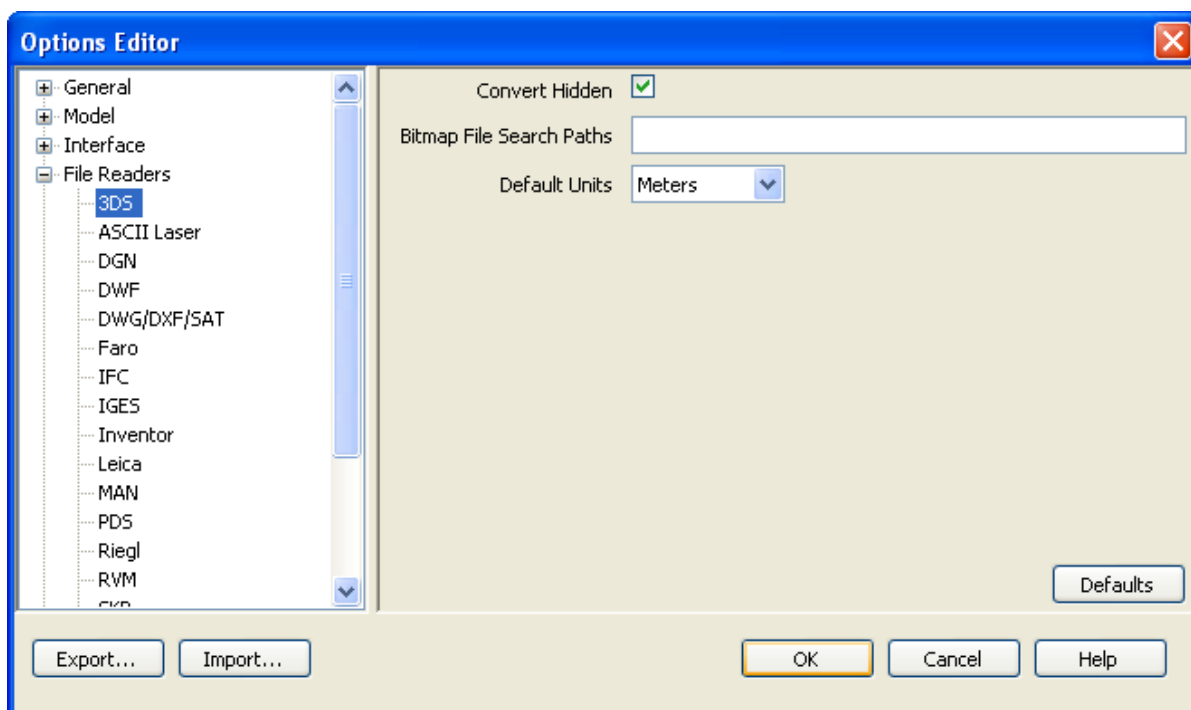
- Keyframes (objects are currently taken from keyframe 0)
- Texture maps in the formats: gray-scale .tga, .tif, .gif, .png.
- Other maps (e.g. opacity maps, reflections etc.)
- Wireframe meshes
- Lines, splines
- Points
- Background images

3DS File Reader Options

Setting the .3ds file reader options:

1. On the **Tools** menu, click **Global Options**.
2. Expand the **File Readers** node in the **Options Editor** dialog box, and click the **3DS** option.

The **3DS** page is displayed.



3. Select the **Convert Hidden** check box if you want to read hidden entities from the .3ds file. They will be converted but hidden in NavisWorks.
4. From the **Default Units** drop-down list, choose the type of units that NavisWorks will use when opening .3ds files. If the units turn out to be wrong, the model can be easily rescaled using the **File Transform** option (see [“Setting a File's Units and Transform”](#) for more details).
5. Click **OK** to set these options or **Cancel** to exit the dialog without setting them.

DGN and PRP Files

NavisWorks can read 3D .dgn and .prp files from Bentley's MicroStation, but does not support .cel files or 2D .dgn files. Reference files and instances of cells are respected and the selection tree reflects this file structure.

There is also an .nwc file exporter for MicroStation - see [“MicroStation .nwc Exporter”](#) for more details.

Note:

The reader supports files from MicroStation 95, SE and /J. It does not support MicroStation Modeller and any versions of MicroStation before 95.

The DGN reader additionally does not support auxiliary coordinate systems.

Supported Entities

- All 2D and 3D geometry including shapes, complex shapes, meshes, cones, surfaces, B-spline

boundaries, solids, SmartSolids and Feature Solids, lines, arcs and ellipses.

- Splines and B-spline curves.
- Lights.
- Levels.
- Cells and shared cells and their instancing.
- Colors and ambient, diffuse and shininess properties of materials from .pal and .mat palette and material files.
- Reference files including aliases.
- Dynamic drawing of parametric models when loading/exporting DGN and PRP files.
- 3D text used for notes and labels is now converted and displayed by default.
- Family, Part and Texture information from TriForma, and PDS object information from .drv files.
- DMRS and database linkage and association ID's.

Unsupported Entities

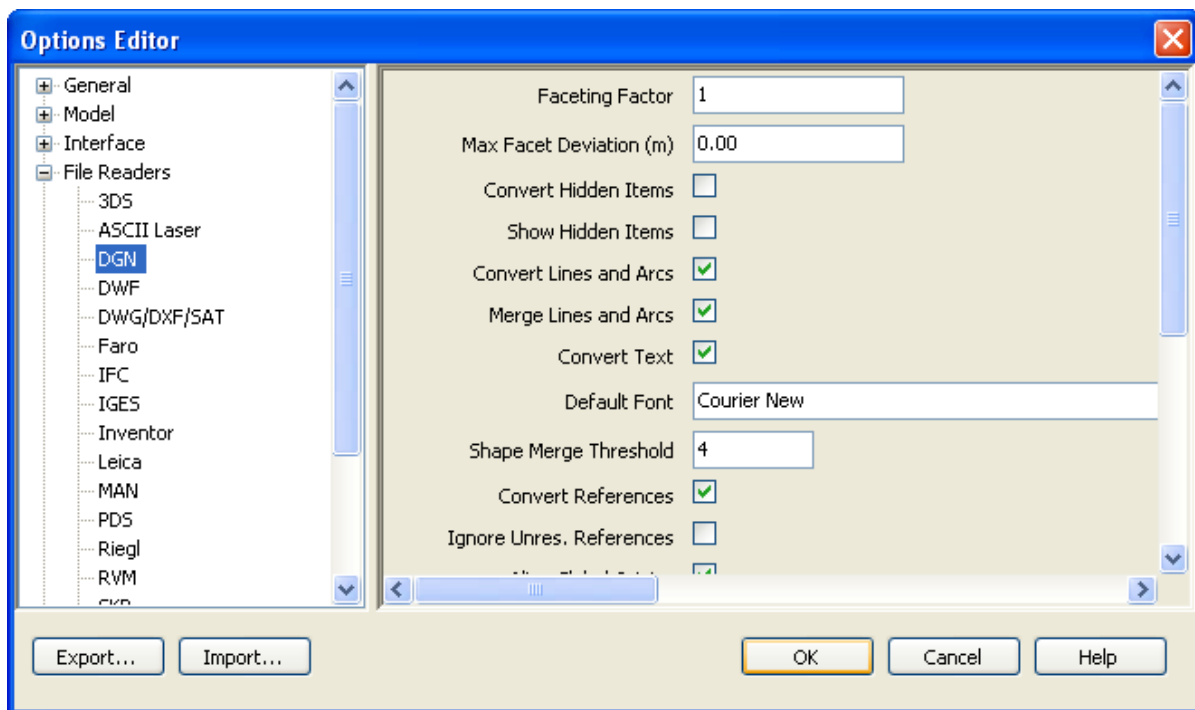
- Raster bitmaps.
- Dimensions and leaders.

DGN File Reader Options

Setting the .dgn file reader options:

1. On the **Tools** menu, click **Global Options**.
2. Expand the **File Readers** node in the **Options Editor** dialog box, and click the **DGN** option.

The **DGN** page is displayed.



3. Enter the **Faceting Factor** (the value must be greater than 0). The higher the value, the more NavisWorks will facet rounded entities and therefore the smoother they will appear. See [Faceting Factor](#) for more information.
4. Enter the **Max Facet Deviation**. This will facet entities to within the specified tolerance. See [Max Facet Deviation](#) for more information.
5. Select the **Convert Hidden Items** check box if you want to read hidden entities from the .dgn file. They will be converted but hidden in NavisWorks.
6. Select the **Show Hidden Items** check box if you want to show all entities in the .dgn file whether they are set as hidden or not. This option will only work if **Convert Hidden Items** is also selected.
7. Select the **Convert Lines and Arcs** check box if you want to read lines, splines, curves, arcs, circles or ellipses from the .dgn file.
8. Select the **Merge Lines and Arcs** check box if you want to reduce the complexity of the model as seen in the selection tree by interpreting adjoining lines etc. with the same color, level and parent as a single item. Clear this check box if you want to leave these elements as separate items in NavisWorks.
9. Select the **Convert Text** check box if you want to read text from the .dgn file. Text will be converted into smart tags in NavisWorks.
10. Enter the **Shape Merge Threshold** into the box. See [Shape Merge Threshold](#) for more information on Shape Merge Threshold.
11. Select the **Convert References** check box if you want to read reference files from the .dgn file.
12. Select the **Ignore Unres. References** check box if you want to ignore unresolved reference files from the .dgn file. If this check box is cleared, then you will be presented with a dialog to find any unresolved reference files at a run time.

13. Select the **Use Level Symbology** check box if you want to use the level symbology from MicroStation so that items in NavisWorks take their color from level rather than the default element color in MicroStation.
14. MicroStation has the concept of a “global origin”, which is where (0, 0, 0) is located (assuming there are no active ACSs). Changing this global origin in MicroStation doesn't actually move anything; it simply changes the reporting of coordinates. However, when attaching references in MicroStation, you can tell it to align global origins.

Select the **Align Global Origins** check box if you want to use this functionality when loading DGN files into NavisWorks. When two DGN files are appended together with this check box selected, their global origins will be in the same place.
15. Enter a semi-colon separated list of paths in **Material Search Paths** that the reader will search in for MicroStation palette (.pal) and material (.mat) files in order to convert its materials.
16. Select the **Convert PDS Data** check box if you want to read object information from Intergraph's Plant Design System™ while reading the .dgn files. PDS information is read from Intergraph's .drv files. NavisWorks looks for a .drv file with the same base name as the .dgn file in the same directory.
17. Select the **Convert TriCAD Data** check box if you want to read object information from Triplan's TriCAD™ while reading the .dgn files.
18. Select the **Convert TriForma Data** check box if you want to read object information from Bentley's TriForma™ while reading the .dgn files.
19. Enter a semi-colon separated list of paths in **TriForma Dataset Search Paths** that the reader will search for Triforma data set files. User defined datasets will need their directories adding to this list.
20. Enter a **View Number** if you want to use a specific view for loading. The loader will use the level visibility of this view when converting items. If you want to use the first active view, set this value to 0.
21. Click **OK** to set these options or **Cancel** to exit the dialog without setting them.

MAN Files

NavisWorks can read .man files from Informatix's MicroGDS™ version 6.0 or later. MicroGDS™ projects are not supported. The workaround is to first export the desired project window as a .man file.

MicroGDS Renderer materials are shown in their flat-shaded colors in NavisWorks Shaded display. In Full Render or Presenter rendering, the full shaders are used. Only the standard LightWorks shaders are available - those which are unique to MicroGDS are not available inside NavisWorks - a compromise is made for shaders which are not available inside NavisWorks.

- **height band** color shader is treated as plain grey
- **wrapped random** color shader is treated as a plain color using the flat-shaded color from MicroGDS
- **wrapped stencil** transparency is ignored
- **undulate**, **wrapped brick**, **wrapped grid** and **wrapped ripple** displacement shaders are ignored
- **object axis** texture space is equivalent to the NavisWorks **Box** texture space
- **auto axis** and **object xy axis** texture spaces are treated as a **Box** texture space

- **grid** background is treated as a plain background using the **background color** - no grid lines will show
- Foreground and Environment shaders are ignored
- All other shaders, as of MicroGDS 7.2, are correctly imported into NavisWorks.

Note:

MicroGDS materials are specified in millimetres, and are converted into metres to make NavisWorks materials, dividing distance parameters by 1000. Windows with Perspective Views are read into NavisWorks as View objects.

Windows with Perspective Views are read into NavisWorks as Saved Viewpoints.

Supported Entities

- Clump primitives.
- Line primitives. The color of line primitives is determined by the first phase in which they appear in the Principal Window. If they are not included in the Principal Window, they will have a color determined by their style.
- Light styles. Projector lights are treated as a Spot light without the transparent image.
- Material styles, both plain and most LightWorks Renderer materials. Materials using wrapped images locate their image files using the "Texture Path" specified below.
- Views. Perspective Views are read in as if 3-point Perspective; parallel Views are not read. A Section Plane in a MicroGDS View is set in the corresponding NavisWorks View.
- Layers. All layers are read, and made visible according to their status in the Principal Window of the MAN file.
- Instances.
- Object data structure.

Unsupported Entities

- Text primitives.
- Photo primitives.

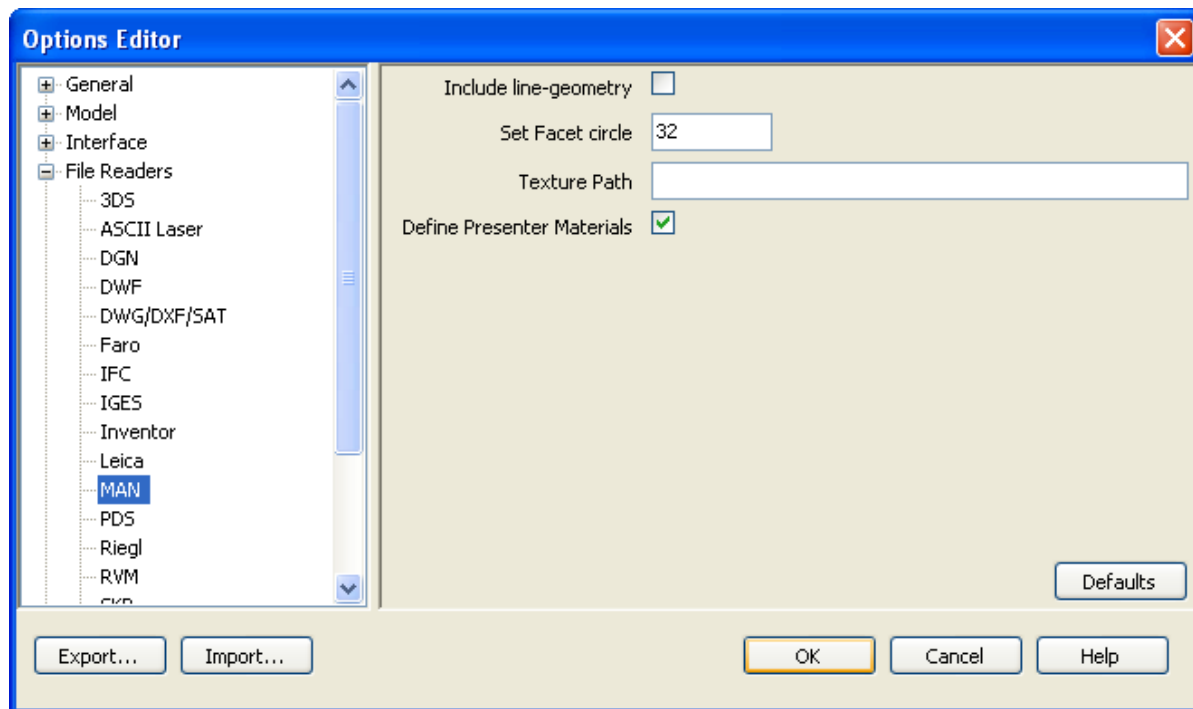
MAN File Reader Options

Setting the MAN file reader options:

1. On the **Tools** menu, click **Global Options**.

- Expand the **File Readers** node in the **Options Editor** dialog box, and click the **MAN** option.

The **MAN** page is displayed.



- Select the box **Include line-geometry** to include MicroGDS line-primitives into NavisWorks
- Set Facet circle.** Adjust the number of facets used for arcs - enter the number of straight line segments to facet a whole circle. (This corresponds to the MicroGDS **Set Facet** preference.)
- Texture Path.** Enter the path to the folder containing images used in MicroGDS Materials. Materials using image files will use this string as the base for relative paths. (This corresponds to the MicroGDS **Renderer Textures** preference.)
- Select the **Define Presenter Materials** check box if you wish MicroGDS material-styles to be defined as NavisWorks Presenter materials.
- Click **OK** to set these options or **Cancel** to exit the dialog without setting them.

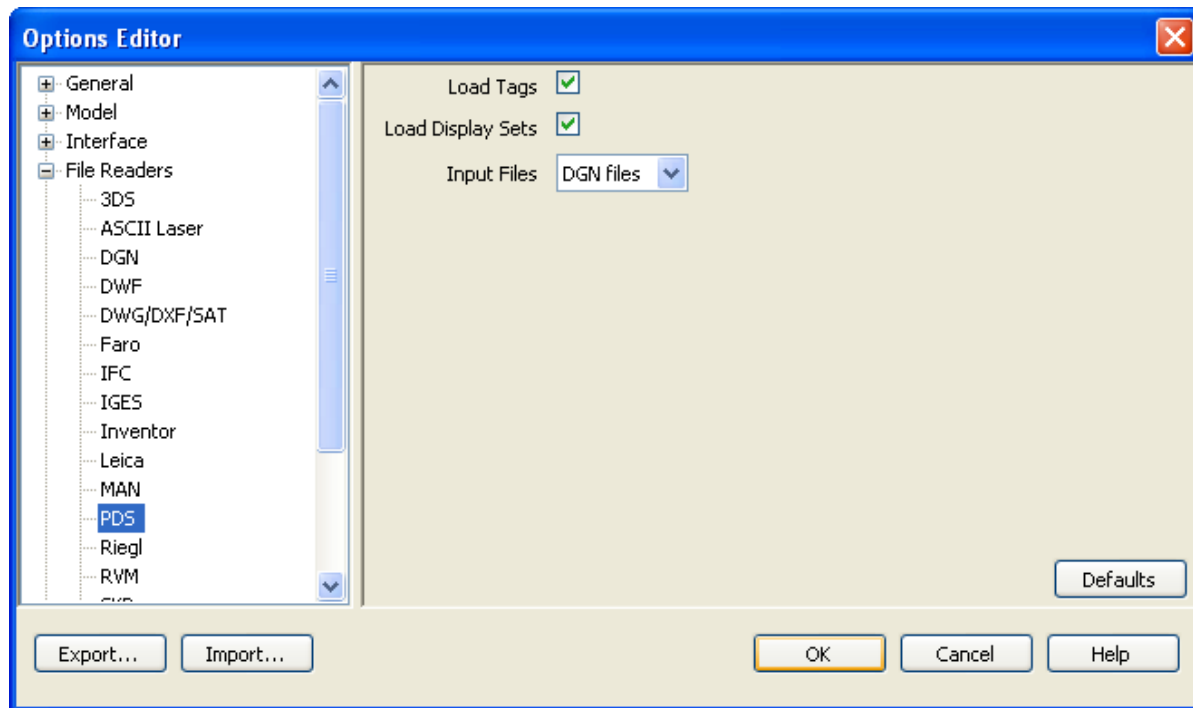
PDS Files

NavisWorks allows you to load DRI files from the PDS Design Review package.

Setting the PDS file reader options:

- On the **Tools** menu, click **Global Options**.
- Expand the **File Readers** node in the **Options Editor** dialog box, and click the **PDS** option.

The **PDS** page is displayed.



3. Select the **Load Tags** check box to load associated TAG files together with the DRI file.
4. Select the **Load Display Sets** check box to load associated Display Set DST files with the DRI file.
5. In the **Input Files** drop-down box select **DGN Files** to read the original DGN files, or **NWC Files** to load the NWC cache versions of the files instead.

The last option is useful if you routinely perform a batch conversion of the DGN files into NWC files, and would like to load the NWC files when reading a DRI file.

6. Click **OK** to set these options or **Cancel** to exit the dialog without setting them.

IGES Files

NavisWorks uses the Open CASCADE libraries to read and tessellate .igs and .iges files up to and including IGES 5.3.

Supported Entities

- Groups
- Colors
- Planes
- Parametric spline, ruled, B-spline, offset, bounded, trimmed and plane surfaces and surfaces of

revolution.

- Tabulated cylinders
- Solids and manifold solids
- Shells
- Faces

Unsupported Entities

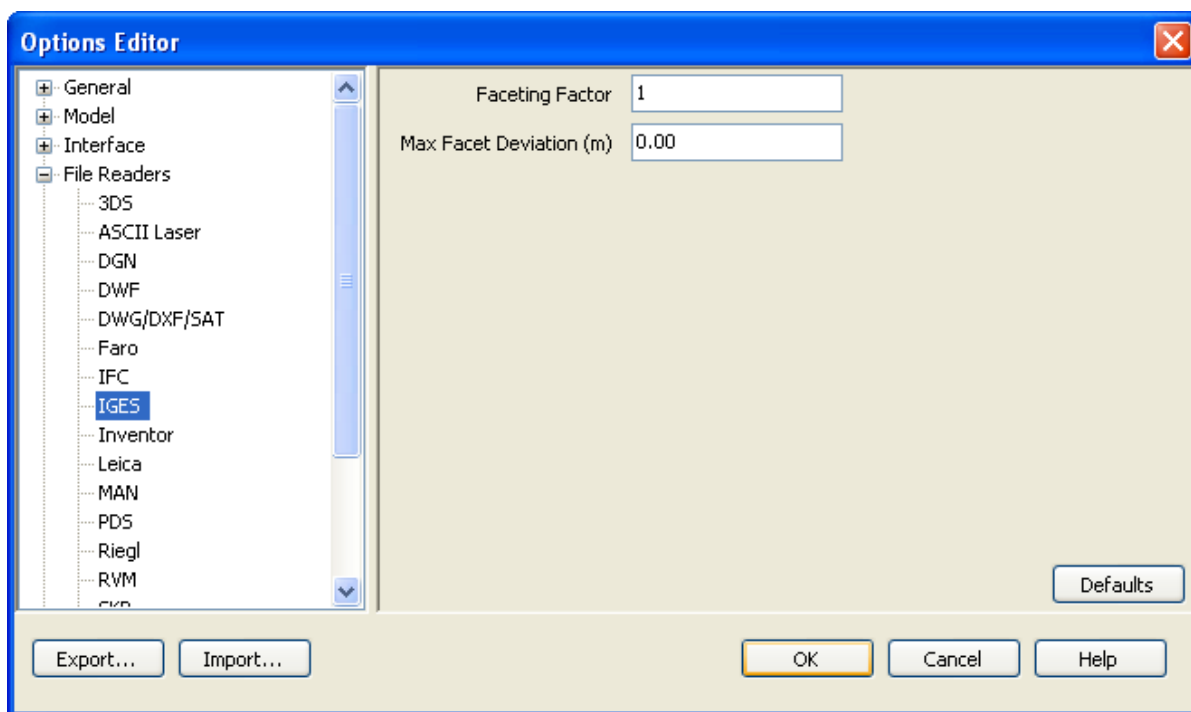
- Points
- Lines
- Circular or conic arcs
- Composite, parametric spline, B-spline, or offset curves
- Boundaries
- Attributes

IGES File Reader Options

Setting the IGES file reader options:

1. On the **Tools** menu, click **Global Options**.
2. Expand the **File Readers** node in the **Options Editor** dialog box, and click the **IGES** option.

The **IGES** page is displayed.



3. Enter the **Faceting Factor** (the value must be greater than 0). The higher the value, the more NavisWorks will facet rounded entities and therefore the smoother they will appear. See [Faceting Factor](#) for more information.
4. Enter the **Max Facet Deviation**. This will facet entities to within the specified tolerance. See [Max Facet Deviation](#) for more information.
5. Click **OK** to set these options or **Cancel** to exit the dialog without setting them.

STEP Files

NavisWorks uses the Open CASCADE libraries to read and tessellate .stp and .step files up to and including AP214 CC2 and AP203.

Supported Entities

- Assemblies
- Colors
- Planes
- B-spline and rational B-spline, Bezier, conical, cylindrical, offset, rectangular trimmed, linear extrusion, bounded, manifold, spherical, toroidal, uniform and quasi-uniform, surfaces.
- Shells
- Advanced and faceted boundary representations (BReps)

Unsupported Entities

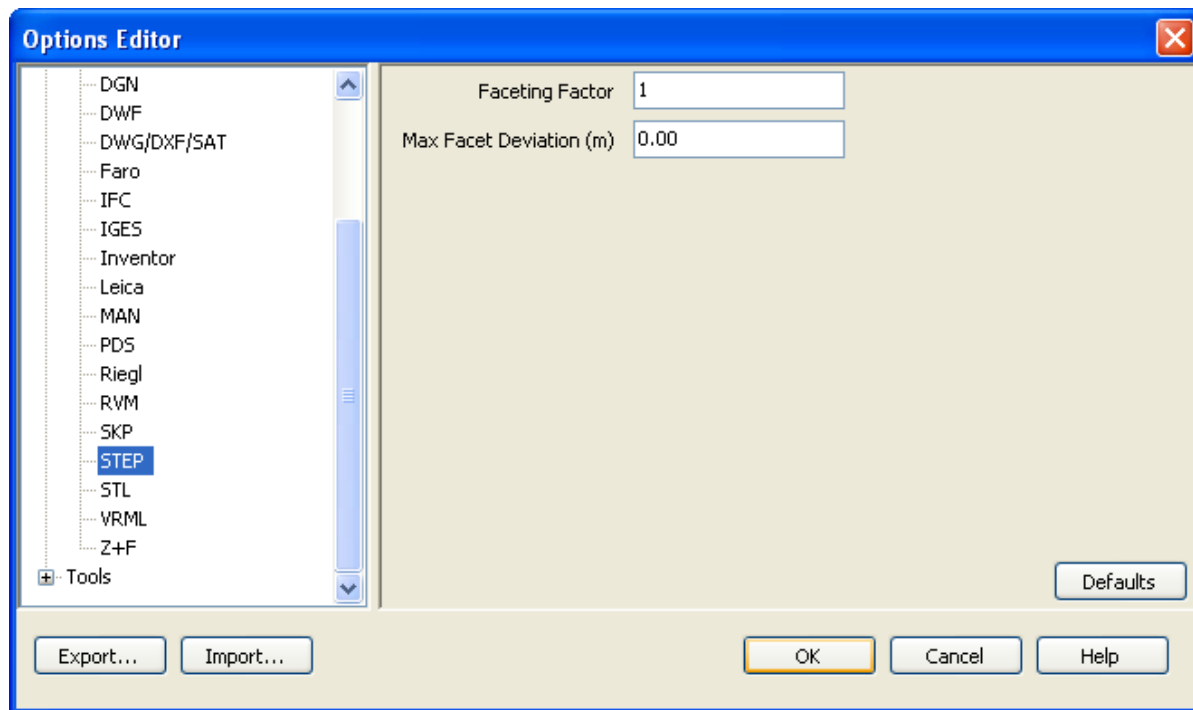
- Points
- PCurves, B-spline, rational B-spline, Bezier, trimmed, uniform or quasi-uniform curves.
- Circles or ellipses
- Hyperbola

STEP File Reader Options

Setting the STEP file reader options:

1. On the **Tools** menu, click **Global Options**.
2. Expand the **File Readers** node in the **Options Editor** dialog box, and click the **STEP** option.

The **STEP** page is displayed.



3. Enter the **Faceting Factor** (the value must be greater than 0). The higher the value, the more NavisWorks will facet rounded entities and therefore the smoother they will appear. See [Faceting Factor](#) for more information.
4. Enter the **Max Facet Deviation**. This will facet entities to within the specified tolerance. See [Max Facet Deviation](#) for more information.
5. Click **OK** to set these options or **Cancel** to exit the dialog without setting them.

Inventor Files

Autodesk Inventor™ part (.ipt), assembly (.iam) and project (.ipj) files can be read by NavisWorks. Drawing (.idw) files cannot be read.

Note:

The reader supports files from Autodesk Inventor 2009™ and earlier. Later versions should also work, but haven't been tested. Autodesk Inventor 5™ (or higher) or Autodesk Inventor Design Tracking 5™ (or higher) must be installed. Autodesk Inventor Design Tracking™ can be downloaded from support.autodesk.com.

Supported Entities

- All geometry
- Assembly structure

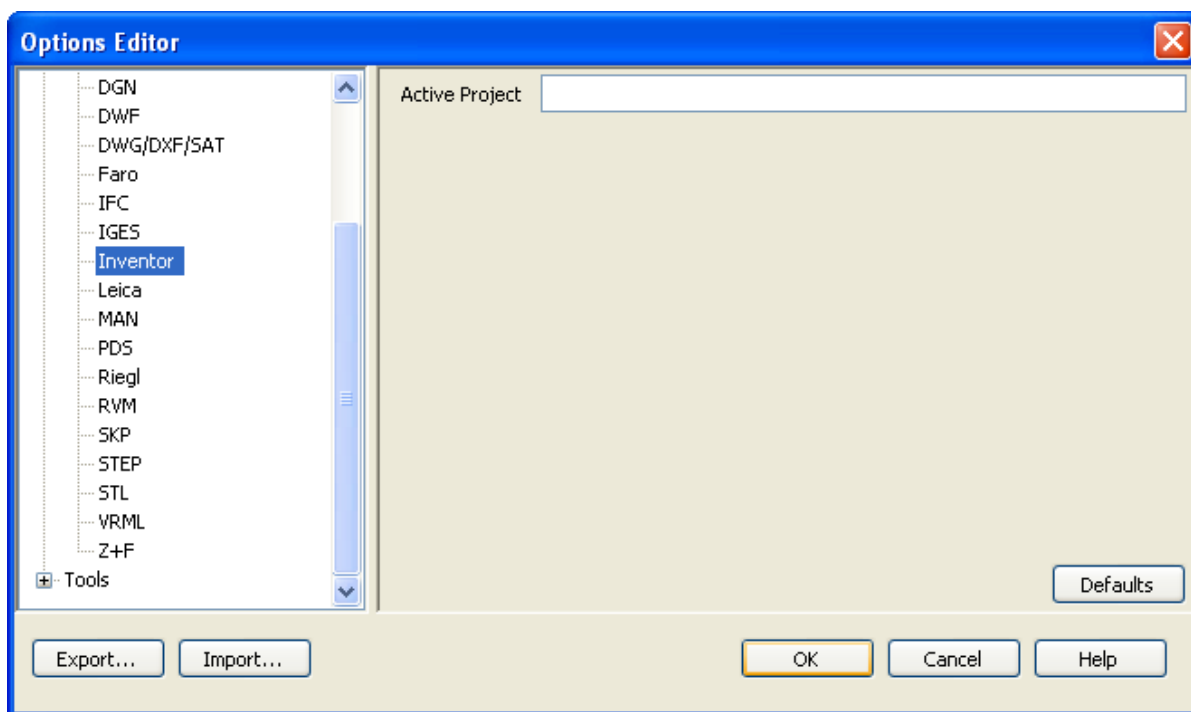
Unsupported Entities

- Material names

Inventor File Reader Options

Setting the Inventor file reader options:

1. On the **Tools** menu, click **Global Options**.
2. Expand the **File Readers** node in the **Options Editor** dialog box, and click the **Inventor** option.
The **Inventor** page is displayed.



3. The **Active Project** text box displays the path of the current Inventor project. To change project, open the corresponding project file or enter the path to it here.
4. Click **OK** to set these options or **Cancel** to exit the dialog without setting them.

VRML world files

VRML world files can be read by NavisWorks.

Note:

The reader supports files in both VRML1 and VRML2 file formats.

Supported Entities

- All 3D geometry including cuboids, cylinders, cones, spheres, elevation grids, extrusions, face and line sets, and points.
- All grouping nodes - however some limitations exist on certain types of group node (see below).

Partially Supported Entities

- VRML2 Billboard nodes - children will be loaded but no billboarding will take place.
- VRML2 Collision nodes - children will be loaded but no specification of collision detection occurs.

- VRML1 WWWAnchor and VRML2 Anchor nodes - children will be loaded but any referenced VRML world will not be loaded upon clicking objects.
- VRML1 and VRML2 LOD nodes - the most detailed (i.e. first) child will always be loaded.

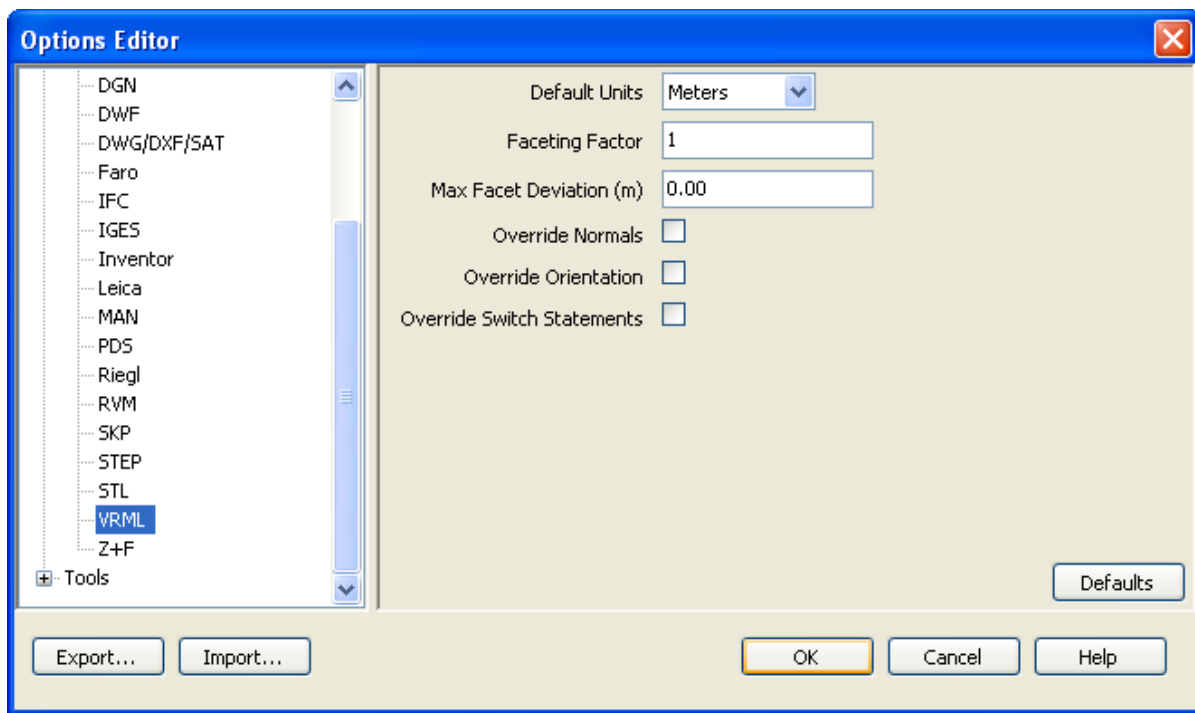
Unsupported Entities

- All ROUTE definitions.
- All sensor nodes.
- All interpolator nodes.
- Textures specified within the VRML file (VRML2 PixelTexture nodes and the image component of VRML1 Texture2 nodes).
- VRML2 Script nodes.
- VRML2 MovieTexture nodes.
- VRML2 Fog nodes.
- VRML2 AudioClip and Sound nodes.
- All text-related nodes (VRML1 AsciiText and VRML2 Text nodes, and FontStyle nodes).

VRML File Reader Options

Setting the VRML file reader options:

1. On the **Tools** menu, click **Global Options**.
2. Expand the **File Readers** node in the **Options Editor** dialog box, and click the **VRML** option.
The **VRML** page is displayed.



3. Use the **Default Units** drop-down list to alter the default units for any loaded VRML world.
4. Select the **Override Normals** check box if you want to override any provided normals and force auto-generation within NavisWorks.
5. Select the **Override Orientation** check box if you want to override any specified orientation of vertices and force all to be assumed to be counter-clockwise.
6. Select the **Override Switch Statements** check box if you want to override the standard behavior of switch statements. Often VRML authors will use switch statements to contain geometry selectable by scripts. Since Navisworks has no support for scripting, this option will allow some aspect of that geometry to be exposed, although results are unlikely to be precisely as the author intended.
7. Click **OK** to set these options or **Cancel** to exit the dialog without setting them.

Riegl Scan Files

Riegl™ scan files can be read by NavisWorks.

Note:

The reader supports files from all Riegl™ LMS scanners.

Supported Entities

- Points

- Triangles

Unsupported Entities

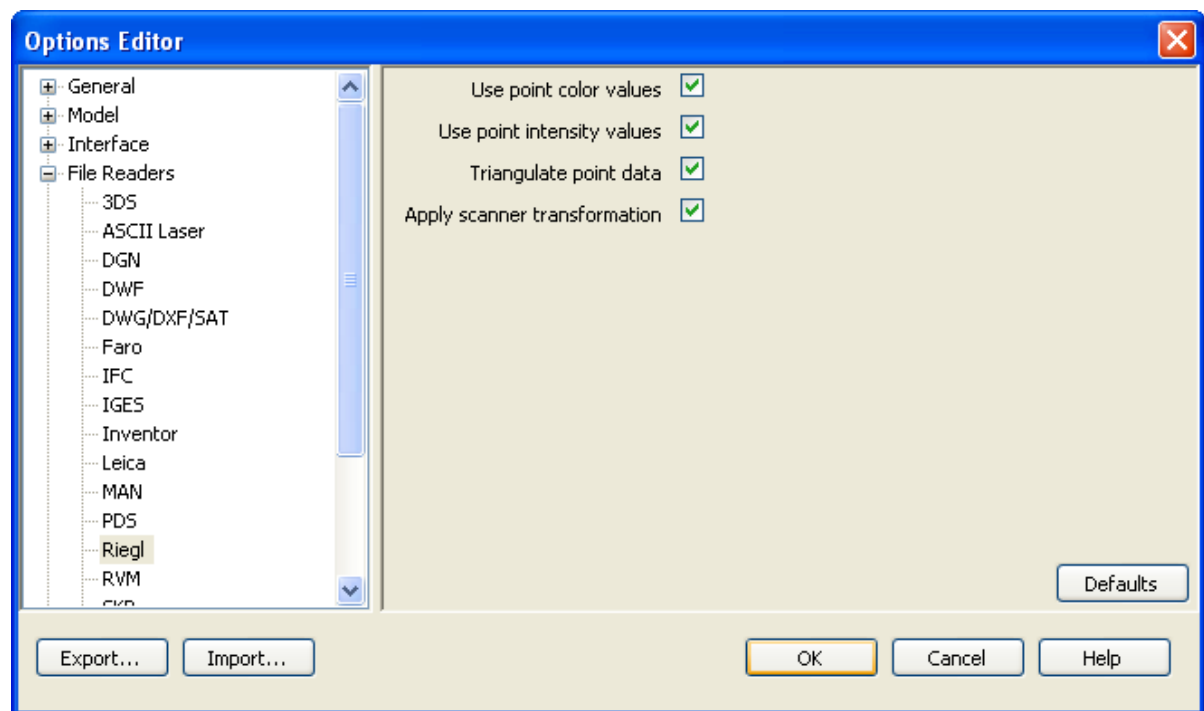
- No other entities are supported.

Riegl Scan File Reader Options

Setting the Riegl Scan file reader options:

1. On the **Tools** menu, click **Global Options**.
2. Expand the **File Readers** node in the **Options Editor** dialog box, and click the **Riegl** option.

The **Riegl** page is displayed.



3. Select the **Use point color values** check box if you want to extract color values from the input file.
4. Select the **Use point intensity values** check box if you want to extract intensity values from the input file.
5. Select the **Triangulate point data** check box if you want to extract triangles from the input file. The file will take much longer to load.
6. Select the **Apply scanner transformation** check box if you want to display the image in global coordinates (necessary when the file contains more than one frame) or in local coordinates, relative

to the scanner.

7. Click **OK** to set these options or **Cancel** to exit the dialog without setting them.

Faro Scan Files

Faro™ scan files can be read by NavisWorks. iQmod and iQwsp files are workspace files that contain a list of one or more associated iQscan files. The iQscan files must be located in a folder called 'Scans', located in the same directory as the workspace file.

Note:

The reader supports files from all Faro™ scanners.

Supported Entities

- Points

Unsupported Entities

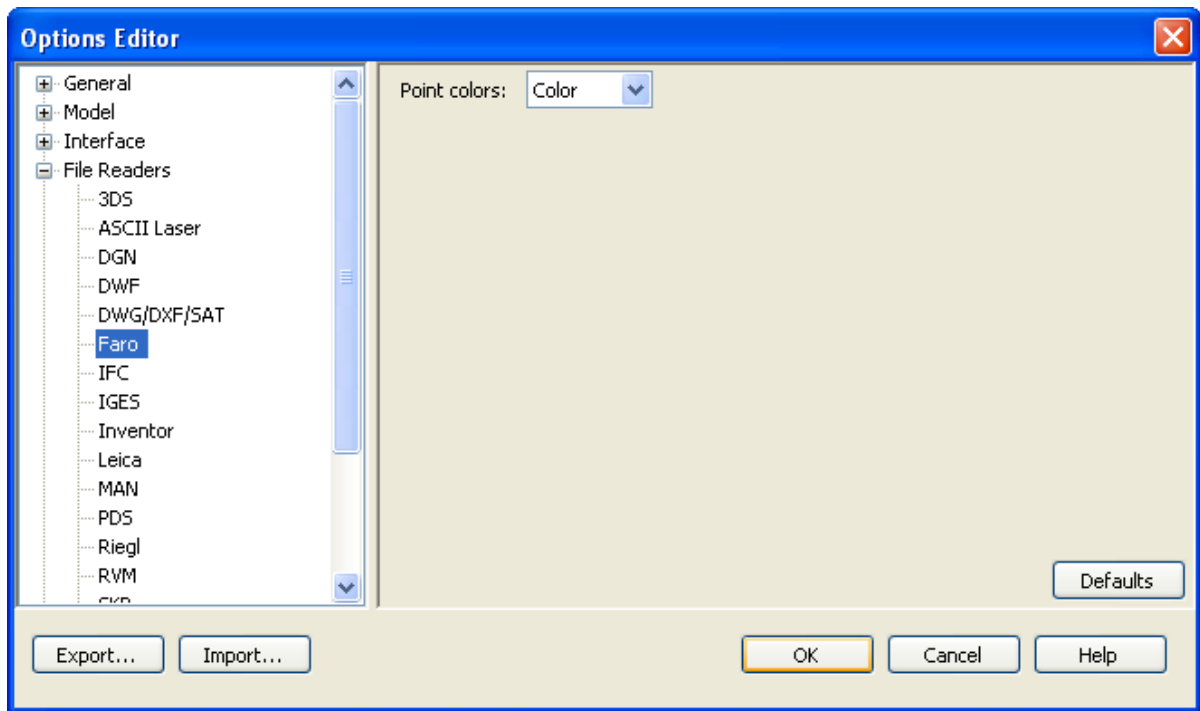
- No other entities are supported.

Faro Scan File Reader Options

Setting the Faro Scan file reader options:

1. On the **Tools** menu, click **Global Options**.
2. Expand the **File Readers** node in the **Options Editor** dialog box, and click the **Faro** option.

The **Faro** page is displayed.



3. **Point colors** for Faro files can be set to **None** where the points come through as white, and **Intensity** and **Color** where the points use the intensity or color values stored in the file.

It should be noted that if **Point colors** is set to a higher level in the Global Options than are available in the file, then it will default to the highest available within the file. So for example if the **Point colors** are set to color, but only intensities are available in the file, intensities will be shown in the main view.

4. Click **OK** to set these options or **Cancel** to exit the dialog without setting them.

Leica Scan Files

Leica™ scan files can be read by NavisWorks.

Note:

The reader supports files from all Leica™ HDS scanners.

Supported Entities

- Points

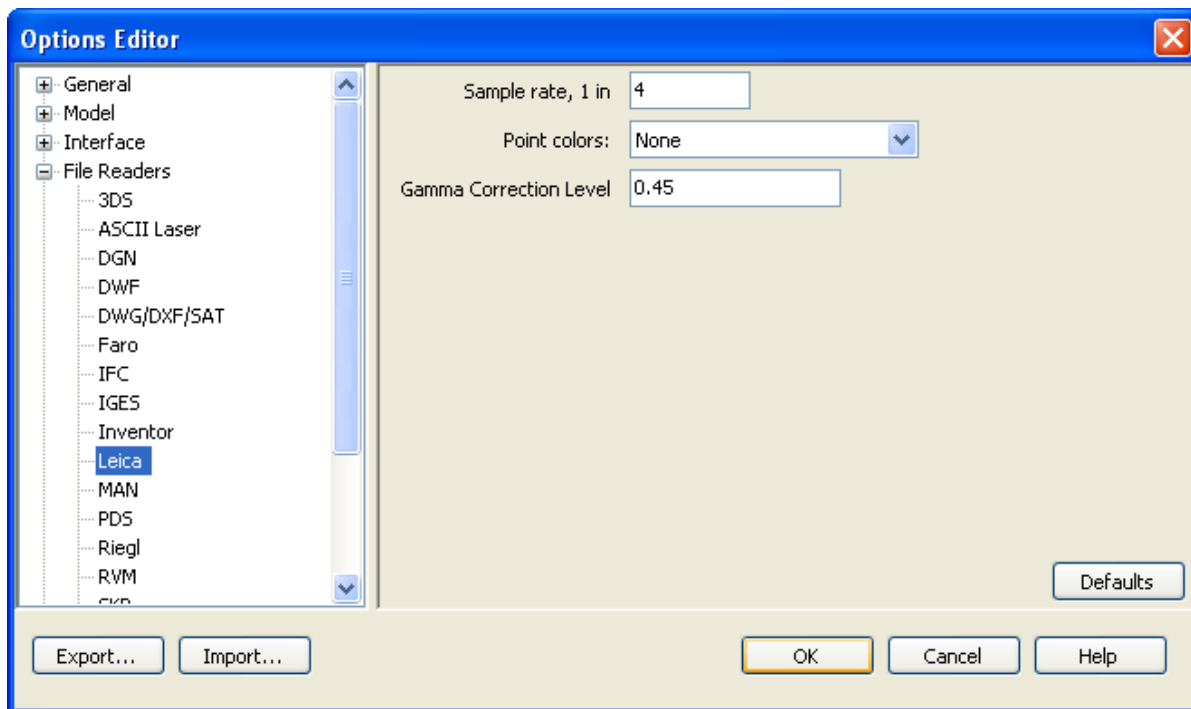
Unsupported Entities

- No other entities are supported.

Leica Scan File Reader Options

Setting the Leica Scan file reader options:

1. On the **Tools** menu, click **Global Options**.
 2. Expand the **File Readers** node in the **Options Editor** dialog box, and click the **Leica** option.
- The **Leica** page is displayed.



3. Set the value in the **Sample rate** box if you want to adjust the frequency of points extracted from the input file. By increasing the rate, the number of points extracted will be reduced. This will have the effect of reducing the image resolution, but increasing the speed with which the file is loaded.
4. From the **Point colors** drop-down list, choose how the points are brought through when opening Leica files. **None** brings through the points set to white. **Raw Intensities** uses the intensities set in the file. **Color** uses the color settings in the file. **Color-Mapped Intensity** transforms point intensity values to a spectrum of RGB colors. The **Gamma Correction Level** is used to alter the gamma correction values whilst using the point intensities set in the file. Gamma values can range between 0.0 and 1.0 are useful to correct weighting of intensity values at the lower end of the intensity range.
5. Click **OK** to set these options or **Cancel** to exit the dialog without setting them.

Z+F Scan Files

Z+F™ scan files can be read by NavisWorks.

Note:

The reader supports files from all Z+F™ IMAGER scanners.

Supported Entities

- Points

Unsupported Entities

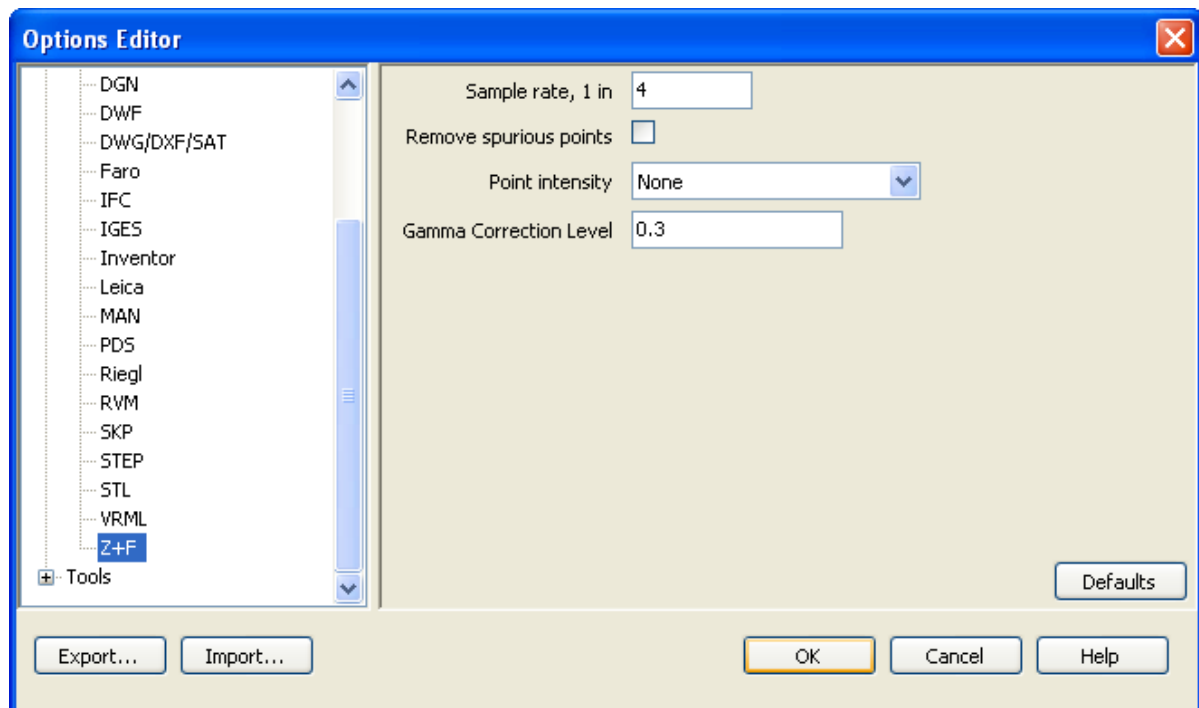
- No other entities are supported.

Z+F Scan File Reader Options

Setting the Z+F Scan file reader options:

1. On the **Tools** menu, click **Global Options**.
2. Expand the **File Readers** node in the **Options Editor** dialog box, and click the **Z+F** option.

The **Z+F** page is displayed.



3. Set the value in the **Sample rate** box if you want to adjust the frequency of points extracted from the input file. By increasing the rate, the number of points extracted will be reduced. This will have the effect of reducing the image resolution, but increasing the speed with which the file is loaded.
4. Select the **Remove spurious points** check box if you want to ignore spurious points in the input file.

- From the **Point intensity** drop-down list, choose how the points are brought through when opening Z+F files. **None** brings through the points set to white. **Raw Intensities** uses the intensities set in the file. **Color-Mapped Intensity** transforms point intensity values to a spectrum of RGB colors. The **Gamma Correction Level** is used to alter the gamma correction values whilst using the point intensities set in the file. Gamma values can range between 0.0 and 1.0 are useful to correct weighting of intensity values at the lower end of the intensity range.
- Click **OK** to set these options or **Cancel** to exit the dialog without setting them.

ASCII Laser Scan Files

ASCII Laser Scan files can be read by NavisWorks.

Note:

Most scanner software allows the user to export the point data in an ASCII text file. Providing that the data is saved in the correct format, this data can be read by NavisWorks.

Supported formats for ASCII laser scan data are listed below. The data must be separated using one of the following characters: comma, tab or space. The character used to signify a decimal must be a point (period).

- X, Y, Z
- X, Y, Z, Intensity
- X, Y, Z, Red, Green, Blue
- X, Y, Z, Intensity, Red, Green, Blue

Intensity values are integers in the range 0-255 (Note: These will not be gamma corrected). Red, Green and Blue values are also integers in the range 0-255.

Supported Entities

- Points

Unsupported Entities

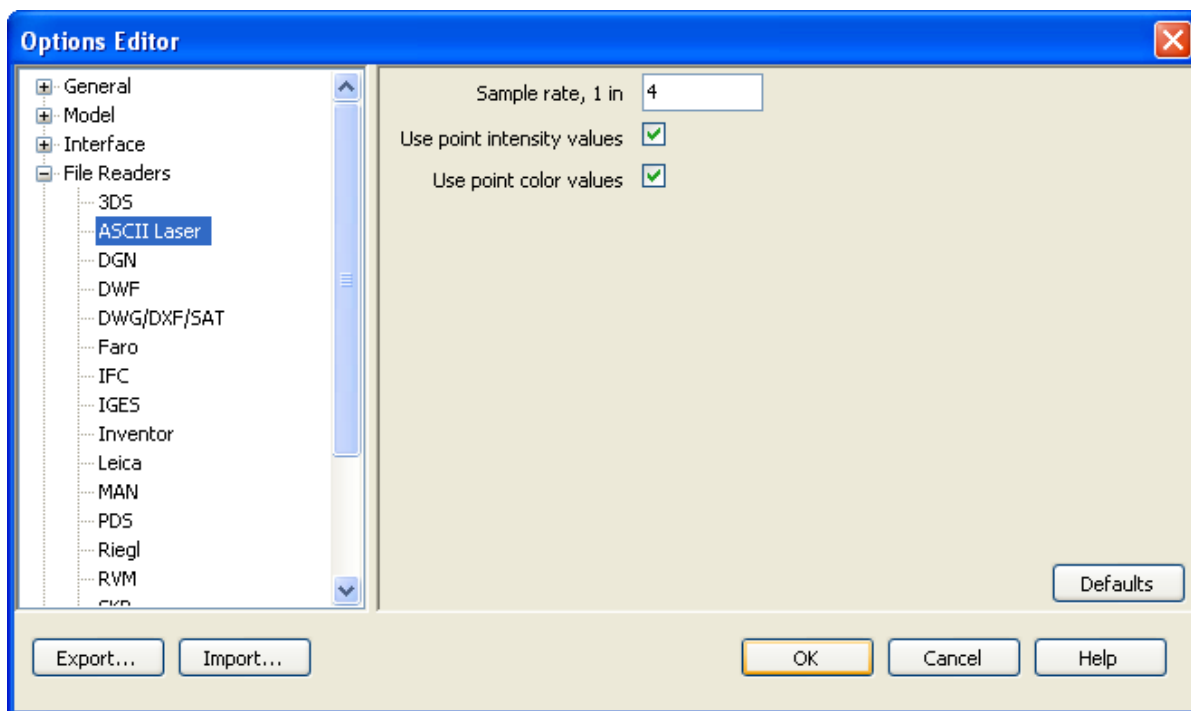
- No other entities are supported.

ASCII Laser Scan File Reader Options

Setting the ASCII Laser Scan file reader options:

- On the **Tools** menu, click **Global Options**.

- Expand the **File Readers** node in the **Options Editor** dialog box, and click the **ASCII Laser** option.
The **ASCII Laser** page is displayed.



- Set the value in the **Sample rate** box if you want to adjust the frequency of points extracted from the input file. By increasing the rate, the number of points extracted will be reduced. This will have the effect of reducing the image resolution, but increasing the speed with which the file is loaded.
- Select the **Use point intensity values** check box if you want to extract intensity values from the input file.
- Select the **Use point color values** check box if you want to extract color values from the input file.
- Click **OK** to set these options or **Cancel** to exit the dialog without setting them.

STL Stereolithography files

STL™ stereolithography files can be read by NavisWorks.

Note:

The reader only supports binary files. ASCII versions are unsupported.

Supported Entities

- Triangles

Unsupported Entities

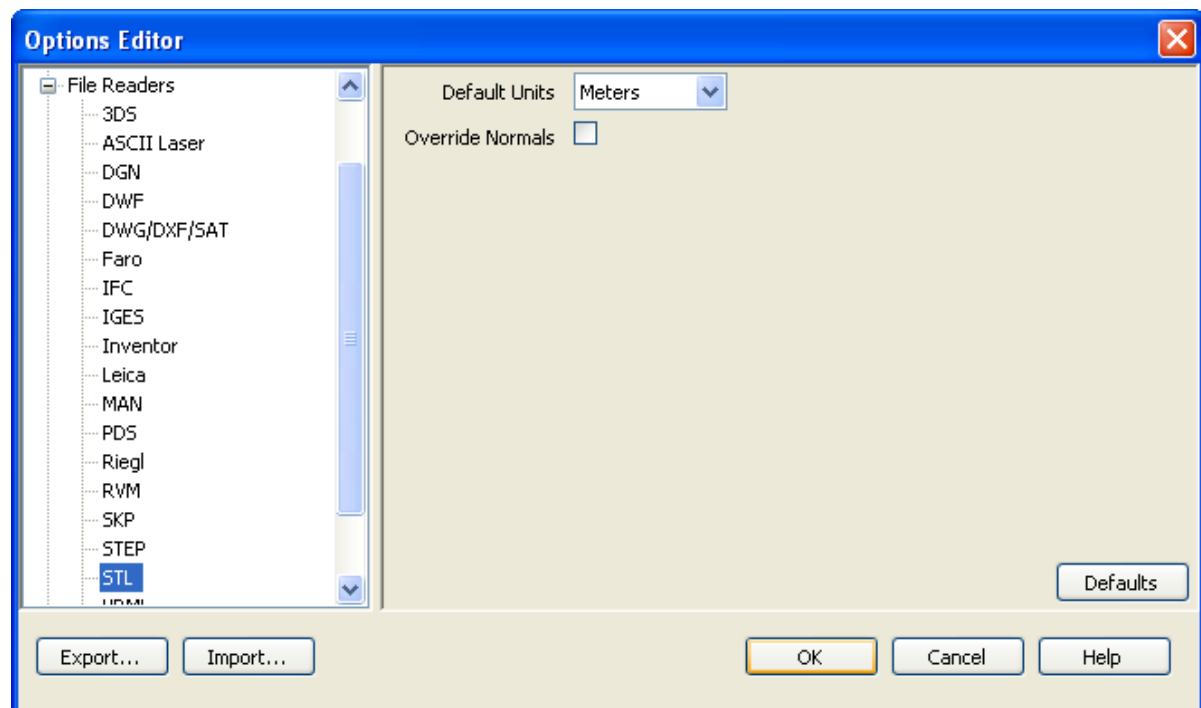
- No other entities are supported.

STL File Reader Options

Setting the STL file reader options:

1. On the **Tools** menu, click **Global Options**.
2. Expand the **File Readers** node in the **Options Editor** dialog box, and click the **STL** option.

The **STL** page is displayed.



3. Use the **Default Units** drop-down list to alter the default units for any loaded STL solid.
4. Select the **Override Normals** check box if you want to override any provided normals and force auto-generation within NavisWorks.
5. Click **OK** to set these options or **Cancel** to exit the dialog without setting them.

AVEVA Review™ RVM and RVS files

The NavisWorks RVM Reader can read both binary and ASCII .rvm files exported from AVEVA's PDMS™ product. Attribute files are supported, output using either the "Dump Attributes" or "Data1" (also called "OUTPUT") formats, with the file extensions .att, .attrib and .txt. RVS files are also supported.

Supported Entities

- All geometry
- Attributes stored on groups
- Textures (via RVS file)
- Cameras and camera tracks (via RVS file)
- Clip planes (via RVS file)
- Signs (via RVS file)
- Tags (via RVS file)
- Labels (via RVS file)
- Translucency (via RVS file)

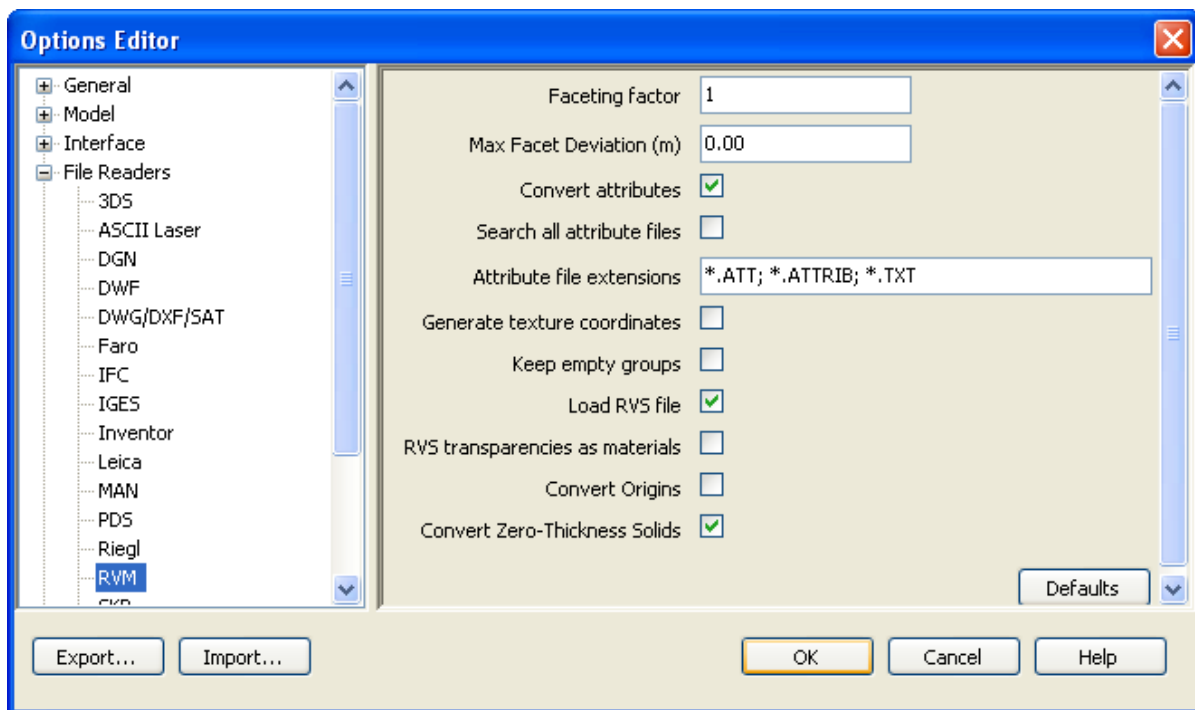
Unsupported Entities

- Attributes stored on primitives
- Lights
- Object Animation
- Smooth Animation
- Groups
- Autotags

RVM File Reader Options

Setting the RVM file reader options:

1. On the **Tools** menu, click **Global Options**.
2. Expand the **File Readers** node in the **Options Editor** dialog box, and click the **RVM** option.
The **RVM** page is displayed.



3. Enter the **Faceting Factor** (the value must be greater than 0). The higher the value, the more NavisWorks will facet rounded entities and therefore the smoother they will appear. See [Faceting Factor](#) for more information.
4. Enter the **Max Facet Deviation**. This will facet entities to within the specified tolerance. See [Max Facet Deviation](#) for more information.
5. Select the **Convert attributes** check box to attempt to load attribute files.
6. Select the **Search all attribute files** check box to affect how attribute files are looked for and loaded.

If unchecked, the reader firstly looks for an attribute file with the same name as the RVM file in the same directory, followed by all attribute files contained within any subdirectory with the same name as the RVM file. The attribute file extensions searched are listed in the **Attribute file extensions** box.

If the **Search all attribute files** check box is selected, the reader looks for a file using the method above, but also tries all attribute files in the same directory as the RVM irrespective of filename.

7. **Attribute file extensions** lists all extensions that will be considered for attribute conversion. This can be edited and added to where necessary.

Note:

Using **Dump Attributes** may not bring through all attribute data. If more than one database is used in the project, it is recommended that attributes be exported using the **Datal** method.

8. Select the **Generate texture coordinates** check box to create texture coordinates for each point in the model. This will affect how textures are applied to the geometry.
9. Select the **Keep empty groups** check box to keep any groups in RVM file that do not contain

geometry. If unchecked, such groups will be discarded.

Note:

RVM files do not contain color information beyond a color number on each scene element. As these colors are customisable; NavisWorks provides a color definition file to allow easy color personalisation.

Two examples of this file are located in the RVM subdirectory inside the main NavisWorks install directory:

colors.txt - these are a set of default Review™ colors (this file is used by NavisWorks).

PDMS_colors.txt - these are a set of the default PDMS™ colors (example file - this is not used by NavisWorks)

To use a different set of colors, copy the **colors.txt** file into one of the NavisWorks search directories, and edit the contents accordingly. The RVM Reader will search these directories on startup and use the first colors.txt file it finds. See "[Search Directories](#)" for more information

10. **Load RVS file** should be selected if a corresponding RVS file should be searched for and loaded on loading the RVM file. To work correctly, the RVS file must have the same name as the associated RVM file, but with the .rvs extension.
11. **RVS transparencies as materials** should be selected if it is required to respect transparencies coming through from the RVS files, treating them as materials within NavisWorks. If this is left unchecked, RVS transparencies are ignored.
12. Click **OK** to set these options or **Cancel** to exit the dialog without setting them.

IFC files

The NavisWorks IFC Reader reads in stand-alone .ifc files.

Supported Entities

- Faceted BReps
- Extruded area solids
- Geometric sets
- Face-based and surface-based models
- Simple, trimmed, and composite curves
- Simple surfaces
- Simple parametric, arbitrary and derived profiles
- Boolean clipping results and element-level voiding and projection CSG operations
- Basic styled and mapped items

- Property sets, including simple and complex properties

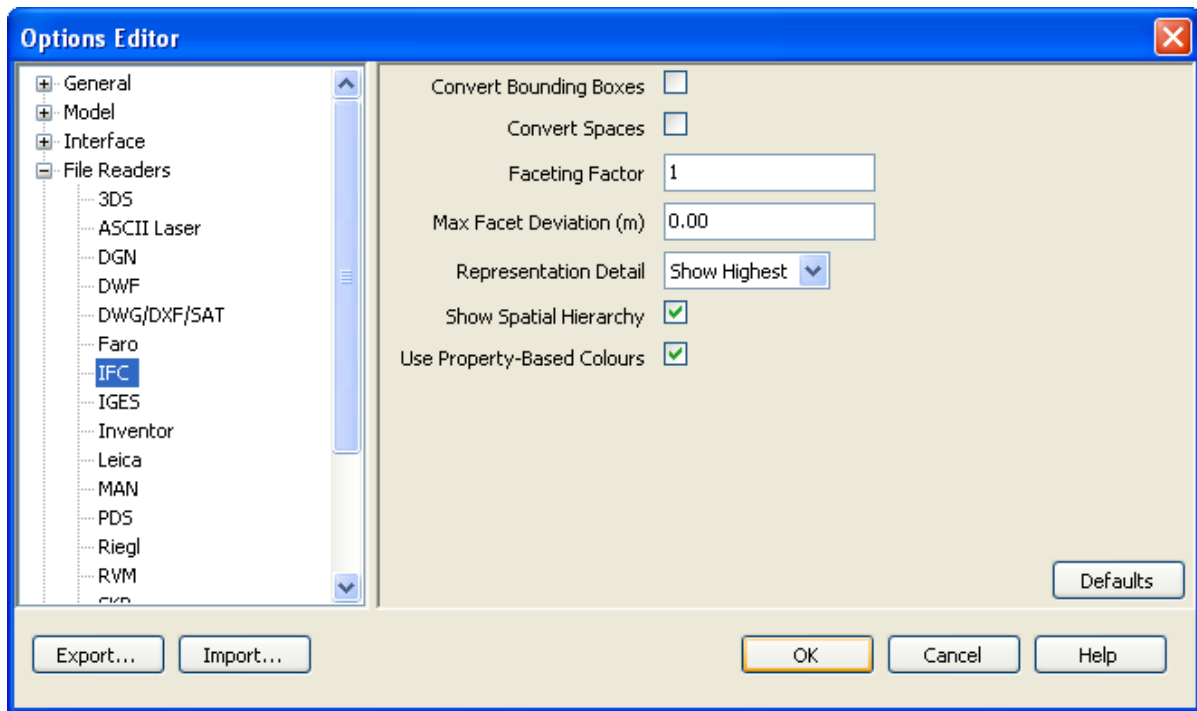
Unsupported Entities

- Voided BReps
- Bounded half-space solids
- Complex parametric profiles
- BSpline curves
- Curve styles
- Swept surfaces
- Textures and complex lighting
- Loading of server-based IFC models

IFC File Reader Options

Setting the IFC file reader options:

1. On the **Tools** menu, click **Global Options**.
2. Expand the **File Readers** node in the **Options Editor** dialog box, and click the **IFC** option.
The **IFC** page is displayed.



3. Enter the **Faceting Factor** (the value must be greater than 0). The higher the value, the more NavisWorks will facet rounded entities and therefore the smoother they will appear. See [Faceting Factor](#) for more information.
4. Enter the **Max Facet Deviation**. This will facet entities to within the specified tolerance. See [Max Facet Deviation](#) for more information.
5. Select the **Show Spatial Hierarchy** check box to have the Selection Tree window show the IFC model representation as a tree structure rather than a simple list of elements.
6. Select the **Convert Bounding Boxes** check box to bring through and visualise bounding boxes.
7. Select the **Convert Spaces** check box to bring through and visualise spaces.
8. Select the **Use Property-Based Colors** check box to convert and use property-based colors. If it is found that an ifc file is predominantly black when loaded, clear this box to revert back to using ifc-standard colors.
9. IFC elements can have multiple visual representations; bounding boxes (simplest), lines, styled lines, polygons, and styled polygons (most complex). Loading and showing all of these representations can lead to cluttered visuals and memory overheads. To manage this, **Representation Detail** can be set to **Highest Only** to only load and show the most complex level of detail available whilst ignoring simpler ones, **Show Highest** to load all representations, but only show the highest level of detail available, or **Show All** to show everything available.
10. Click **OK** to set these options or **Cancel** to exit the dialog without setting them.

Sketchup SKP files

NavisWorks supports Sketchup through its native SKP file format.

Supported Entities

- Geometry
- Materials (face front material only)
- Transparency
- Groups
- Components
- Layers
- Imported images
- Transparency

Unsupported Entities

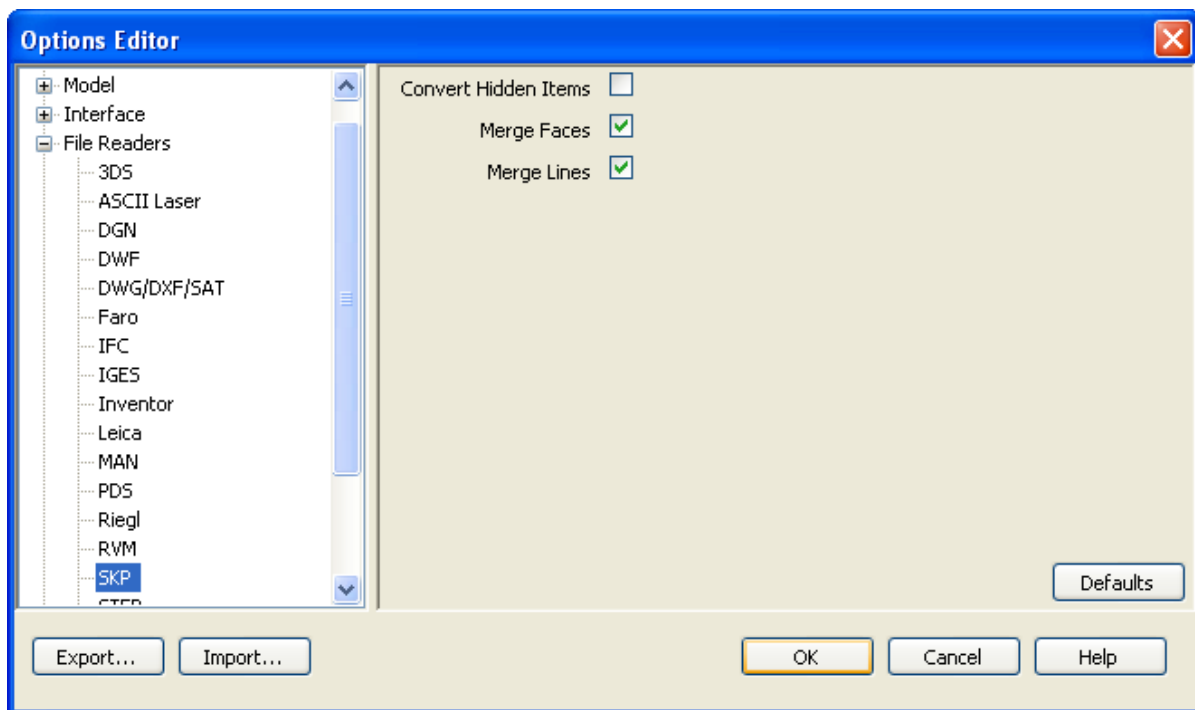
- Text
- Dimensions
- Section planes

Sketchup SKP File Reader Options

Setting the SKP file reader options:

1. On the **Tools** menu, click **Global Options**.
2. Expand the **File Readers** node in the **Options Editor** dialog box, and click the **SKP** option.

The **SKP** page is displayed.



3. Select the **Convert Hidden Items** check box if you want to read hidden entities from the .skp file. They will be converted but hidden in NavisWorks.
4. Select the **Merge Faces** check box if you want to reduce the complexity of the model as seen in the selection tree by interpreting a body as a single item consisting of a group of faces. Leaving unchecked leaves the faces as separate items in NavisWorks.
5. Select the **Merge Lines** check box if you want to reduce the complexity of the model as seen in the selection tree by interpreting adjoining lines with the same color, layer and parent as a single item. Leaving unchecked leaves these entities as separate items in NavisWorks.
6. Click **OK** to set these options or **Cancel** to exit the dialog without setting them.

File Exporters

Cache files can in some cases be exported from the CAD application itself. Currently, they can be written directly from AutoCAD, Revit, MicroStation, ArchiCAD and Viz. There are two reasons you may want to use cache files in this way:

1. Autodesk NavisWorks Review 2009 cannot read the native CAD file directly, in the case of ArchiCAD, Viz and Revit, but you wish to view the files created in these applications.
2. You wish to get a better quality file into NavisWorks. Although the direct file readers are adequate the majority of the time, the exporters can get a better quality. So if you are missing some items, or some items are being read wrongly by reading the native CAD files directly, then try exporting to an .nwc file and reading this into NavisWorks instead.

There are .nwc file exporters for the following CAD applications:

- Autodesk's AutoCAD
- Autodesk's Revit
- Bentley's MicroStation
- Autodesk's Viz and Max
- Graphisoft's ArchiCAD

AutoCAD .nwc Exporter

NavisWorks comes with ARX plugins for any AutoCAD™ based product, such as Architectural Desktop™, that enable you to export an .nwc file directly from the CAD application in which it was created. As long as AutoCAD is already installed on the computer when NavisWorks is installed, the ARX plugin is installed with NavisWorks on a **Custom Install** or **Full Install** and ready for use.

Note:

If you install AutoCAD after NavisWorks, then install NavisWorks again, choosing the **Custom Install** option and choose the relevant version of AutoCAD. The NavisWorks installer will find the right place for the plugin and set up all relevant registry entries for you.

The .nwc exporter is available for any AutoCAD based product between AutoCAD 14 and 2009 releases.

You can also publish .nwd files directly from AutoCAD™ if you have the Publisher tool. For more details, refer to "[Publishing from AutoCAD](#)".

Exporting .nwc files from AutoCAD:

1. Type **nwcout** at the command line.
2. The standard Windows™ **Save As** dialog box is displayed, so choose the location and name of the .nwc file to be exported.
3. Click **OK** to export the file or **Cancel** to return to AutoCAD without exporting it.

See "[DWG and DXF Files](#)" for what entities are and are not supported by the AutoCAD exporter.

If, on typing **nwcout** at the command line, you get an error, you probably have to load the ARX plugin manually. You should only have to do this once.

Loading the NavisWorks ARX Plugin

Loading the ARX plugin manually:

1. Type **ARX** (followed by return) at the command line.
2. Then type the letter **I** (followed by return) at the command line, for "Load".
3. The **Select ARX file** dialog box will be displayed, so browse to the ARX plugin. By default, for AutoCAD R14, this will be C:\Program Files\Common Files\Autodesk\NavisWorks\2009\nwexport.arx, for AutoCAD 2000 based applications, this will be C:\Program Files\Common Files\Autodesk\NavisWorks\2009\NWExport2000\nwexport2000.arx, for AutoCAD 2004 based applications, this will be C:\Program Files\Common Files\Autodesk\NavisWorks\2009\NWExport2004\nwexport2004.arx, and so on.
4. Click **OK** to load the ARX plugin.
5. You should now be able to use the **nwcout** command from AutoCAD to export an .nwc file.

The NavisWorks Partial Menu for AutoCAD

If you prefer to work from menus, there is a partial menu available to run this export command from, along with the other NavisWorks ARX plugins.

Loading the NWExport partial menu:

1. At the command line, type **menuload** (followed by return).
2. The **Menu Customization** dialog box will be displayed, so change the **Files of type** to **Menu Template (*.mnu)** and browse to the partial menu. By default, for AutoCAD R14, this will be C:\Program Files\Common Files\Autodesk\NavisWorks\2009\NWExport\LwNw_Export.mnu, for AutoCAD 2000 based applications, this will be C:\Program Files\Common Files\Autodesk\NavisWorks\2009\NWExport2000\LwNw_Export.mnu, and for AutoCAD 2004 based applications, this will be C:\Program Files\Common Files\Autodesk\NavisWorks\2009\NWExport2004\LwNw_Export.mnu, and so on.
3. Click **Load** and then **Yes** to the dialog box that appears.

You should now have a **NavisWorks** menu just before the **Help** menu and this will be reloaded into future AutoCAD sessions. This menu contains 4 items:

- Publish .nwd
See "[Publishing from AutoCAD](#)" for more details.
- Export .nwc
See "[AutoCAD .nwc Exporter](#)" for more details.
- NavisWorks Export Options
See "[AutoCAD .nwc Exporter Options](#)" for more details.

- Navigator

See “ [NavisWorks Navigator for AutoCAD](#) ” for more details.

AutoCAD .nwc Exporter Options

Available from the NavisWorks menu, or by typing **nwopt** at the command prompt, this enables you to configure various elements of the exported file to your choosing.

See “ [DWG and DXF File Reader Options](#) ” for details on what each of the options does.

Once you have set the options, future exports of .nwc and publishes of .nwd files will use these settings.

Revit .nwc Exporter

Autodesk NavisWorks Review 2009 cannot read native Revit files directly, however, support for both Revit Building and Revit Structures can be achieved through exporting a NavisWorks .nwc cache file, which can then be read into NavisWorks.

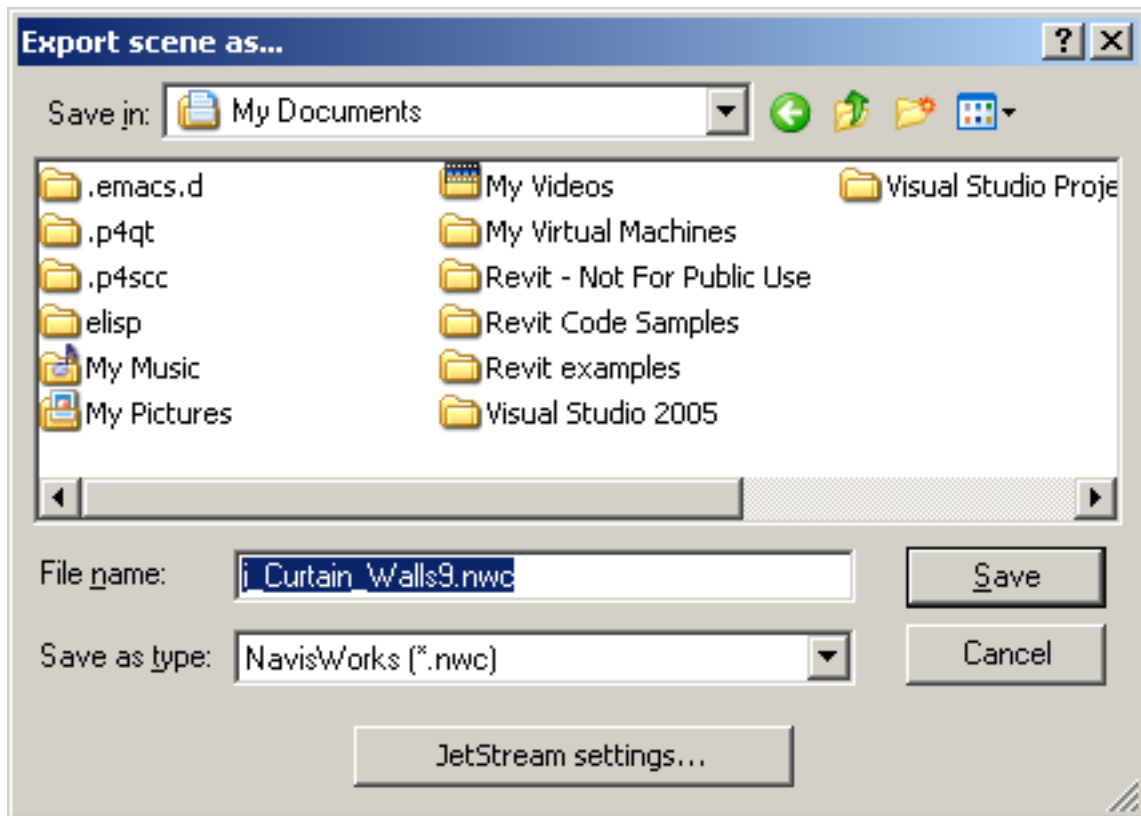
Note:

Earlier versions of Revit (Building 8 / Structures 2) require the .NET Framework version 1.1 to be separately installed. If the .Net Framework version 1.1 is not installed an error message will be displayed when Revit is started. You can download a copy of the .Net Framework version 1.1 by searching for ".Net Framework version 1.1 redistributable package" in the downloads section of [Microsoft's website](#).

Exporting .nwc files from Revit:

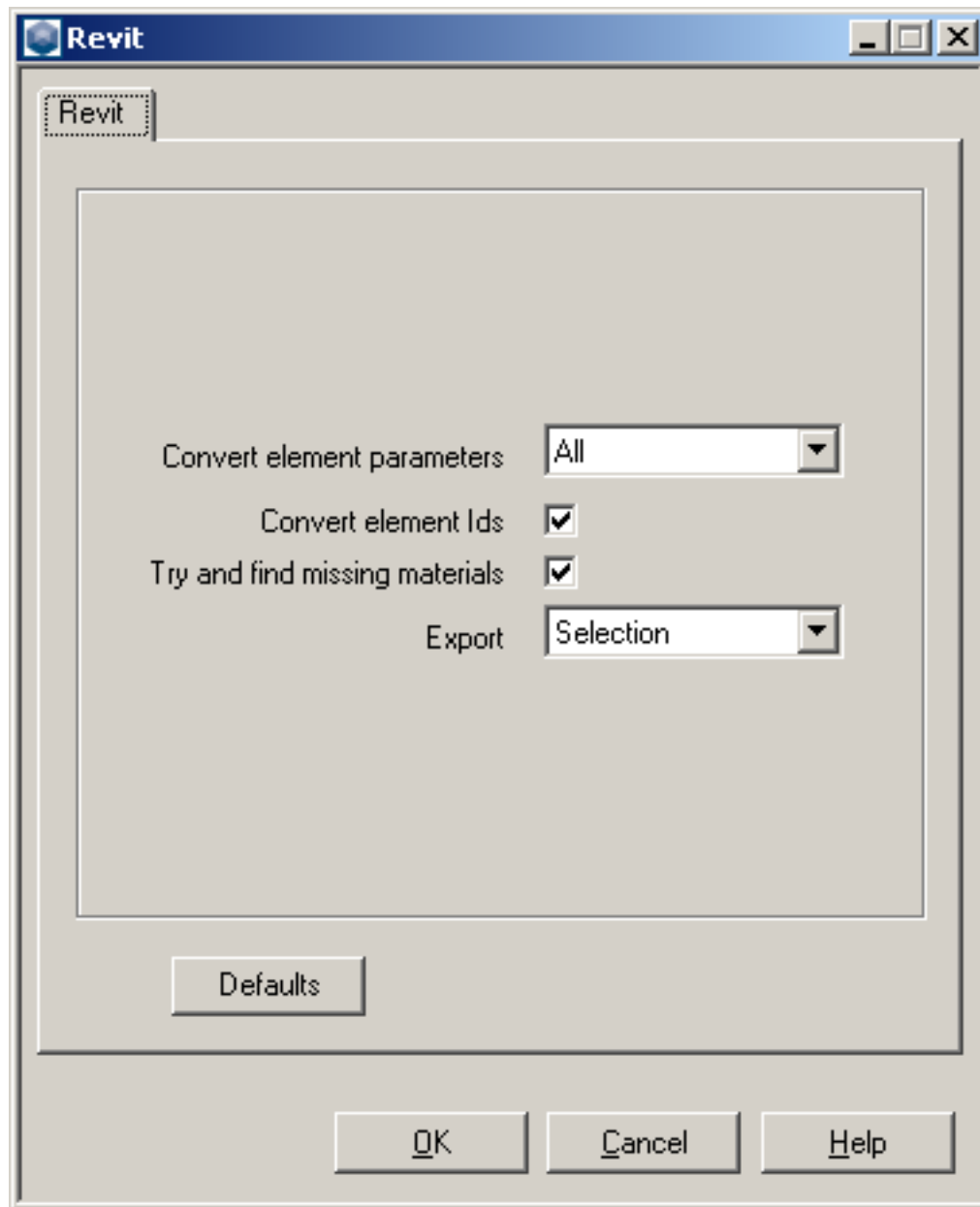
1. Start Revit and load the project.
2. Set the editing view to normal, and make sure the **Modify** tool is selected.
3. Select the **Tools > External Tools > Autodesk NavisWorks Review 2009** menu option. If this option is not available, check firstly that the **Modify** tool is selected, and secondly that the Revit license is correct such that the product is not being used in Demo/Viewer mode.

A file selection dialog box is displayed.



4. Select the location and filename you want to export to.
5. Click on the **NavisWorks settings** button to change the export configuration.

The **Revit Options** dialog is displayed



6. **Convert element parameters** can be set to **None** where none of the parameters are read, **Elements** where all parameter fields are read from all found elements, or **All** where all parameters from all found elements are read, as well as property tabs added for any elements referenced.
7. Select the **Convert element Ids** check box to export the id numbers on each Revit element.
8. Select the **Try and find missing materials** check box to search for an appropriate material where one is expected but not found. This can help to improve the appearance of exported models.
9. **Export** can be set to **Entire scene** where all geometry in the project is exported, **Current view** where everything that is currently visible is exported, or **Selection** where only those items that are currently selected are exported.

10. Click **OK** to export the file or **Cancel** to return to Revit without exporting it.

MicroStation .nwc Exporter

NavisWorks comes with MDL plugins for MicroStation™ 95, SE, /J and v8 that enable you to export .nwc files directly from the CAD application in which it was created. As long as MicroStation is already installed on the computer when NavisWorks is installed, the MDL plugin is installed with NavisWorks on a **Custom Install** or **Full Install** and ready for use.

Note:

If you install MicroStation after NavisWorks, then install NavisWorks again, choosing the **Custom Install** option and choose the relevant version of MicroStation. The NavisWorks installer will find the right place for the plugin and set up all relevant registry entries for you.

You can also publish .nwd files directly from MicroStation™ if you have the Publisher tool. For more details, refer to “ [Publishing from MicroStation](#) ”.

There are two steps to exporting .nwc files from MicroStation - first you have to load the MDL plugin into MicroStation and then you have to export the file.

Loading the NavisWorks MDL Plugin

Loading the NWExport MDL plugin manually:

1. Go to the **Utilities > Key-in** dialog box to load the application manually.
2. Type "**mdl load nwexport6**" (without the quotes) and press return.

If you regularly export .nwc files from MicroStation, then you will not want to load the NWExport plugin manually each time, so do the following:

Loading the NWExport MDL plugin automatically:

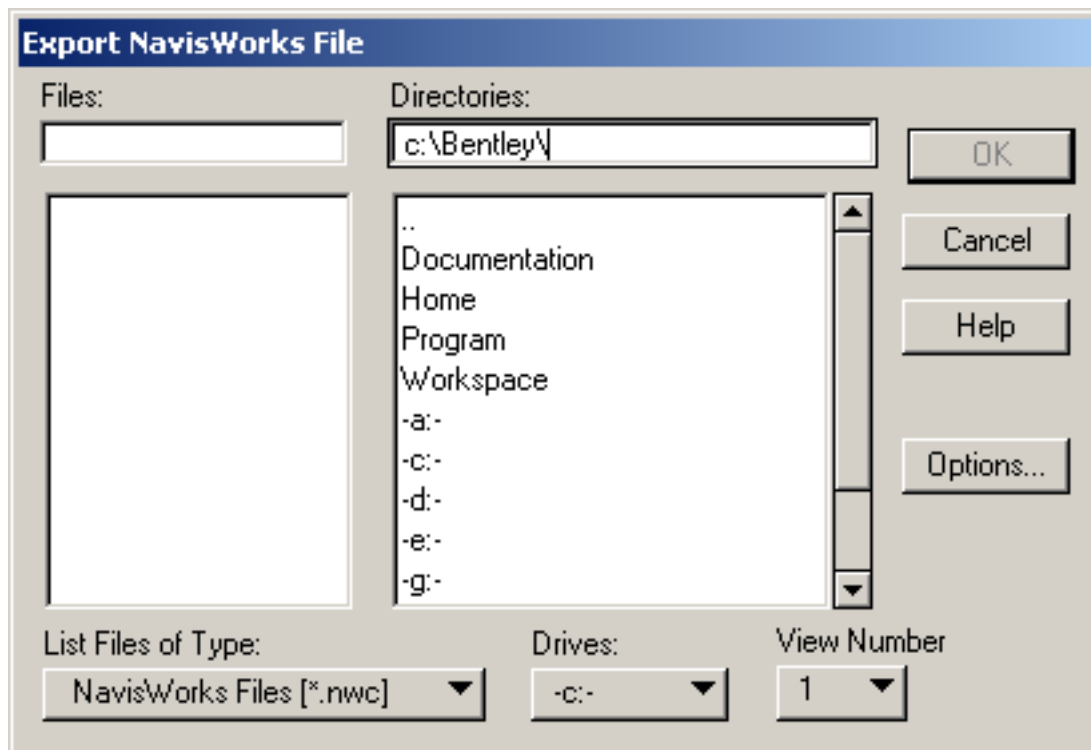
1. Go to **Workspace > Configuration**.
2. Choose **Design Applications** under **Category**.
3. Choose **NWEXPORT6** under **Available Applications**.
4. Click **Add** and confirm that you want NWExport added to your default configuration.
5. MicroStation will then automatically load NWExport in future sessions.
6. Click **OK**.

Once NWExport plugin is loaded, you can export to .nwc using the **nwcout** command from the key-in command line.

Exporting .nwc files from MicroStation:

1. Type **nwcout** at the key-in prompt.

The MicroStation export dialog box is displayed.



2. Select the location and filename you want to export to. The exporter will make a guess at a suitable filename for you.
3. Select the view number you wish to the model to be exported from.
4. Click the **Options** button if you want to change the export configuration. See "[MicroStation .nwc Exporter Options](#)" for more information on these options.
5. Click **OK** to export the file or **Cancel** to return to MicroStation without exporting it.

Note:

MicroStation can also be customized to add NWExport commands to the menu bar using the **Workspace > Customize** dialog box.

See "[DGN and PRP Files](#)" for what entities are and are not supported by the MicroStation exporter.

NavisWorks colors are derived from either MicroStation cell colors or MicroStation materials, depending on the export options set during **nwcout**. The appearance of objects in Publisher will match the appearance of a MicroStation shaded render.

The view number chosen for export determines the initial view in NavisWorks, whether level symbology is used and which levels are hidden.

Note:

The exporter only exports from 3D dgn files - 2D files are not supported.

Quickly exporting files

If you want to export the current design file quickly, you can use the **batchnwcout** key-in. This will not display the export dialog box, and it will not prompt you to overwrite any existing files. It simply replaces the design file extension (usually .dgn) with .nwc when exporting.

Exporting from the command line

The MicroStation exporter can also be run from the command line. This is useful when you want to export lots of files using an automated script.

It uses the **msbatch.bat** batch file that comes with MicroStation. To export a file from the command line, you must first ensure that the MicroStation program directory is in your `PATH` environment variable.

The format of the command line exporter is:

msbatch nwexport6 [-f] FILE [OUTPUT]

FILE is the name of the DGN file you want to export. This is the only required option. If you want, you can specify the name of the output file with the **OUTPUT** argument.

The command line exporter will only convert a file if it has changed since the last time you exported it. This is useful for speeding up exporting of a large number of files. If you want to force the exporter to re-export a file, use the **-f** option.

If the exporter encounters any problems, it will produce an error log in a file called `nwdout.err`.

MicroStation .nwc Exporter Options

Available from the NWExport dialog box, this enables you to configure various elements of the exported file to your choosing.

See “[DGN File Reader Options](#)” for details on what each of the options does.

Once you have set the options, future exports of .nwc and publishes of .nwd files will use these settings.

Viz and Max .nwc Exporter

While NavisWorks cannot directly read .max files, there is a plugin for Viz versions from 3 to 2008 and Max versions from 5 to 2009 that will export the model to an .nwc cache file that can then be read into NavisWorks. Viz will be outlined here, although the process is exactly the same for Max.

As long as Viz is already installed on the computer when NavisWorks is installed, the plugin is installed with NavisWorks on a **Custom Install** or **Full Install** and ready for use.

Note:

If you install Viz after NavisWorks, then install NavisWorks again, choosing the **Custom Install** option and choose the relevant version of Viz. The NavisWorks installer will find the right place for the plugin and set up all relevant registry entries for you.

See “[3DS Files](#)” for information on the supported and unsupported entities for the Viz exporter.

Exporting .nwc files from Viz and Max:

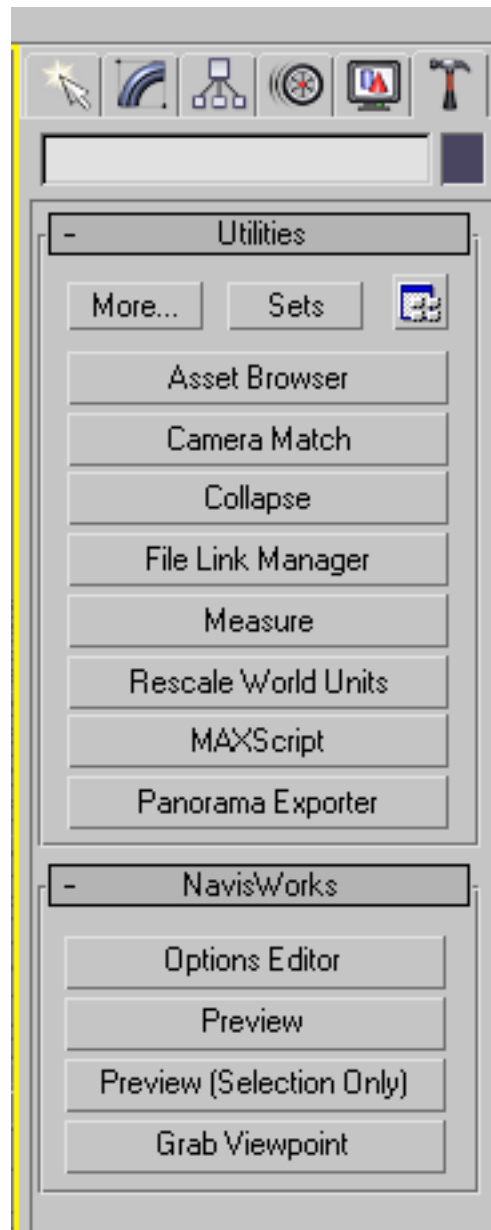
1. Go to **File > Export**.
The **Export** dialog box is displayed.
2. Set the **File Type** to "NavisWorks File (*.nwc)" and choose the location and name of the .nwc file to be exported.
3. Click **OK** to export the file or **Cancel** to return to Viz without exporting it.

Viz and Max .nwc Exporter Options

You have some control over the items that are exported from Viz to NavisWorks.

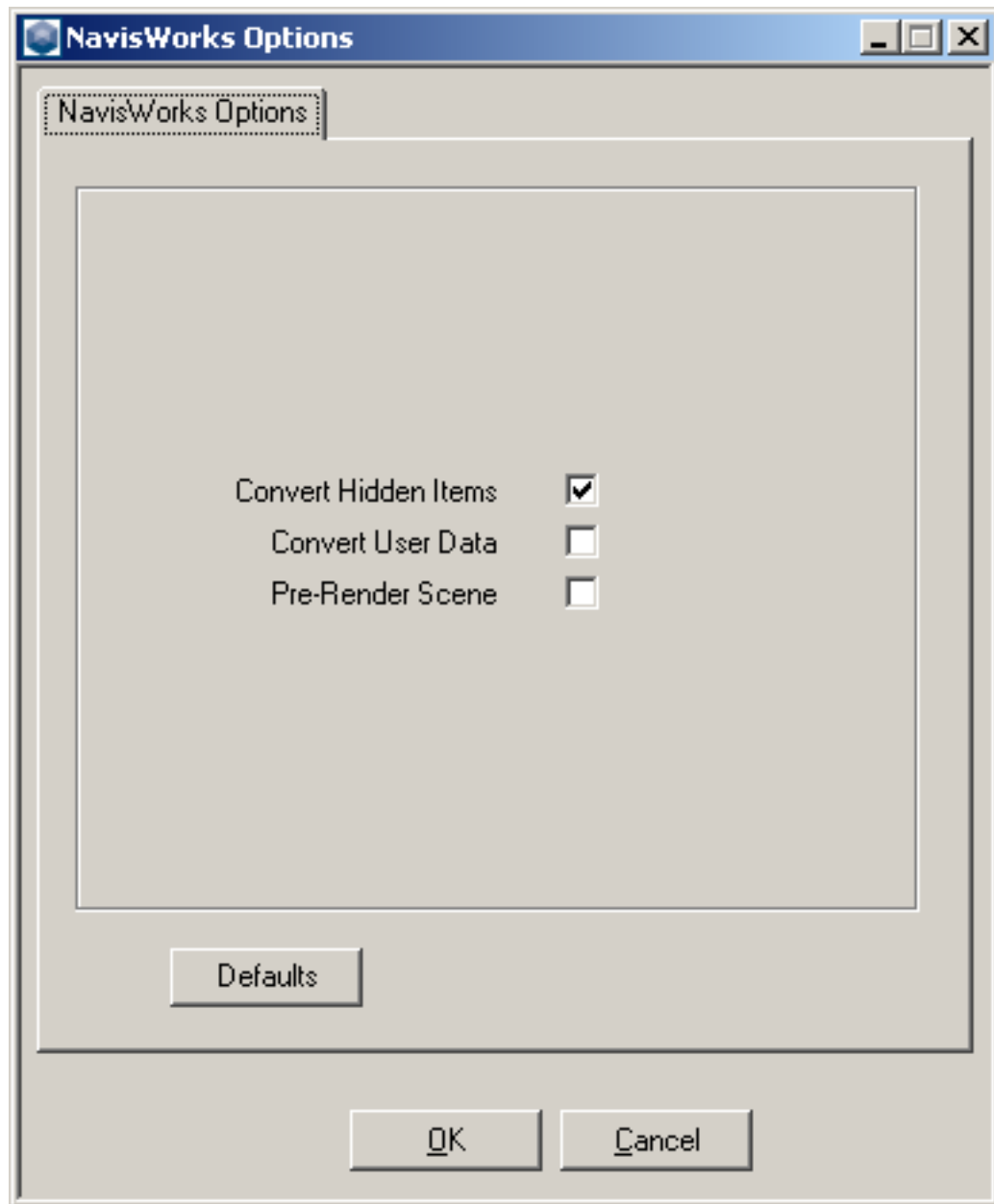
Setting the Viz and Max exporter options:

1. Go to the **Utilities** tab and click the **More** button.
2. Select **NavisWorks** from the list and click **OK**.
3. The NavisWorks command panel containing four buttons will open.



4. Click the **Options Editor** button.

The **NavisWorks Options** dialog box is displayed.



5. Select the **Convert Hidden Items** check box if you want to export hidden entities from the Viz scene. They will be exported but hidden in NavisWorks.
6. Select the **Convert User Properties** check box if you want to attach any user properties you have defined in Viz to the converted NavisWorks items.
7. Select the **Pre-Render Scene** check box if you want to ensure that all texture maps are exported with the model. In some rare cases, they can be missed, so if you experience this, try checking this box. It will force Viz to do an internal render and so cache all texture maps.

ArchiCAD .nwc Exporter

While NavisWorks cannot directly read ArchiCAD files, there is an add-on for ArchiCAD v6.5 through to v11.0 that will export the model to an .nwc cache file that can then be read into NavisWorks. The export add-on for ArchiCAD is available from both the 2D and 3D windows. All standard ArchiCAD elements and library parts can be exported as long as they have a 3D representation, and any others will be ignored. The exporter will save both standard materials and custom GDL script materials.

When saving from the 2D window the current story will be exported by default. An option may be set so that the whole model will be exported. A default view will be determined from the bounding box of the model.

When saving from the 3D window the view will become the default NavisWorks view (including window settings such as cutaway planes).

Note:

Only visible layers will be exported.

Cutaway plane settings does not set the NavisWorks section plane, but exports items that are physically reduced by the plane. It is advised to turn off the Enable library part instancing option since all instances will show the same sectioning as the original item (usually the first library part in the file), and this may lead to unexpected effects.

Exporting an .nwc file from ArchiCAD:

1. With a model loaded choose **File > Save As**. An options dialog box will allow you to change settings before the export process begins.
2. Select "NavisWorks (*.nwc)" as the file type and type in a file name.
3. Click **OK** to advance to the options dialog box.
4. Click **OK** in the options dialog box to export the file or click **Cancel** to return to ArchiCAD without saving anything.

Supported Entities

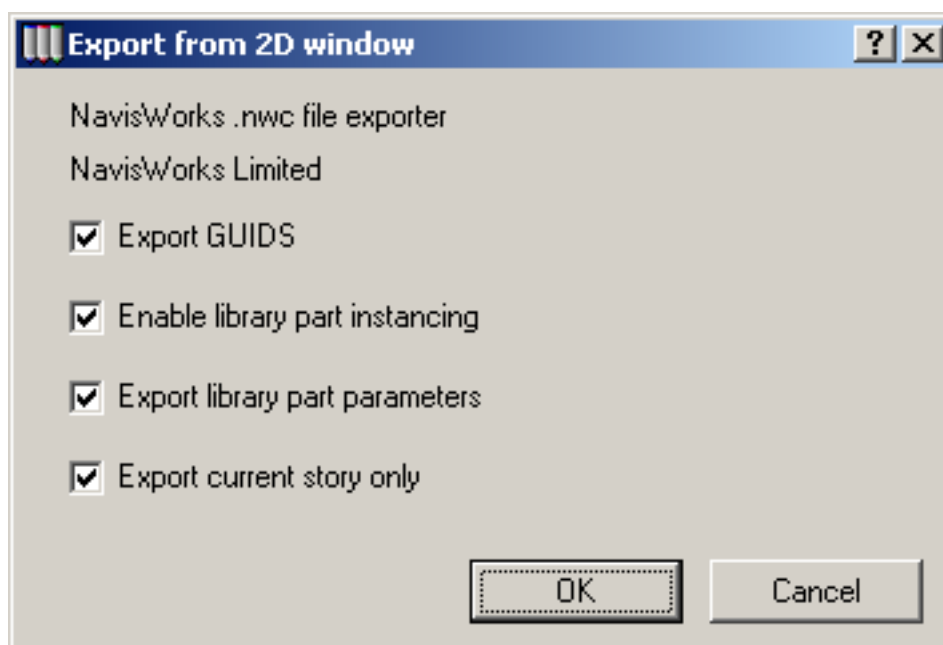
- Global Unique Identifiers (GUIDs)
- Custom parameters for library parts defined by GDL scripts
- Storeys.
- Library part instances
- Cameras
- Hotlinks
- Sun attributes

Unsupported entities

- Section planes
- Points
- Lines
- Textures

ArchiCAD .nwc Exporter Options

The export options appear after choosing **OK** from the **File > Save As** menu.



Setting the ArchiCAD exporter options:

1. Select the **Export GUIDs** check box if you want to attach a Globally Unique Identifier as a property to each item in the model. This is mainly useful for clash detection to track clashes.
2. Select the **Enable library part instancing** check box if you want to make instances of library parts rather than creating new items. This is only possible when multiple library part elements within the ArchiCAD model have exactly the same properties. Instancing these parts means a smaller .nwc file, and shorter export times.
3. Library parts defined in GDL scripts may have a number of user-defined custom parameters. Select the **Export library part parameters** check box if you want to save library part parameter values as item properties in NavisWorks.
4. Select the **Export current story only** check box if you want to only export the current story. Otherwise all stories will be exported. This is only applicable to exports from 2D views, as 3D views

will export everything contained within the view.

CAD Previewing

NavisWorks comes with plugins for AutoCAD 2000 and above for quick and simple previewing of the models that are being built in those applications. These previews help in setting up viewpoints within the CAD application, and also for previewing what the model will look like inside NavisWorks Freedom™ once published.

NavisWorks Navigator for AutoCAD

NavisWorks comes with an ARX plugin for products based on AutoCAD 2000™ and above that enables you to walk through your model in real time inside a dockable dialog in the AutoCAD interface. Not only that, but it enables you to easily import and export viewpoints between Navigator and AutoCAD so that you can quickly and easily get to where you want in the model.

Note:

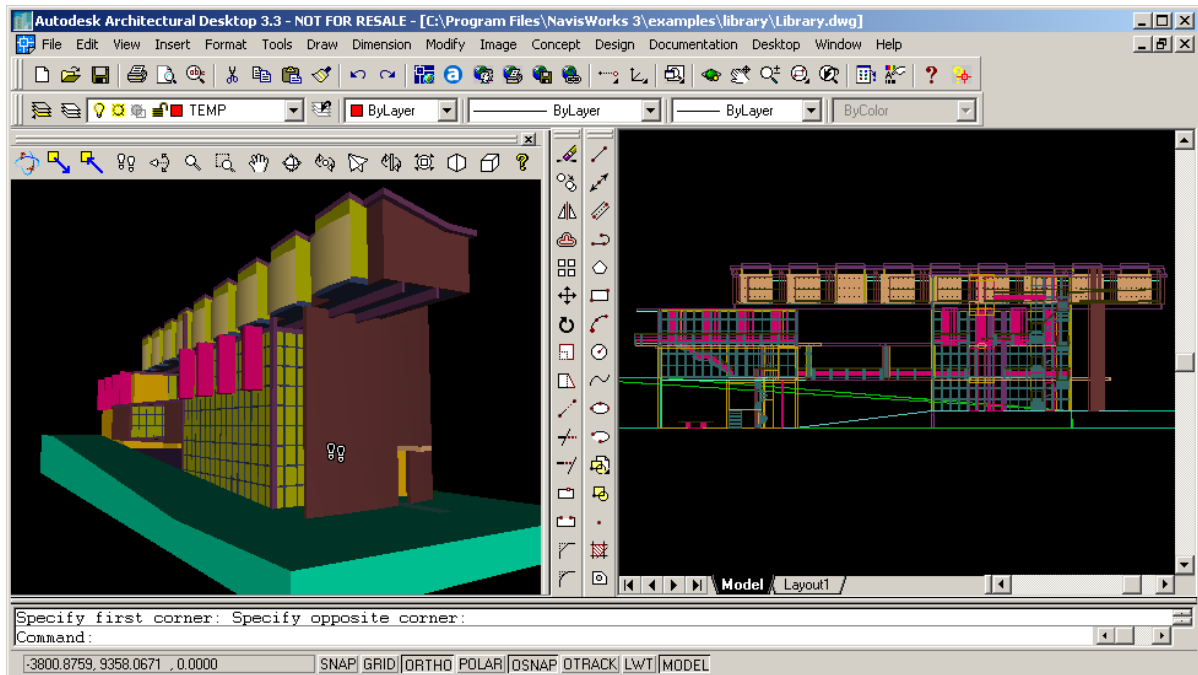
NavisWorks Navigator is not available for AutoCAD R14 or previous versions.


If you install AutoCAD after NavisWorks, then install NavisWorks again, choosing the **Custom Install** option and choose the relevant version of AutoCAD. The NavisWorks installer will find the right place for the plugin and set up all relevant registry entries for you.

Navigating AutoCAD models in real time:

1. Type **nwnavigator** at the command line, or go to **NavisWorks > Navigator**.



The Navigator dockable dialog box is displayed.



2. Navigator is very similar to NavisWorks Freedom™ (see "[Freedom](#) ", except that it has three extra buttons on the interface.
3. Click on the NavisWorks™ button  to update the Navigator window with what's in the AutoCAD window.

Note:

The Navigator window is not updated automatically when the AutoCAD model changes, so you have to click on this button manually every time you want to navigate around the latest model.

4. Click on the **Export Viewpoint** button  to update the current AutoCAD viewpoint with that in the Navigator window.
5. Click on the **Import Viewpoint** button  to update the Navigator viewpoint with that in the current AutoCAD window.

If, on typing **nwnavigator** at the command line, you get an error, you probably have to load the ARX plugin manually. See "[Loading the NavisWorks ARX Plugin](#) " for details on how to do this. You should only have to do this once.

If you prefer to work from menus, there is a partial menu available to run this command from, along with the other NavisWorks ARX plugins. See "[The NavisWorks Partial Menu for AutoCAD](#) " for more information on how to use this menu.

Chapter 11. Publishing

NavisWorks supports the creation of highly compressed NWD files, with options to embed object property information, and secure the files with password protection. The NWD file format can be viewed in the free NavisWorks viewer, NavisWorks Freedom, or opened in NavisWorks for full design review. You can publish files directly from NavisWorks or by exporting from AutoCAD™ or MicroStation™.

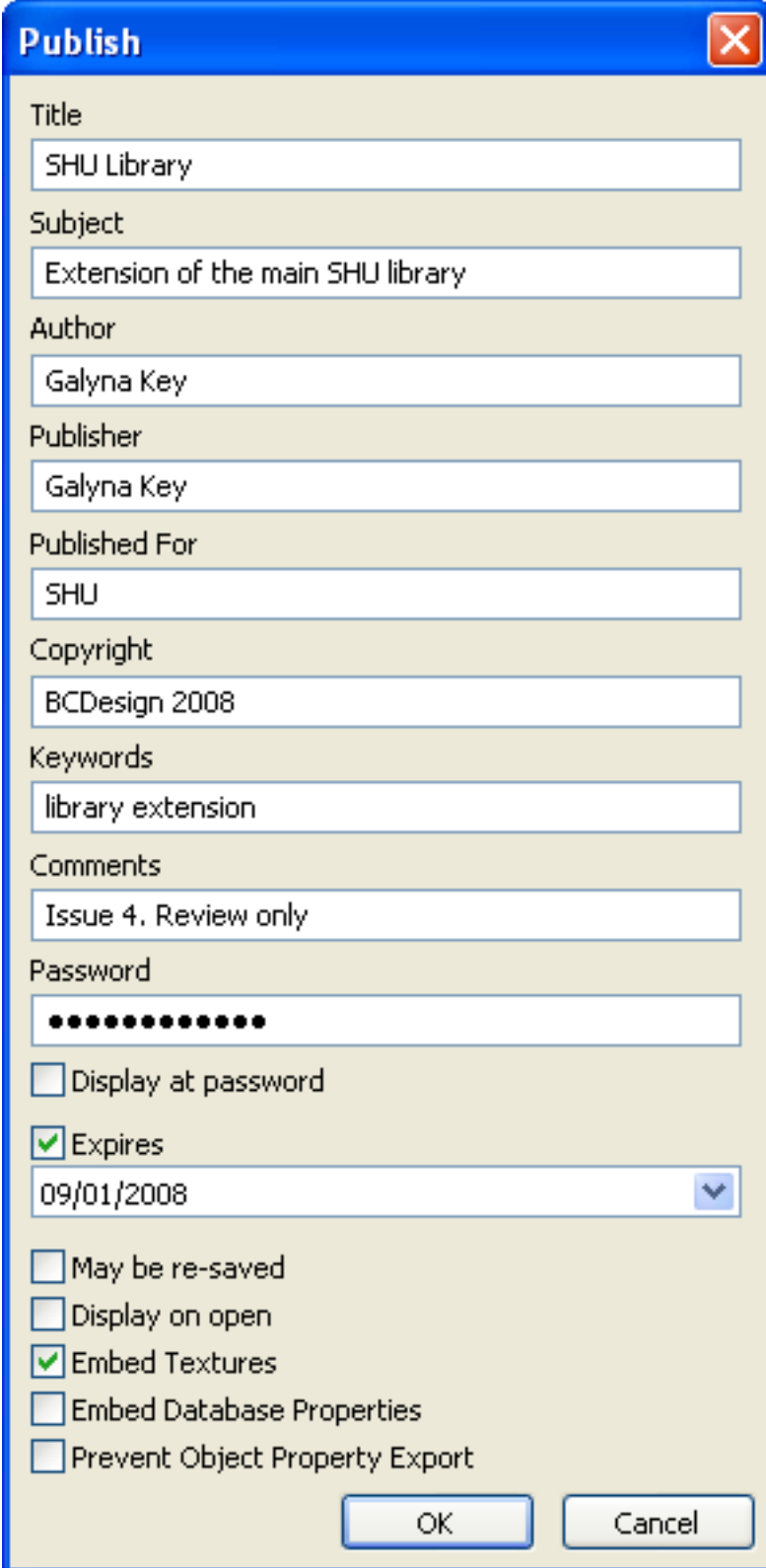
Publishing from NavisWorks

NavisWorks Publisher .nwd files are files published by NavisWorks Publisher and are snapshots of the model at a certain time.

Publishing a NavisWorks .nwd File:

1. On the **File** menu, click **Publish**.

The **Publish** dialog box is displayed

A screenshot of a 'Publish' dialog box with a blue title bar and a close button. It contains several text input fields and a list of checkboxes. The fields are filled with the following text: 'SHU Library', 'Extension of the main SHU library', 'Galyna Key', 'Galyna Key', 'SHU', 'BCDesign 2008', 'library extension', 'Issue 4. Review only', and a password of 12 dots. The checkboxes are: 'Display at password' (unchecked), 'Expires' (checked), '09/01/2008' (selected in a dropdown), 'May be re-saved' (unchecked), 'Display on open' (unchecked), 'Embed Textures' (checked), 'Embed Database Properties' (unchecked), and 'Prevent Object Property Export' (unchecked). At the bottom are 'OK' and 'Cancel' buttons.

Publish

Title
SHU Library

Subject
Extension of the main SHU library

Author
Galyna Key

Publisher
Galyna Key

Published For
SHU

Copyright
BCDesign 2008

Keywords
library extension

Comments
Issue 4. Review only

Password
●●●●●●●●●●●●

☐ Display at password

☒ Expires
09/01/2008

☐ May be re-saved

☐ Display on open

☒ Embed Textures

☐ Embed Database Properties

☐ Prevent Object Property Export

OK Cancel

2. You can enter as much, or as little information as you wish. **Title, Subject, Author, Publisher,**

Published For, Copyright, Keywords and **Comments** are all optional boxes to be completed by you.

3. **Password** gives you the opportunity to password protect nwd files. On clicking **OK**, you will be asked to re-enter the password to ensure you have not mis-typed it.
4. If the **Display at password** check box is selected, this will force NavisWorks or NavisWorks Freedom to display the publication entries in a dialog on asking for the password so that the recipient is able to know whose password to enter.
5. If the **Expires** check box is selected, this will "time-bomb" the file so that it will not be openable in NavisWorks or NavisWorks Freedom™ after the date set.

Note:

Evaluation copies of NavisWorks can publish .nwd files, however these files will have a "time-bomb" set to the same expiry date as the evaluation software. To remove the expiry date from an .nwd file created by an evaluation copy, you must re-publish the file with a full NavisWorks license.

6. If the **May be re-saved** check box is selected, this will allow NavisWorks to re-publish the file with new publication information. If this check box is not selected, the publication information in the nwd file will never be changeable.
7. The check box **Display on open**, if selected, will force NavisWorks to display the publication entries in a dialog on opening the file.
8. If the **Embed Textures** check box is selected, all textures will be embedded in the published file; separate texture files will no longer be created.
9. The **Embed Database Properties** check box, if selected, force any properties accessed via an external database to be embedded in the NWD. No database links will be stored in the file from this point on.
10. The check box **Prevent Object Property Export**, if selected, will stop any native CAD package object properties from being exported into the published file.
11. Click **OK** to go to the **File Save** dialog box where you can type in the name and location of the published file, or **Cancel** to return to NavisWorks.

Note:

When publishing a scene, any RPCs included in that scene are not published to the Presenter_maps directory or embedded in the NWD file. The size of the files and the fact that most are licensed currently prohibits this.

Publishing from AutoCAD™

NavisWorks Publisher comes with ARX plugins for any AutoCAD™ based product, such as Architectural Desktop™, that enable you to publish an .nwd file directly from the CAD application in which it was created.

Note:

If you install AutoCAD after NavisWorks, then install NavisWorks again, choosing the **Custom Install** option and choose the relevant AutoCAD. The NavisWorks installer will find the right place for the plugin and set up all relevant registry entries for you.

The .nwd publisher is available for any AutoCAD based product between AutoCAD 14 and 2004 releases.

Publishing .nwd files from AutoCAD:

1. Type **nwdout** at the command line, or go to **NavisWorks > Publish .nwd**.
2. The standard Windows™ **Save As** dialog box is displayed, so choose the location and name of the .nwd file to be published.
3. Click **OK** to export the file or **Cancel** to return to AutoCAD without exporting it.

See “ [AutoCAD .nwc Exporter](#) ” for more information on publishing options, what to do if the menu is not already loaded or you get an error on typing **nwdout** at the command line.

Publishing from MicroStation™

NavisWorks Publisher comes with MDL plugins for MicroStation™ SE, 95, /J and v8 that enable you to publish .nwd files directly from the CAD application in which it was created. As long as MicroStation is already installed on the computer when NavisWorks is installed, this MDL plugin is installed with NavisWorks and ready for use.

Note:

If you install MicroStation after NavisWorks, then install NavisWorks again, choosing the **Custom Install** option and choose the relevant MicroStation. The NavisWorks installer will find the right place for the plugin and set up all relevant registry entries for you.

There are two steps to publishing .nwd files from MicroStation - first you have to load the MDL application into MicroStation and then you have to publish the file.

Loading the NWExport MDL plugin manually:

1. Go to the **Utilities > Key-in** dialog box to load the application manually.
2. Type "**mdl load nwexport**" (without the quotes) and press return.
3. An options dialog box can be opened from this export dialog box to configure the file output.

If you regularly publish .nwd files from MicroStation, then you will not want to load the NWExport plugin manually each time, so do the following.

Loading the NWExport MDL plugin automatically:

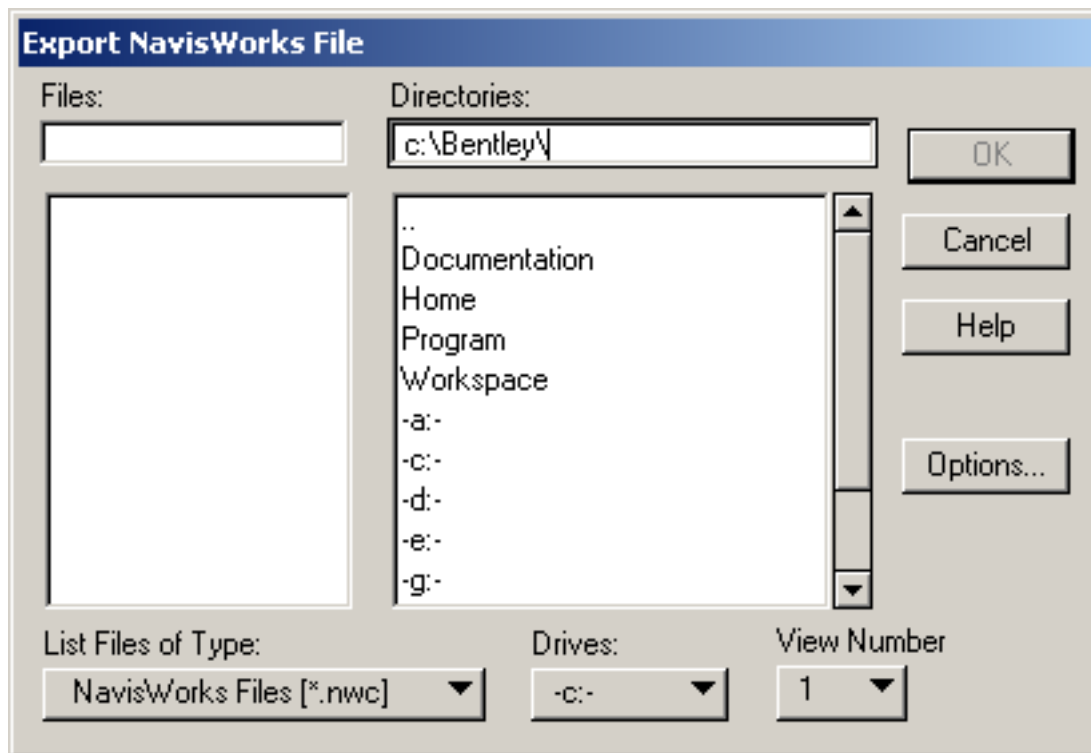
1. Go to **Workspace > Configuration**.
2. Choose **Design Applications** under **Category**.
3. Choose **NWExport** under **Available Applications**.
4. Click **Add** and confirm that you want NWExport added to your default configuration.
5. MicroStation will then automatically load NWExport in future sessions.
6. Click **OK**.

Once NWExport plugin is loaded, you can publish to .nwd using the **nwdout** command from the key-in command line.

Publishing .nwd files from MicroStation:

1. Type **nwdout** at the key-in prompt.

The MicroStation export dialog is displayed.



2. Enter the file name if it is to be different to the existing MicroStation file.

3. Enter the location you wish the file to be published to.
4. Select the view number you wish to the model to be published from.
5. Click the **Options** button if you want to change the export configuration. See “ [MicroStation .nwc Exporter Options](#) ” for more information on these options.
6. Click **OK** to publish the file or **Cancel** to return to MicroStation without publishing it.

Note:

MicroStation can also be customized to add NWExport commands to the menu bar using the **Workspace > Customize** dialog.

See “ [DGN and PRP Files](#) ” for what entities are and are not supported by the MicroStation exporter.

NavisWorks colors are derived from either MicroStation cell colors or MicroStation materials, depending on the export options set during **nwdout**. The appearance of objects in Publisher will match the appearance of a MicroStation shaded render.

The view number chosen for export determines the initial view in NavisWorks, whether level symbology is used and which levels are hidden.

Note:

The exporter only exports from 3D dgn files - 2D files are not supported.

Freedom

Freedom™ is a cut-down free version of NavisWorks. It is designed to work with NavisWorks Publisher by allowing you to distribute published .nwd files to your clients and other non-CAD users for free and easy viewing of your models. Simply publish the .nwd file, give them Freedom, and let them walk around your model.

Note:

Freedom supports all .nwd files from NavisWorks v3 onwards.

It is available as a stand-alone viewer, or as an ActiveX control for insertion into web pages. Once installed, Freedom looks like this:



The available functionality includes all of the navigation modes; the view all, perspective and orthographic modes; collision detection, gravity, auto crouch and third person modes; display of hyperlinks; and restoring viewpoints and animation playback.

The buttons on the Freedom interface work in the same way as the NavisWorks buttons:

- Open 

Simply opens the standard Windows™ **Open** dialog box for you to choose an .nwd file to open into Freedom.

- Walk 

Puts Freedom into **Walk** navigation mode.

- Look Around 

Puts Freedom into **Look Around** navigation mode.

- Zoom 

Puts Freedom into **Zoom** navigation mode.

-




Puts Freedom into **Zoom to Box** navigation mode.

- Pan 

Puts Freedom into **Pan** navigation mode.

- Orbit 


Puts Freedom into **Orbit** navigation mode.

- Examine 

Puts Freedom into **Examine** navigation mode.

- Fly 


Puts Freedom into **Fly** navigation mode.

- Turntable 


Puts Freedom into **Turntable** navigation mode.

- View All 


Zooms to extents so that the whole model is visible in the Freedom window.

- Perspective 


Puts the Freedom view into perspective viewing mode. This is mutually exclusive with orthographic mode.

- Orthographic 


Puts the Freedom view into orthographic viewing mode. This is mutually exclusive with perspective mode.

- Collision Detection 


Toggles collision detection on/off.

- Gravity 


Toggles gravity on/off.

- Auto Crouch 

Toggles automatic crouching on/off.

- Third Person 


Toggles the third person view on/off.

- Hyperlinks 

Toggles the display of hyperlinks on/off.

- Stop 


Stops the current animation playback.

- Pause 


Pauses the current animation playback.

- Play 

Plays the currently selected animation.

- Viewpoints 

This drop-down list shows all the viewpoints and animations that have been set up and published with the .nwd file. Click on one of the viewpoints from the drop-down list to recall that viewpoint into the Freedom window. Select an animation from the drop-down list and use the play, pause and stop buttons to control its playback.

- About 

Shows the **About** box, providing version details and offers a link to the NavisWorks web site.

Note:

Once installed, Freedom can be copied and run, without additional installation, on other machines running Windows 2000 or later. For this to work, the contents of the Freedom folder simply need to be copied to a new location, perhaps a CD or a network location, which other people can then have access to. An NWD file could be included to make it very simple to view the model. People would simply need to double-click on the Freedom executable and open the accompanying model file from that location.

Freedom is installed to:

```
C:\Program Files\Common Files\NavisWorks 6\DX\
```

The entire contents of this folder will need to be copied to the new location.

Chapter 12. Navigating

NavisWorks enables intuitive and interactive navigation around your 3D models at a guaranteed frame rate. The nine navigation modes give you complete flexibility to navigate around the model in real time. In addition to these navigation modes, there are selection and measuring tools that further facilitate the interrogation of model data.

The navigation tools allow you to do things such as focus on objects and change the view parameters. There are also options to look from predefined views, set the world up vector to a direction different than the one brought through from the CAD model.

The tilt bar enables you to tilt the model, or the camera (depending on if the navigation mode is camera-centric or model-centric) and has the same effect as spinning the wheel on a mouse. Two thumbnail views also give you a good overall view of the scene, allowing you to see whereabouts you are in the whole model and quickly jump from one end to the other.

Navigation Modes

There are nine navigation modes to control how you move around the main navigation view - six camera-centric modes and three model-centric modes. In a camera-centric mode, the camera moves within the scene, whereas in a model-centric mode, model moves inside the scene. For example, the **Orbit** and **Examine** modes essentially do the same thing, except that **Orbit** moves the *camera* around the focal point and **Examine** moves the *model* around the focal point. Movement in each mode is based on the cursor keys, the **Shift** and **Control** keys and mouse drags. The mouse wheel is also supported, allowing quick and easy zooming or tilting, depending on the current navigation mode.

Note:

Dragging with the left mouse button while holding down the **Control** key performs the same actions as dragging with the middle mouse button, which is useful if you only have a two-button mouse.

The **Shift** and **Control** keys modify the movement, for example holding down **Shift** in **Walk** mode speeds up movement, and holding down **Control** in this mode, glides the camera left/right and up/down.

Note:


Gliding the camera is opposite to panning the model. Gliding is a camera-centric motion and panning is a model-centric motion.

Right-clicking on any item in the main navigation view or selection tree displays a context menu that shows a list of commands relevant to a particular item.


Below is shown the **Navigation Mode** toolbar and the navigation modes available:



Walk 


Look Around 

Zoom 


Zoom Box 

Pan 

Orbit 

Examine 

Fly 

Turntable 

In addition to the **Navigation Mode** toolbar, you can use selection options on the **Selection Tools** toolbar. These options are mutually exclusive to navigation just as redlining and measuring are. See “[Select Mode](#)” for more information on the selection tools.


Walking

Walk mode enables you to walk through the model on a horizontal plane ensuring that "up" is always "up".

To walk through a model:

- On the **Viewpoint** menu, click **Navigation Mode > Walk**

or

- Click **Walk**  on the **Navigation Mode** toolbar.

Dragging the left mouse button, or using the cursor keys, spins the camera left and right and moves it forwards and backwards.

Holding down the **Shift** key speeds up this movement.

Holding down the **Control** key glides the camera left and right and up and down. As walk mode is camera-centric, this mode differs from the normal pan mode in that the camera is moved rather than the model.

Spinning the mouse wheel tilts the camera up and down.

Looking Around

Look around mode enables you to look around the model from the current camera position and gives the effect that you are moving your head around.

To look around a model:

- On the **Viewpoint** menu, click **Navigation Mode > Look Around**

or

- Click **Look Around**  on the **Navigation Mode** toolbar.

Dragging the left mouse button, or using the cursor keys, looks left, right, up or down.

Holding down the **Shift** key speeds up this movement.

Holding down the **Control** key rotates the camera around its viewing axis.


Zooming

Zoom mode enables you to zoom into and out of the model. Cursor up zooms in and cursor down zooms out.

To zoom:

- On the **Viewpoint** menu, click **Navigation Mode > Zoom**

or

- Click **Zoom**  on the **Navigation Mode** toolbar.

Dragging the left mouse button up and down, or using the up and down cursor keys, zooms in and out respectively.

Zooming to a Box

The zoom-to-a-box mode enables you to drag a box so that the contents of the box fill the view.

To use the zoom box:

- On the **Viewpoint** menu, click **Navigation Mode > Zoom Box**

or

- Click the **Zoom Box**  on the **Navigation Mode** toolbar.

Dragging a box with the left mouse button over the main navigation view fills the view with the contents of the box.

Holding down the **Shift** or **Control** keys, or spinning the mouse wheel, temporarily puts this mode into normal **Zoom** mode.


Panning

The pan mode enables you to pan the model rather than the camera.

To pan a model:

- On the **Viewpoint** menu, click **Navigation Mode > Pan**

or

- Click **Pan**  on the **Navigation Mode** toolbar.

Dragging the left mouse button pans the model up, down, left and right.

Holding down the **Shift** or **Control** keys, or spinning the mouse wheel, temporarily puts this mode into normal **Zoom** mode.


Orbiting

The orbit mode enables you to orbit the camera around the model, ensuring that "up" is always "up". The camera always orbits around the focal point of the model.

To orbit a model:

- On the **Viewpoint** menu, click **Navigation Mode > Orbit**

or

- Click **Orbit**  on the **Navigation Mode** toolbar.

Dragging the left mouse button, or using the cursor keys, rotates the camera around the model.

Holding down the **Shift** key or spinning the mouse wheel, temporarily puts this mode into normal **Zoom** mode.

Holding down the **Control** key glides the camera left and right and up and down. As orbit mode is camera-centric, this mode differs from the normal pan mode in that the camera is moved rather than the model.


Examining

The examine mode enables you to rotate the model about.

To examine a model:

- On the **Viewpoint** menu, click **Navigation Mode > Examine**

or

- Click **Examine**  on the **Navigation Mode** toolbar.

Dragging the left mouse button, or using the cursor keys, rotates the model about.

Holding down the **Shift** key or spinning the mouse wheel, temporarily puts this mode into normal **Zoom** mode.

Holding down the **Control** key, temporarily puts this mode into normal **Pan** mode.

If the mouse is moving when you let go of the button, the model keeps spinning! Click on it to stop. Holding the **Shift** key allows you to zoom in and out.

Flying

The fly mode enables you to fly around the model like in a flight simulator.

To fly through a model:

- On the **Viewpoint** menu, click **Navigation Mode > Fly**

or

- Click **Fly**  on the **Navigation Mode** toolbar.

Holding down the left mouse button moves the camera forward. As in a flight simulator, the left mouse button banks left/right when dragged left or right and tilts up/down when dragged up or down.

The up and down cursor keys will zoom in and out respectively and the left and right cursor keys will spin the camera left and right respectively.

Holding down the **Shift** key speeds up this movement.

Holding down the **Control** key rotates the camera around its viewing axis, while still moving forward.


Spinning on a Turntable

The turntable mode enables you to spin the model around the up vector. This navigation mode behaves as though the model is sitting on a turntable, ensuring that "up" is always "up".

To use the turntable:

- On the **Viewpoint** menu, click **Navigation Mode > Turntable**

or

- Click **Turntable**  on the **Navigation Mode** toolbar.

Dragging the left mouse button left and right, or using the left and right cursor keys, spins the turntable left and right respectively.

Holding down the **Shift** key or spinning the mouse wheel, temporarily puts this mode into normal **Zoom** mode.

Holding down the **Control** key, temporarily puts this mode into normal **Pan** mode.

Spinning the mouse wheel, or using the up and down cursor keys, tilts the turntable up and down, like the tilt bar.


Navigation Tools


Navigational tools are a number of handy tools for altering, resetting or changing the type of the camera, and the viewpoint displayed. These tools can be accessed from the **Viewpoint > Navigation Tools** menu, or from the **Navigation Tools** toolbar:





Navigation Tools comprises the following functions:


View All 


View Selected 

Focus 

Hold 


Perspective Camera 


Orthographic Camera 


Collision Detection 


Gravity 


Crouch 


Third Person 

Align With X-Axis 

Align With Y-Axis 

Align With Z-Axis 

Straighten Camera 

Set World Up to Current View 

Note:

The **Straighten** and **Set Up** buttons are not on the toolbar by default, but can be added by customizing it (see "[Customizing Toolbars](#)").

Viewing Everything


This function dollies and pans the camera so that the entire model is in view, which is very useful if you get lost inside a model or lose it completely.

Sometimes on doing a **View All**, you seem to just get a blank view. This is usually because there are items that are very small in comparison to the main model located a long way away from the main model. In these cases, it is best to click on an item in the selection tree and do a **View Selected** to at least find your way back to the model before trying to figure out which items are "lost".

To view everything:

- On the **Viewpoint** menu, click **Navigation Tools > View All**.

or

- Click **View All**  on the **Navigation Tools** toolbar.

Viewing Selected Items

This function zooms the camera so that the selected item fills the main navigation view.

To view a selected item:

- On the **Viewpoint** menu, click **Navigation Tools > View Selected**

or

- Click **View Selected**  on the **Navigation Tools** toolbar.


Focusing

This function puts the main navigation view into focus mode until the next click. Left-click on an item and the view swivels so that the point clicked is in the center of the view. The point clicked becomes the focal point for **examine**, **orbit**, **turntable** navigation modes.

To focus the camera:

- On the **Viewpoint** menu, click **Navigation Tools > Focus**

or

- Click **Focus**  on the **Navigation Tools** toolbar

or

- Right-click on an item in the NavisWorks scene or Selection Tree, then choose **Focus on Item** from the shortcut menu.


Perspective Camera

Uses a perspective camera to view with.

To select a perspective camera:

- On the **Viewpoint** menu, click **Navigation Tools > Perspective Camera**

or

- Click **Perspective**  on the **Navigation Tools** toolbar.


Orthographic Camera

Uses an orthographic camera to view with.

To select an orthographic camera:

- On the **Viewpoint** menu, click **Navigation Tools > Orthographic Camera**

or

- Click **Orthographic**  on the **Navigation Tools** toolbar.

Note:

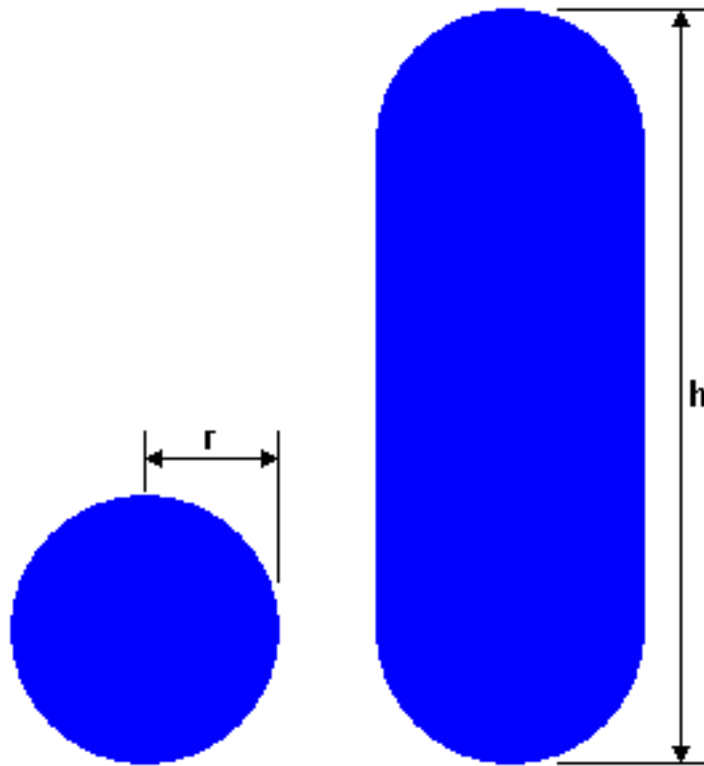
Orthographic cameras are not available with **Walk** and **Fly** navigation modes.

Collision Detection

This function defines you as a collision volume - a 3D object that can navigate around and interact with the model, obeying certain physical rules that confine you within the model itself. In other words, you have a mass and as such, cannot pass through other objects, points or lines in the scene.

You can walk over, or climb over objects in the scene that are up to half the height of the collision volume, thus allowing you to walk up stairs, for example.

The collision volume, in its basic form, is a sphere (with radius = r), that can be extruded to give it height (with height = $h \geq r$). See diagram below:



The dimensions of the collision volume are user-definable settings for the current view or as a global option. See “ [Editing Viewpoints](#) ” and “ [Viewpoints Options](#) ” for more information.

Collision detection is only available when in either the walk or fly navigation mode.

To activate collision detection:

- In **Walk** or **Fly** navigation mode, on the **Viewpoint** menu, click **Navigation Tools > Collision Detection**

or

- Click **Collision Detection**  on the **Navigation Tools** toolbar.

or

- Press **D** to toggle collision detection on/off.

Note:

When Collision Detection is turned on, rendering prioritization is changed so that objects around the camera or avatar are displayed with much higher detail than normal. The size of the region of high detail is based on collision volume radius and speed of movement (needing to see what is about to be walked into).

Gravity

This function only works in connection with collision detection.


Where collision detection gives you mass, gravity gives you weight. As such, you (as the collision volume) will be pulled downwards whilst walking through the model scene (gravity is only available when in the walk navigation mode).

This allows you to walk down stairs, for example, or follow terrain.

To activate gravity:

- In the **Walk** navigation mode, on the **Viewpoint** menu, click **Navigation Tools > Gravity**

or

- Click **Gravity**  on the **Navigation Tools** toolbar.

or

- Press **G** to toggle gravity on/off.

Crouching

This function only works in connection with collision detection.

When walking around the model with collision detection activated, you may encounter object that are too low to walk under, a low pipe for example. This function enables you to crouch under any such objects.


With crouching activated, you will automatically crouch under any objects that you cannot walk under at your specified height, thereby not impeding your navigation around the model.

If however, you are using collision detection to identify areas of the model that you cannot walk under, (again, using a low pipe for example) then there is also a temporary crouch function to allow navigation to proceed once the obstacle has been identified.

To activate crouching:

- In **Walk** or **Fly** navigation mode, on the **Viewpoint** menu, click **Navigation Tools > Crouch**

or

- Click **Crouch**  on the **Navigation Tools** toolbar.

or, if you only want to temporarily crouch

- Hold down the **Space bar** to turn crouching on. Releasing it will turn it off again.

Third Person View

This function allows you to view from a third person perspective.

When third person is activated, you will be able to see an **avatar** which is a representation of yourself within the 3D model. Whilst navigating you will be controlling the avatar's interaction with the current scene.


Using third person in connection with collision detection and gravity makes this a very powerful function, allowing you to visualize exactly how a person would interact with the intended design.

User definable settings are available for the current view and as global options, including avatar selection and dimensions and third person positioning. See “ [Editing Viewpoints](#) ” and “ [Viewpoints Options](#) ” for more information.

To view in third person:

- On the **Viewpoint** menu, click **Navigation Tools > Third Person**

or

- Click **Third Person**  on the **Navigation Tools** toolbar.

or

- Press **T** to toggle third person view on/off.

Note:

When Third Person mode is turned on, rendering prioritization is changed so that objects around the camera or avatar are displayed with much higher detail than normal. The size of the region of high detail is based on collision volume radius, speed of movement (needing to see what is about to be walked into) and the distance of the camera behind the avatar (in order to see what the avatar is interacting with).

Preset Viewpoints

The orthogonal viewpoints are preset inside NavisWorks and can be accessed from the **Navigation Tools** toolbar and the **Viewpoints** menu.


Aligning With The X-Axis

This function toggles between **Look From, Front** and **Look From, Back** views.

To align the viewpoint with the x-axis:

- On the **Viewpoint** menu, click **Navigation Tools > Align X**

or

- Click **Align X**  on the **Navigation Tools** toolbar.


Aligning With The Y-Axis

This function toggles between **Look From, Left** and **Look From, Right** views.

To align the viewpoint with the y-axis:

- On the **Viewpoint** menu, click **Navigation Tools > Align Y**

or

- Click **Align Y**  on the **Navigation Tools** toolbar.


Aligning With The Z-Axis

This function toggles between **Look From, Top** and **Look From, Bottom** views.

To align the viewpoint with the z-axis:

- On the **Viewpoint** menu, click **Navigation Tools > Align Z**

or

- Click **Align Z**  on the **Navigation Tools** toolbar.

Looking From a Preset Viewpoint

When this option is chosen the model is displayed from this viewpoint in the main navigation view. This is equivalent to toggling the **Align X**, **Align Y** and **Align Z** buttons on the **Navigation Tools** toolbar.

Looking from a preset viewpoint:

1. On the **Viewpoint** menu, click **Look From**.
2. Choose any direction from **Top**, **Bottom**, **Front**, **Left**, **Back** and **Right**.


Straighten

This function straightens the camera to align with the world up vector when it is already close to the world up vector.

To straighten the camera:

- On the **Viewpoint** menu, click **Navigation Tools > Straighten**

or

- Click **Straighten**  on the **Navigation Tools** toolbar.

Note:

This button is not on the toolbar by default, but can be added by customizing it (see “[Customizing Toolbars](#)”).


Set World Up

These functions set the world up vector to align with the selected orientation.

To set the world up vector to the current view:

- On the **Viewpoint** menu, click **Set World Up > Current View**.

or

- Click **Set Up**  on the **Navigation Tools** toolbar.

Alternatively, to set the world up vector to one of the orthogonal axes:

- On the **Viewpoint** menu, click **Set World Up** and choose one of the pre-defined axes (**+X Axis**, **-X Axis**, **+Y Axis**, **-Y Axis**, **+Z Axis**, or **-Z Axis**).

Note:

Navigation modes Walk, Turntable and Orbit all use the World Up vector, so navigation will occur at whatever angle is set using this function.

This button is not on the toolbar by default, but can be added by customizing it (see “[Customizing Toolbars](#)”).

Camera Tilt

The slider on this control bar provides direct control over the tilt angle of the camera, in degrees below (negative) or above (positive) the horizontal at the base of the tilt bar.

This is particularly useful in walk mode to look up and down. If your mouse has a wheel, this can be used to adjust the tilt angle.

To switch the Camera Tilt bar on and off:

- On the **View** menu, click **Control Bars > Camera Tilt**.

The **Camera Tilt** control bar is displayed



Thumbnail Views

Thumbnails are useful to get an overall view of where you are in the whole scene and to quickly move the camera to a location in a large model. There are two thumbnails available in NavisWorks so you can have one showing a section and another showing a plan view if you wish. The thumbnails show a fixed view of the model, with a triangular marker representing your current viewpoint. This marker moves as you navigate, showing the direction of your view. The marker may also be dragged by holding the left mouse button over it and dragging to move the camera in the main navigation view.

Note:

The marker changes to a small dot when the thumbnail view is in the same plane as the camera view.

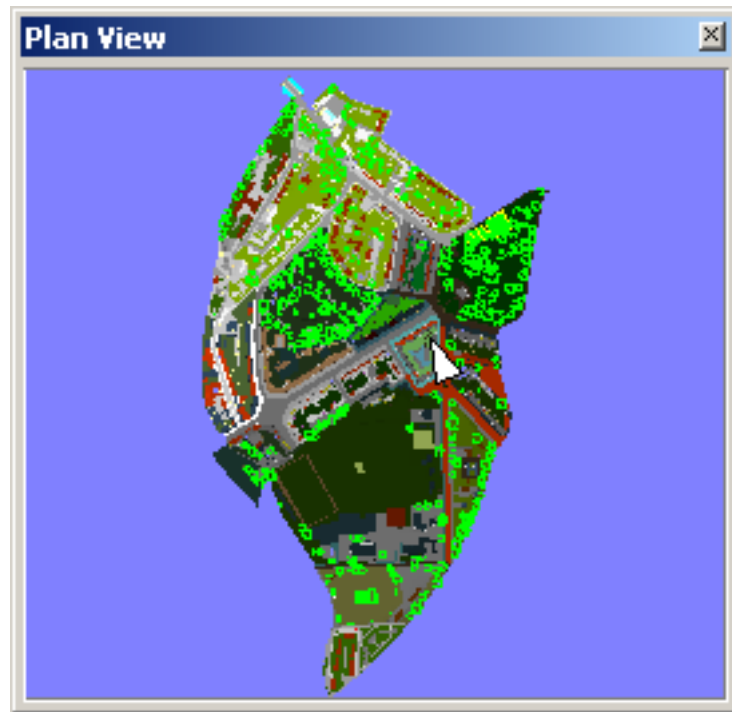
To turn on the plan thumbnail:

- On the **View** menu, click **Control Bars > Plan Thumbnail**.

or

- Click **Plan Thumbnail**  on the **Workspace** toolbar.

The **Plan View** thumbnail is displayed



To turn on the section thumbnail:

- On the **View** menu, click **Control Bars > Section Thumbnail**.

or

- Click **Section Thumbnail**  on the **Workspace** toolbar.

By default the **Section Thumbnail** shows the view from the front of the model and the **Plan Thumbnail** shows a plan view. The thumbnail view can be manipulated by right-clicking on the view. You can select from the following options: **Look From**, **Edit Viewpoint**, **Update Viewpoint**, **Lock Aspect Ratio** and **Refresh**.

Manipulating a thumbnail's view:

1. Right-click anywhere in the thumbnail to open the shortcut menu.
2. Use the **Look From** menu item and choose from **Top**, **Bottom**, **Front**, **Back**, **Left** or **Right** to set the thumbnail view to any of these pre-set viewpoints. You can also choose **Current Viewpoint** to set the thumbnail view to the active navigation viewpoint.
3. Choose **Update Current Viewpoint** to set the current active navigation viewpoint to be the same as that of the thumbnail.
4. Choose **Edit Viewpoint** if you want to set up the thumbnail's viewpoint by hand using the **Edit**

Viewpoint dialog box(see “ [Editing Viewpoints](#) ” for more information on this).

5. Choose **Lock Aspect Ratio** if you want the aspect ratio of the thumbnail to match that of the main navigation view and remain matching even when the thumbnail dialog box is resized. This will usually give gray strips either to the top and bottom, or to either side of the thumbnail view. See [Aspect Ratio](#) for more information on aspect ratio.
6. Choose **Refresh** to redraw the thumbnail based on the current setting. Thumbnail drawing uses software OpenGL and so can take a couple of seconds for large models.

Using a SpaceBall

Note:

The term **SpaceBall** is used as a generic term for all 3D motion controllers from 3Dconnexion™, including the SpaceBall, SpaceMouse and SpaceTraveler.

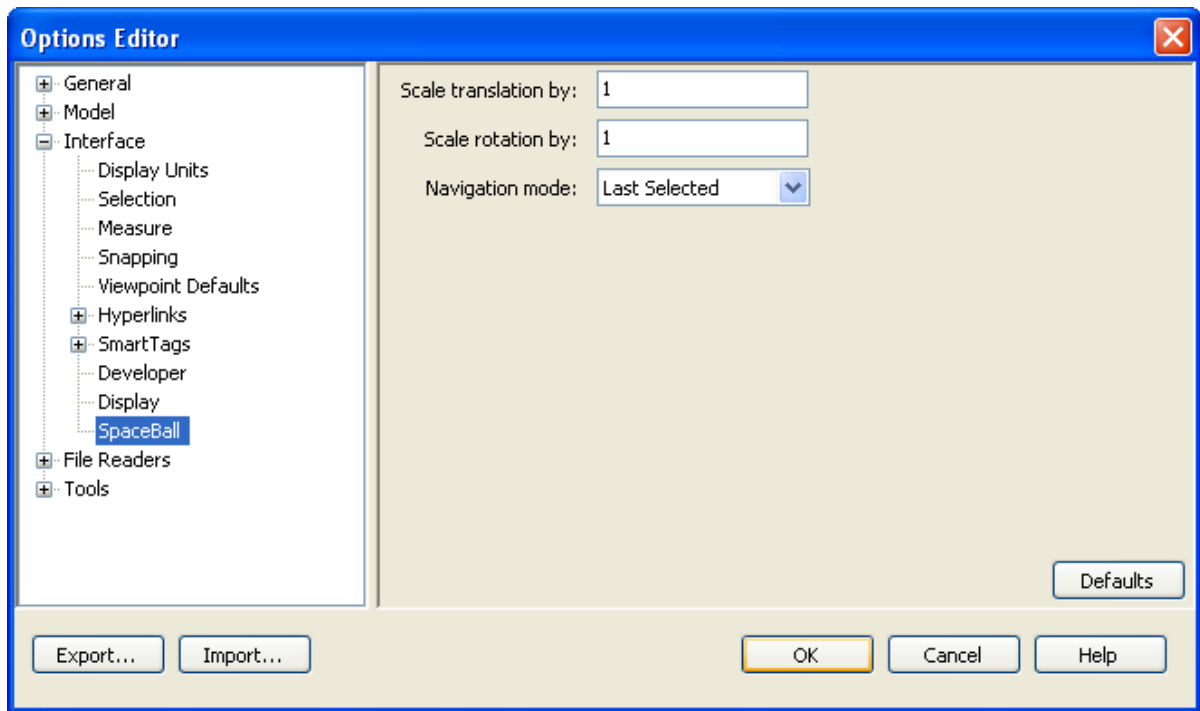
A **SpaceBall** can be used as an alternative to the mouse to move around the main navigation view. The behavior of the SpaceBall corresponds to the currently selected Navigation Mode. If no mode is selected on the **Navigation Mode** toolbar or if the selected mode is not a valid mode for the SpaceBall, then a default navigation mode will be used. This enables the user to navigate with the SpaceBall whilst performing other operations with the mouse. The default navigation mode can be set in the Options Editor dialog box.

The speed of navigation is sensitive to the amount of force applied to the SpaceBall. However, the user can also adjust the speed of translation and rotation by applying a factor to each of these in the **Options Editor** dialog box. These options are offered in addition to the adjustments that can be made using the Control Panel for the device which is supplied by the SpaceBall manufacturer with the installation.

Setting the SpaceBall behavior:

1. On the **Tools** menu, click **Global Options**.
2. Expand the **Interface** node in the **Options Editor** dialog box, and click the **SpaceBall** option.

The SpaceBall page is displayed.



3. Modify the **Scale translation** value if you want to increase or decrease the speed of translation.
4. Modify the **Scale rotation** value if you want to increase or decrease the speed of rotation.
5. Select the **Default navigation mode** from the drop-down list. This will be used when no valid navigation mode is currently selected.

Chapter 13. Selecting Items

With large models it is potentially a very time-consuming process to select items of interest. NavisWorks makes this a much simpler task by providing a range of functions for quickly selecting items both interactively and by searching the model manually and automatically. The main groups of functionality concerned with selecting items are:

- The selection tree
- Interactive selection
- Selection sets

Also connected with selecting items is finding items, which is covered in [Chapter 14, Finding](#).

In NavisWorks there is the concept of an active selection set (the currently selected items, or the current selection) and saved selections sets. Selecting and finding items makes them part of the current selection, so you can hide them or override their colors. At any time, the current selection can be saved and named for retrieval in later sessions.

Below is shown the **Selection Tools** toolbar and the selection modes available:



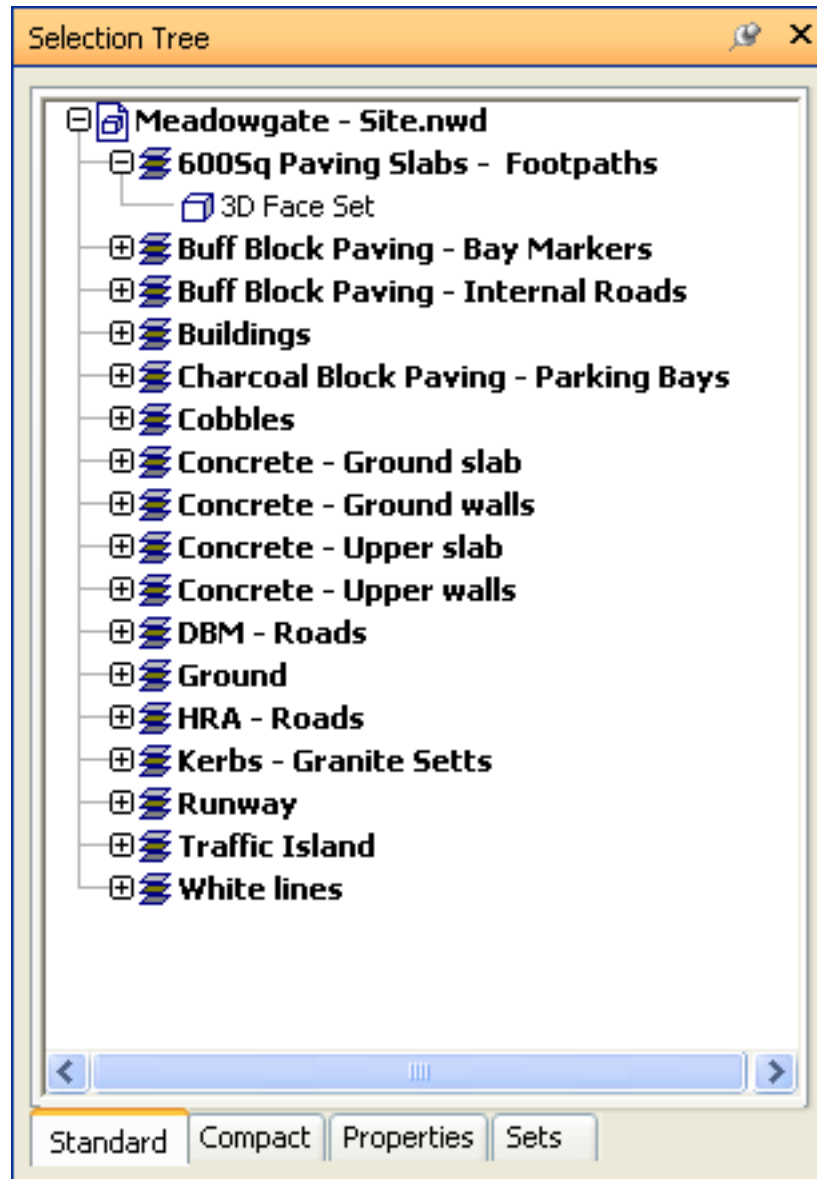
Select 

Select Box 

In addition to the selection modes, you can also use three editing options on the **Selection Tools** toolbar. See [Chapter 15, Editing](#) for more information on the editing tools.

Selection Trees

The selection tree is a tabbed control bar which displays a variety of hierarchical views of the structure of the model, as defined by the CAD application in which the model was created.



By default there are four tabs, called **Standard**, **Compact**, **Properties** and **Sets**:

- "Standard" displays the default tree hierarchy, including all instancing. The contents of this tab can be sorted alphabetically by right-clicking on any item in the tree and selecting **Scene > Sort**. It is not possible to undo this action.
- "Compact" displays a simplified version of the "Standard" hierarchy, omitting various items. You can control the level of complexity of this tree using the **Select** options (see ["Selection Options"](#) for more information).
- "Properties" displays the hierarchy based on the items' properties. This enables simple manual searching of the model by item property. See [Chapter 14, Finding](#) for a much more powerful way of searching the model for items with certain properties.
- "Sets" simply shows the same view as the selection sets control bar.

Naming of items reflects the names from the original CAD application, wherever possible.

There are several different tree icons representing the types of item that make up the structure of a model:



A model, such as a drawing file or design file.



A layer or level.



A group, such as a block definition from AutoCAD or cell definition from MicroStation.



An instanced group, such as an inserted block from AutoCAD or cell from MicroStation. If in the imported file the instance was unnamed, NavisWorks names the instance to match its child's name.



An item of geometry, such as a polygon.



An instanced item of geometry, such as an instance from 3D Studio.



A composite object. A single CAD object that is represented in NavisWorks by a group of geometry items.



A search. Behind the scenes, NavisWorks is searching the model for all items with a property of this type and sets up the find specification to repeat this search if the selection set is saved. See “[Selection and Search Sets](#)” for more information on this.

Each of these item types can be Hidden (gray), Unhidden (dark blue) or Required (red).

Note:

If a group is selected as Hidden or Required then all instances of that item will be hidden or required. If you wish to operate on a single occurrence of an item then you should make the instanced group (the level above, or the "parent", in the hierarchy) Hidden or Required.

You can use the selection tree in combination with the main navigation window to select items into the current selection, which is highlighted in both the selection tree and the main navigation window.

Note:

Using the **Shift** and **Control** keys while selecting items in a selection tree will do the standard Windows™ multiple selection: **Control** allows multiple selection item by item and **Shift** allows multiple selection between the first and last items selected.

If you have the Clash Detective tool, the selection trees will be used for selecting items for the clash tests.

The selection trees are also used inside the **Find Items** control bar for the ability to refine your searches better. See “[Finding Items](#)” for more information.

Note:

Additional customised selection tree tabs can be added by using the NavisWorks API.

Interactive Selection

NavisWorks provides several methods to interactively select items into the current selection. You can use the tabs in the selection tree, select items in the main navigation window with select and select box modes and you can select other items with similar properties to an existing selection using the selection commands.

Note:

Right-clicking on any item in the tree view or main view temporarily selects the item and displays a context menu. You can click on the topmost menu item to permanently select the item. Pressing **Esc** deselects everything.

Select Mode

As standard, this mode is mutually exclusive to the navigation modes so that when you are selecting, you cannot navigate and vice versa.

Note:

When using a SpaceBall in conjunction with the standard mouse control, the SpaceBall can be configured for navigation and the mouse for selecting. See “[Using a SpaceBall](#)” for more information.

Select mode allows you to click on an item in the main navigation window to select it. Once a single item is selected, its properties will be shown in the Properties control bar.


You can select multiple items in the main navigation window using the familiar Windows™ methods of holding down the **Control** key while selecting items. This will add them to the current selection. Alternatively, if the items are already in the current selection, holding down **Control** while selecting them again will remove them from the current selection.

Holding the **Shift** key whilst selecting items in the main navigation window will cycle through the selection resolution, allowing you to get more specific with your selections. See Selection Resolution for more information on this.

To select an item:

- On the **Edit** menu, click **Select > Select**

or

- Click **Select**  on the **Selection Tools** toolbar.

Select Box Mode

This mode, which can be used in conjunction with the normal select mode allows you to drag a box in the main navigation window to select multiple items at once. This mode is also mutually exclusive to the navigation modes so that when you are selecting, you cannot navigate and vice versa.


Dragging the box will select all items within the box. Holding down the **Shift** key while dragging the box will select all items within and that intersect the box.

You can select multiple items in the main navigation window using the familiar Windows™ methods of holding down the **Control** key while selecting items. This will add them to the current selection. Alternatively, if the items are already in the current selection, holding down **Control** while selecting them again will remove them from the current selection.

To select multiple items using a draggable box:

- On the **Edit** menu, click **Select > Select Box**

or

- Click **Select Box**  on the **Selection Tools** toolbar.

Selection Commands

Selection commands enable you to quickly alter the current selection using logic. You can select multiple items based on the currently selected items' properties, or quickly invert the set, select everything or nothing.

Selecting items with selection commands:

1. On the **Edit** menu, click **Select**.
2. Choose the required selection command.

Standard selections are:

- **Select All**

All items contained within the model are selected.

- **Select None**

Deselects everything in the model.

- **Invert Selection**

Every selected item becomes deselected and vice versa.

- **Selection Sets**

Provides you with options to save and recall sets. See “[Selection and Search Sets](#)”.

- **Select Multiple Instances**

Selecting an item then selecting **Multiple Instances** will select all instances (sometimes called insertions) of that geometry group that occur in the model.

- Select Same Name

Every item with the same name as the selected item will also be selected.

- Select Same Type

Every item of the same type as the selected item will also be selected.

- Select Same (property)

Every item with the same property as the selected item will also be selected. The property can be anything from **Material**, **Hyperlink** or any other searchable property attached to the item.

Note:

Selecting **Same** (property) works by comparing items' properties. If you have multiple items selected when you perform a selection command of same name or type etc., all the types, names and properties of the items in the current selection are compared with all items properties in the scene. Those matching any of the current items selected will be selected.

Selection and Search Sets

Selection sets are useful for saving a group of items that you might want to regularly perform some action on, such as hiding or changing transparency. They simply store a group of items for later retrieval. There is no intelligence behind this set - if the model changes at all, the same items will be selected (assuming they are still available in the model) when recalling the selection set.

Search sets work in a similar way, except that they save search criteria instead of the results of a selection, so that you can re-run the search at a later date as and when the model changes. See [Chapter 14, Finding](#) for information on searching the model for items.

Selection and search sets can be named and contain comments. They can also be highlighted with icons in the main navigation window, so that when you click on one, the selection set is restored to the active set and all the items within it are re-selected.

Saving Selection and Search Sets

Saving a selection set:

1. Select all the items you want saving.
2. On the **Edit** menu, click **Select > Selection Sets > Add Current Selection**.

or



Right-click on the **Selection Sets** control bar and click **Save Current Selection** on the shortcut menu.

Saving a search:

1. Set up a search as explained in “ [Finding Items](#) ”.
2. On the **Edit** menu, click **Select > Selection Sets > Add Current Search**.

or

Right-click on the **Selection Sets** control bar and click **Save Current Search** on the shortcut menu.

New selection sets and search sets are named "Selection SetX" where 'X' is the next available number added to the list. A selection set is identified by this icon:  and a search set by this icon: 

Note:

Saved selection and search sets can be renamed by slow clicking (clicking and pausing without moving the mouse) on the set, or clicking on it and pressing **F2**.

Recalling Selection and Search Sets

To re-select items from a selection set:

- On the **Edit** menu, click **Select > Selection Sets** and click the saved selection or search set from the list.

or


- In the **Selection Sets** control bar, simply click on the selection or search set from the list.

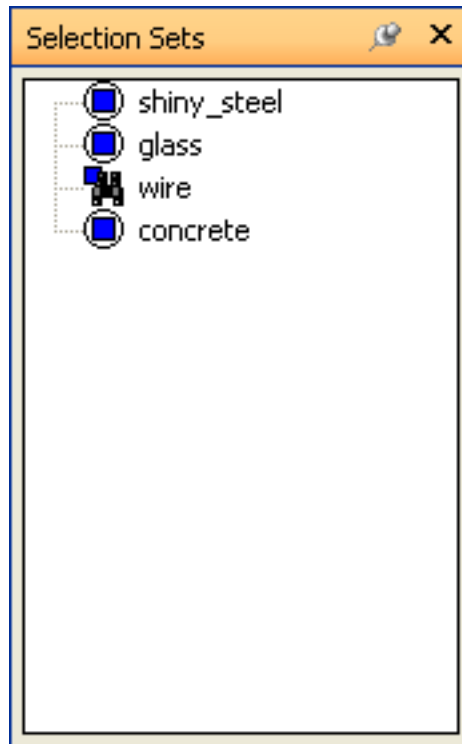
Note:

On recalling a selection set, all the items that were selected when the set was saved are re-selected into the current selection.

On recalling a search set, the search that was saved into the set is re-run and any items matching the specification are selected into the current selection.

Managing Selection Sets

As well as a tab on the selection tree, there is also a control bar dedicated to selection sets. To activate it, click on  in the **Workspace** toolbar or on the **View** menu, click **Control Bars > Selection Sets**:



This is the main management center for selection sets. All actions concerning selection sets are available by right-clicking this control bar.

Right-clicking a blank space in the **Selection Sets** control bar opens a shortcut menu with the options to **Save Current Selection** or **Save Current Search**, as outlined in "[Saving Selection and Search Sets](#)". This also gives access to the **Add Folder** and **Sort** options as detailed below.

Managing Selection Sets:

1. Right-click a selection set.
2. Click **Add Folder** to create a new folder above the selected item.
3. Click **Save Current Selection** to save the current selection as a selection set in the list. This set will contain the currently selected items.
4. Click **Save Current Search** to save the current search as a selection set in the list. This set will contain the current search criteria.
5. Click **Make Visible** to make visible the items contained within the selected selection set.
6. Click **Add Comment** to add a comment to the selection set. This command will display the **Add Comment** dialog box. See "[Commenting](#)" for more information on comments.
7. Click **Edit Comment** to edit a comment attached to the selected selection set. This command will display the **Edit Comment** dialog box. See "[Commenting](#)" for more information on comments.
8. Click **Add Copy** to create a copy of the selection set to the list. The copy will be named the same as the selection set clicked on, but with a "- copy" suffix.

9. Click **Update** to set the selected selection set to the currently selected items, or if it's a search set, it will update it with the current search.
10. Click **Delete** to delete the selected selection set.
11. Click **Rename** to rename the selected selection set.
12. Click **Sort** to sort the contents of the Selection Sets window alphabetically.

Using Folders to Manage Selection Sets:

Folders in the Selection Sets control bar work in a similar way to how they do in Microsoft Windows. They can be created by right-clicking either on a blank space in the **Selection Sets** control, or on any visible item in the list and selecting **Add Folder** from the shortcut menu. If the item selected is a folder, then the new folder will be created inside, otherwise it will be created in the root of the control above the selected item.

Items in the list can also be dragged and dropped into and out of folders, including folders themselves as well as their contents, simply by selecting the item, holding the left mouse button down, moving over to where the item should be placed, and letting go of the left mouse button. In this way it is possible to create a variety of nested folders containing any number of folders, selection and search sets.

Selection Resolution

Selection resolution affects what geometry you select when selecting items in the main navigation window using **Select mode**.

When you click on an item in **Select** mode, NavisWorks doesn't know what level of item to start selecting at - do you mean the whole model, or the layer, or the instance, or group, or just the geometry? The selection resolution tells NavisWorks what level in the selection tree to start selecting items at by default.

The options are:

- **Model**
Selects the whole model.
- **Layer**
Selects all items on a layer.
- **First Object**
Selects the first item in the selection tree path that isn't a layer.
- **Last Unique**
Selects the most specific item (furthest along the selection tree path) that is unique (not multiply instanced).
- **Last Object**
Selects the most specific item (furthest along the selection tree path) that is marked as a composite object. If no composite object is found, the geometry is selected. This is the **Default** selection resolution setting.

- Geometry

Selects the last item in the selection tree path (most specific, but may be multiply instanced).

If you find you have selected the wrong level of item, you can interactively "cycle" through the selection resolution, without having to go to the options dialog or the selection tree. You do this by holding down the **Shift** key when selecting an item. This selects an item one level more specific each time you select the item until the resolution gets to "geometry", at which point it will revert back to "model". The selection resolution remains as set in options for the next selection.

As well as being able to set the default selection resolution on the Selection page in the **Options Editor**, a quicker way is to right-click on any item in the selection tree and choose the menu item **Set Selection Resolution to X**, where X is one of the above selection resolutions.

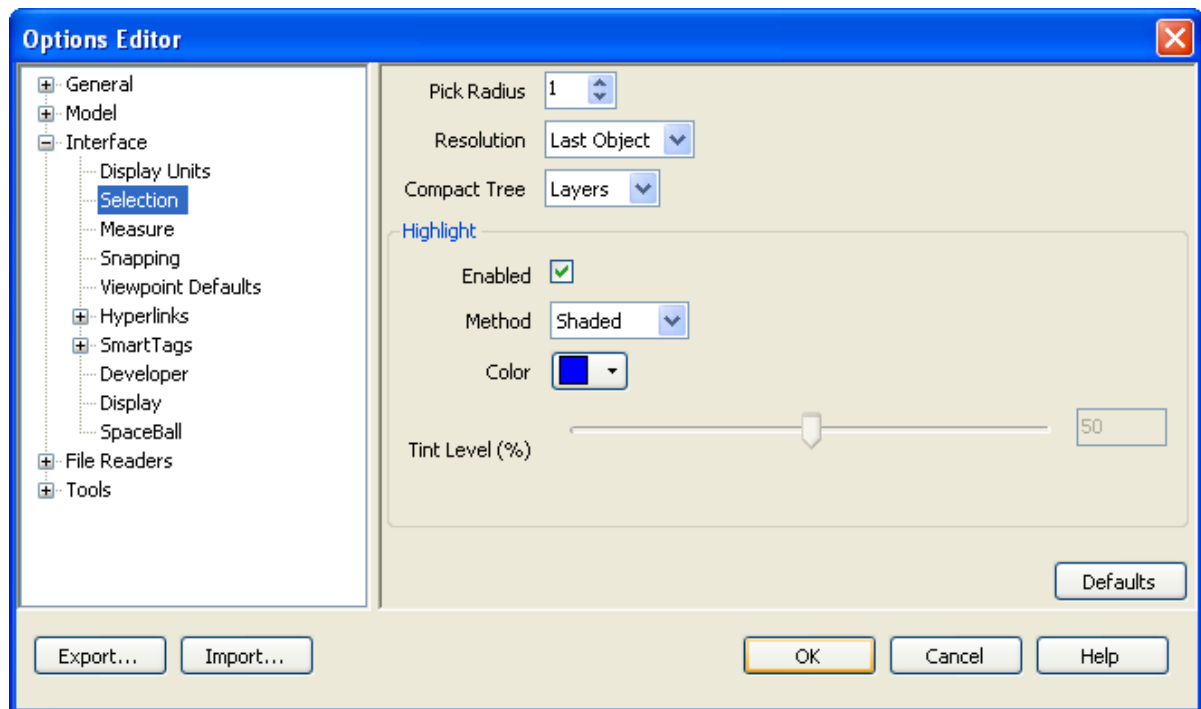
Selection Options

Use the **Selection** options to configure how you select items in the NavisWorks scene. You can set the level at which you select items (selection resolution), the distance from an item you have to be for it to be selected (useful for lines and points) and also the color in which selected items are displayed.

Setting selection options:

1. On the **Tools** menu, click **Global Options**.
2. Expand the **Interface** node in the **Options Editor** dialog box, and click the **Selection** option.

The **Selection** page is displayed.



3. To set the color that selected items are displayed in, click the **Color** button. The default highlight color is blue. Alternatively, clear the **Enabled** check box to disable selected item highlighting (items won't change color when selected).
4. In the **Pick Radius** box, enter the radius, in pixels, that an item has to be within in order for it to be selected.
5. In the **Resolution** box, choose the level of selection that you wish to use as the default, see selection resolution.
6. In the **Compact Tree** box, choose what level of detail you wish to see in the selection tree. **Models** will restrict the tree to just displaying model files, **Layers** will restrict it down to the layer level and **Objects** will show a similar tree to the **Standard** tree, but without the levels of instancing inserted above an inserted block.
7. Click **OK** to set the options or **Cancel** to exit the dialog box without setting them.

Chapter 14. Finding

Finding is a quick and powerful way of selecting items into the current selection based on items' properties. These "searches" can then be saved (see "[Saving Selection and Search Sets](#)") and re-run in later sessions.

You can also find text inside comments using the Find Comments functionality.

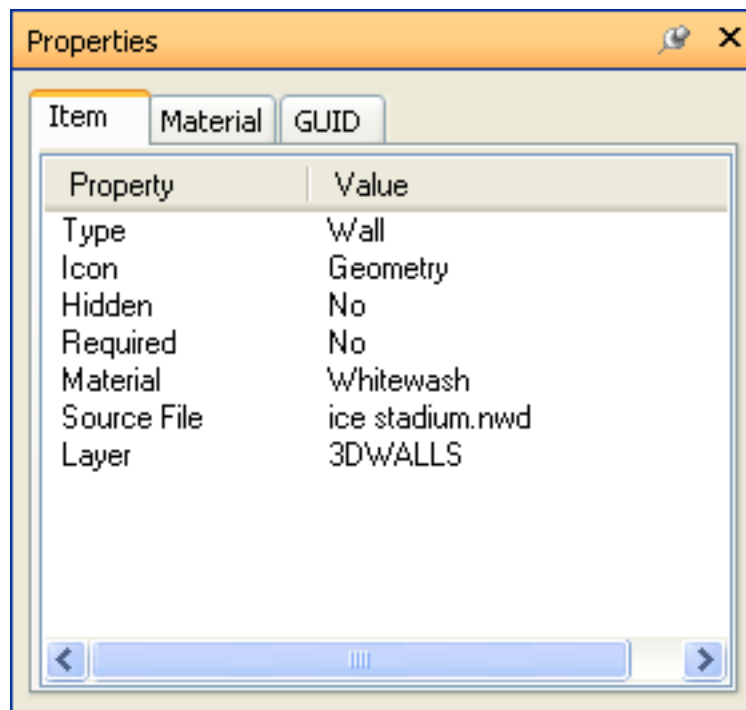
Properties


The **Properties** control bar shows all the properties of a selected item. Properties are categorized into categories such as **Item** and **Material** and this control bar has a tab for each property category of the selected item. Whenever a single item is selected, this control bar will be updated to show the properties of that item.

Note:

If more than one item is selected the **Properties** bar will only show the number of items selected and won't show any property information.

The **Properties** control bar looks like this:



To activate it, click the **Properties** button  on the **Workspace** toolbar, or on the **View** menu, click

Control Bars > Properties.


Hyperlinks are also classed as a property category and so can be added and edited from this control bar using the shortcut menu. See "[Hyperlinks](#)" for more details on hyperlinks.

NavisWorks will also convert many different CAD application object properties, such as those from Architectural Desktop™ or MicroStation TriForma™.

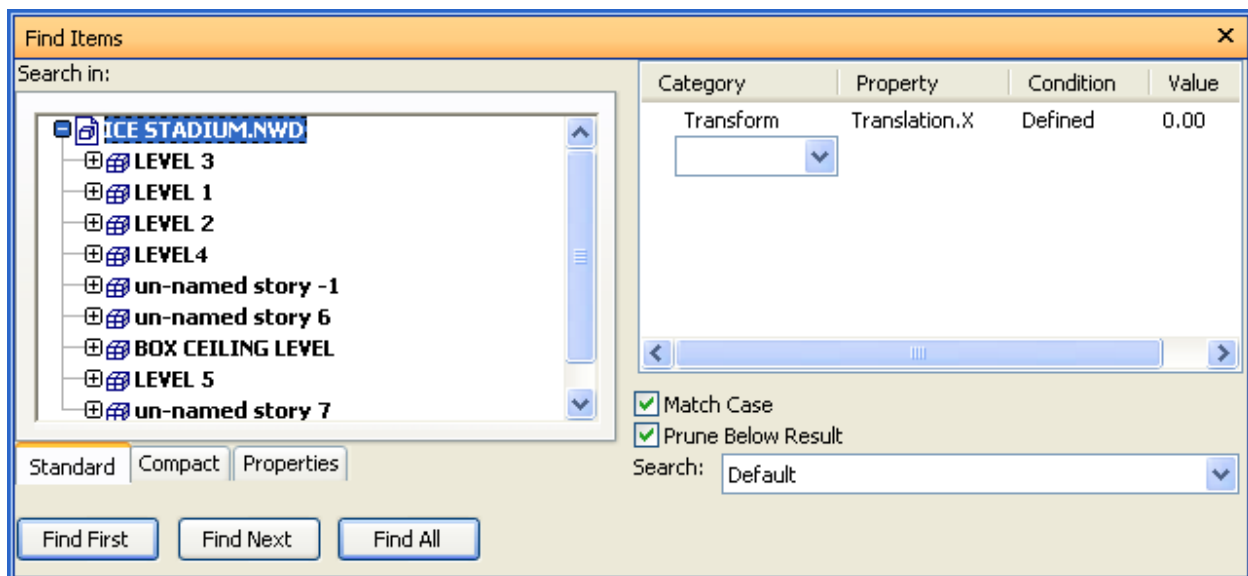
Every property has a type associated with it, for example, an item's **Name** is a string, and so on. Internal file properties, such as transform and geometry properties, are not shown by default. If you want to view this information, use a developer profile by selecting the **Show Internal Properties** check box on the Developer page of the **Options Editor** dialog box.

Properties can be brought in from an external database and shown inside database-specific tabs in the **Properties** control bar. See [Chapter 25, DataTools](#) for more details on how to bring through object properties using DataTools.

Finding Items

In NavisWorks, searching the model for items based on their properties is quick and simple using the **Find Items** control bar. To access it, on the **View** menu, click **Control Bars > Find Items**, or click the **Find Items** button  on the **Workspace** toolbar. Alternatively, click **Edit > Find Items**.

The **Find Items** control bar looks like this:



Notice that the selection trees occupy the left half of this bar, allowing you to refine your searches further within a specific hierarchy. See [“Selection Trees”](#) for more information on the selection trees. Simply click the selection tree tab that best suits your current search.

Finding items based on properties:

1. If it's not already open, open the **Find Items** control bar as outlined above.
2. Choose the selection tree tab that best suits your search. For example, if you know you are limiting your find to within a specific selection set, then click the **Sets** tab.
3. Choose the items where you want to start the find from. For example, if you know you want to search

the whole model, then choose the file or files from the **Standard** tab that comprise the model. You could also select several selection sets to limit your find to these items in the sets.

Note:

You can right-click the selection tree and choose from **Import Current Selection** to quickly select the items currently selected for the search, or conversely, **Set As Current Selection** to set the current selection to that you have already selected in the find selection tree.

4. The right-hand side of the bar contains a list box with four columns, **Category**, **Property**, **Condition**, and **Value**. This is where the find specification is set up. In this list box, you define a series of conditions which are, by default, logically ANDed together as follows:
 - Each condition is started by clicking the next available line under the **Category** column and from the ensuing drop-down list, choosing which category the property you wish to search for is in. Only the categories that are contained in the scene are available in the drop-down list.
 - After choosing the category, then choose the property you wish to test for in the **Property** drop-down list which will then be available. Again, only the properties in the scene within the category chosen will be available.
 - Then, from the following **Condition** drop-down list, choose the condition you wish to test for. This will depend on the type of property you are searching for. For example, you can choose **Contains** to search for a series of letters within a string. **Wildcard** means you can use wildcards in the **Value** field to allow matching against any character or an arbitrary sequence of characters. The symbol **=** means "exactly equals" and can be used for any type of property. The mathematical symbols, **<**, **>**, **<=** and **>=** apply to number types and mean "less than", "greater than", "less than or equal to", and "greater than or equal to" respectively. Also available are **Defined** and **Undefined** to mean "anything" (in other words, it's there) and "nothing" (in other words, it's not there) respectively.
 - Finally, if you didn't choose either **Defined** or **Undefined** in the **Condition** column, you have to define the **Value** you want to match in the find. You can either type in a value freely in the text box, or choose a pre-defined value from the drop-down list which shows all values in the model available within the category and property you defined earlier. If you chose **Wildcard** in the **Condition** column you can type in a value with wildcards. To match one single unspecified character use the symbol **?**, for example, a **Value** field of "b??ck" will match "brick" and "block". To match any number of unspecified characters, use the symbol *****, for example, a **Value** field of "b*k" will match "bench kiosk", "brick" and "block". Similarly, a **Value** field of "*b*k*" will match "bench kiosk", "brick" and "block" and also "Coarse bricks" and "block 2".
5. Continue to add conditions to the find specification. Each condition you add will by default be logically ANDed with the others. See the example below for a better explanation of the logic.
6. You can logically negate any condition by selecting the condition, then right-clicking the list box and choosing **Negate Condition**. See the example below for a better explanation of the logic.
7. Instead of the condition being logically ANDed, you can also logically OR a condition by selecting the condition, then right-clicking the list box and choosing **Or Condition**. All conditions following this condition are logically ANDed together and will be logically ORed with all conditions preceding this condition (which are in turn logically ANDed together). A small "plus" will appear next to an ORed condition. See the example below for a better explanation of the logic.
8. To delete the selected condition, right-click the list box and choose **Delete Condition** from the shortcut menu. Alternatively, to delete all the conditions in the find specification, choose **Delete All**

Conditions from the shortcut menu.

9. The shortcut menu that appears when right-clicking the list box also contains several **Ignore Category ...** and **Ignore Property ...** options. See [User Name and Internal Name](#) for details on what these mean.
10. Select the **Match Case** check box if you want the find to respect the upper and lower case letters in strings. You can also define case sensitivity at the condition level by selecting the condition, right-clicking the list box and choosing **Ignore String Value Case** from the shortcut menu. This will then ignore that condition's case when making comparisons. The **Match Case** check box should gray out, showing that some conditions are case sensitive and other are not.
11. Select the **Prune Below Result** check box if you want to stop searching a branch of the selection tree as soon as an item that matches the find specification is found.
12. From the **Search** drop-down list, select the type of search you want to perform.
 - **Default** searches all items selected in the selection tree, along with the paths below these items, for matches with the search.
 - **Below Selected Paths** only searches below the items selected in the selection tree for matches with the search.
 - **Selected Paths Only** only searches within the items selected in the selection tree for matches with the search.
13. Click **Find First** for the first item in the selection tree to match any of the find specification, **Find Next** to find the next item in the tree, and **Find All** to find all items matching the specification.
14. You can click **Abort Search** at any time during a lengthy search to cancel the search.
15. Any items found will be selected in the selection tree and main navigation window.

Note:

A small "star" will appear next to any condition that does not have the default settings, such as if you negate the condition or select one of the **Ignore...** items on the shortcut menu.

Find Item Example

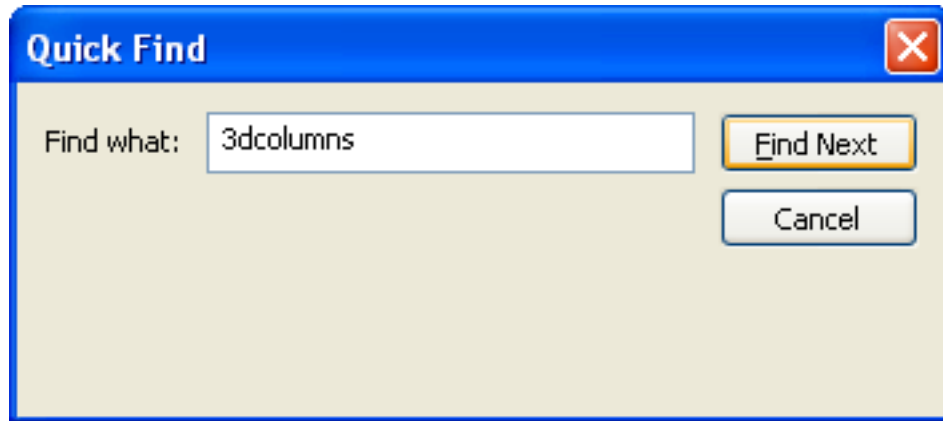
Let's say, you have set up four conditions in the search called C1, C2, C3 and C4. If you want to search for (C1 AND C2) OR (C3 AND NOT C4), then you would select condition 3 and choose **Or Condition** from the shortcut menu, and then select condition 4 and choose **Negate Condition** from the shortcut menu. So all conditions following the OR are ANDed together and this group of conditions is ORed with the first group of conditions, which are also ANDed together. In other words, the precedence is NOT, then AND, then OR.

Quick Find

As well as the more comprehensive and powerful **Find Item** feature (see "[Finding Items](#)"), NavisWorks also offers a simpler and quicker **Quick Find**. This simply searches for a string (case insensitive) in all property names and values attached to items in the scene.

Quickly finding items from a string:

1. On the **Edit** menu, click **Quick Find** or press **Ctrl-F**. The **Quick Find** dialog box will appear:



2. Type in the string you want to search for in all items' properties. This search is not case sensitive.
3. Click **Find Next** to find the next item in the selection tree containing this string or **Cancel** to return to NavisWorks.
4. If any items contain properties with the string being searched for, the next one in the selection tree will be highlighted and the search stopped.
5. To repeat the search, simply press **F3** or click **Quick Find Next** on the **Edit** menu. If any more items contain properties with the string, the next one in the selection tree will be highlighted and the search stopped.

Finding Comments

As well as finding items by property, you can also search the comments attached to items, clash results and selection sets using the **Find Comments** control bar. For more information on what comments are and how to attach them to items, see "[Commenting](#)".

To access it, on the **View** menu, click **Control Bars > Find Comments**, or click the **Find Comments** button  on the **Workspace** toolbar, or click **Edit > Find Comments**. Alternatively, on the **Review** menu, click **Comments > Find Comments**.

The **Find Comments** control bar looks like this:

Name	Comment	Date	Author	ID
Cafe	New comment	11:36:...	keyg	1

Finding comments:

1. If it's not already open, open the **Find Comments** control bar as outlined above.
2. Type in the text that you want to search for in the **Text** box.

Note:

You should use the "*" wildcard (without the quotes) to match an arbitrary series of letters either before or after the text you enter here. For example, if you want to find all comments containing the word "redline", you should enter "*redline*" in the box, otherwise you will only find comments that contain only the "redline" word, which probably won't be many!

3. If you want to restrict your search to comments made by a single author, then type in the name of that author in the **Author** box.
4. If you know the ID of the comment you want to find, enter this in the **ID** box.
5. If you want to restrict your search to comments of a particular status, select the required status from the **Status** drop-down list.
6. Select the **Match Case** check box if you want the search to respect lower and upper case characters in the search.
7. You can refine the search further by clicking the **Date Modified** tab to select a date range within which the comment must have been made.

8. You can click the **Source** tab and select the relevant check boxes for **Selection Sets**, **Viewpoints** or **Redline Tags** to restrict the search by the source that the comment is attached to.

Note:

If the **Text**, **Author**, **ID** and **Status** boxes are left empty, the search will return all comments within the **Date Modified** and **Source** restrictions.

9. Click **Find** to search for the comments.
10. If any comments are found, they will be listed in the box at the bottom of the control bar. Selecting a comment will also select the source of the comment. For example, selecting a comment which originated from a saved viewpoint will select that viewpoint.

If new comments are added, the results list will be cleared.

Chapter 15. Editing

As NavisWorks is a design review tool, editing is restricted to simple temporary "overrides" of items' properties, so that they can always be reset to the state they were in when imported from the CAD file. You can override an item's position by holding onto the item while navigating and then dropping it in a new position, or move it by overriding its transform. Also you can edit an item's color, transparency, and hyperlinks. In addition, you can hide and reveal items and make them required and unrequired to control their drop out during navigation. Finally, you can also edit a file's transform, or in other words, its origin location, scale, rotation and so on, so that it fits within the scene when appending multiple models from potentially different sources and CAD applications.

Most editing is done from the **Edit** menu, which includes the following items:



- Undo
- Redo
- Select
- Quick Find
- Quick Find Next
- Find Items
- Find Comments
- Hidden
- Required
- Unselected Hidden
- Override Item
- Reset Item
- Reset All
- File Units and Transform

The three main editing functionalities not available from the **Edit** menu are hyperlinks, holding items and object manipulation.

Holding and releasing objects

When navigating around a model in NavisWorks it is possible to "pick up" or hold selected items and move around with them in the model. For example you may be viewing a plan for a factory and would like to see different configurations of machine layouts.

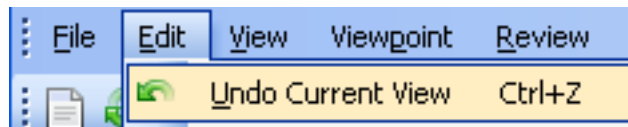
Holding and releasing items:

1. Select the item(s) to be held for moving.
2. On the **Viewpoint** menu, click **Navigation Tools > Hold**
or
Click **Hold**  on the **Navigation Tools** toolbar.
3. The selected item(s) are now held and will move with you through the model when you use the normal navigation modes i.e. Walk, Pan etc.
4. To release the held item, click **Hold**  on the **Navigation Tools** toolbar again.

To reset the item to its original position, see “ [Resetting Items' Positions](#) ”.

Undo/Redo

You can undo or redo your actions in NavisWorks. The **Edit > Undo** and **Edit > Redo** menu item states what type of action you will undo/redo.



To undo an action:

- On the **Edit** menu, click **Undo**

or

- Press **Ctrl-Z**

or

- Click **Undo**  on the **Standard** toolbar

Repeat as many times as required or your options allow.

To redo an action:

- On the **Edit** menu, click **Redo**

or

- Press **Ctrl-Y**

or

- Click **Redo**  on the **Standard** toolbar

Repeat as many times as required, or your options allow.

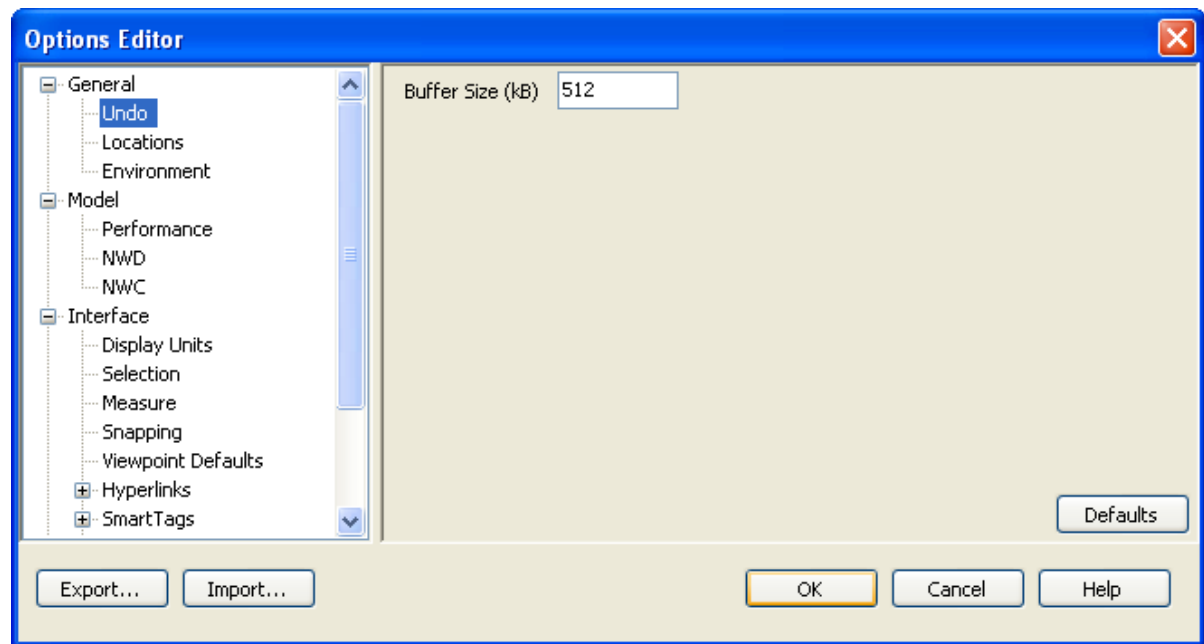
Undo Options

You can set the amount of space you wish to allocate to the undo buffer. The default settings should be adequate for most normal usage.

Setting undo options:

1. On the **Tools** menu, click **Global Options**.
2. Expand the **General** node in the **Options Editor** dialog box, and click the **Undo** option.

The **Undo** page is displayed:



3. Set the amount of space you wish to allocate for saving undo/redo actions.
4. If you want to return to the system default values, click the **Defaults** button.
5. Click **OK** to set these options or **Cancel** to exit the dialog without setting them.

Hiding Items

This command hides the current selection and allows you to hide and reveal items by toggling on and off.


Note:

In the selection tree the object will appear gray when hidden.

Hiding an item:

1. Select the item(s) that you want to hide (see [Chapter 13, *Selecting Items*](#) for more information on how to do this).
2. On the **Edit** menu, click **Hidden**

or

Click **Hidden**  on the **Selection Tools** toolbar.

Making items required

This option makes the current selection required for rendering which means that they will always be rendered during navigation and not drop out. The command allows you to make an item required or unrequired by toggling on and off.

Note:

A *Required* item may also be *Hidden*. In the selection tree the object will appear red when required.

Making an item required:

1. Select the item(s) that you want to make required (see [Chapter 13, *Selecting Items*](#) for more information on how to do this).
2. On the **Edit** menu, click **Required**

or

Click **Required**  on the **Selection Tools** toolbar.

Hiding Unselected Items

This command hides all items except those currently selected so that they are not drawn in the main view.

The command allows you to hide and reveal the hidden items by toggling on and off.

Note:

In the selection tree the items will appear gray when hidden.

Hiding all non-selected items:

1. Select the item(s) that you want to remain visible (see [Chapter 13, *Selecting Items*](#) for more information on how to do this).
2. On the **Edit** menu, click **Unselected Hidden**.

or

Click **Unselected Hidden**  on the **Selection Tools** toolbar.

Overriding Item Properties

Various item properties, such as material (color and transparency) and hyperlinks, can be temporarily overridden in the scene for design review. These overrides are saved into .nwf files for future use and any material overrides can be optionally saved into viewpoints (see “[Viewpoints Options](#)”).

Overriding Color

This option allows a user-defined color to be added to an item in the scene. The old color is saved in case it needs to be reset later.

Overriding an item's color:

1. On the **Edit** menu, select **Override Item > Override Color**

or

Right-click the item and select **Override Color**.

2. Select a color from the color-chooser and click **OK**.

Note:

Any materials applied with the Presenter tool will supersede any color overrides.

Overriding Transparency

This option allows a user-defined transparency to be added to an item in the scene. The old color is saved in case it needs to be reset later.

Overriding an item's transparency:

1. On the **Edit** menu, select **Override Item > Override Transparency**
or
Right-click the item and select **Override Transparency**.
2. Use the slider to select level between opaque and transparent and click **OK**.

Note:

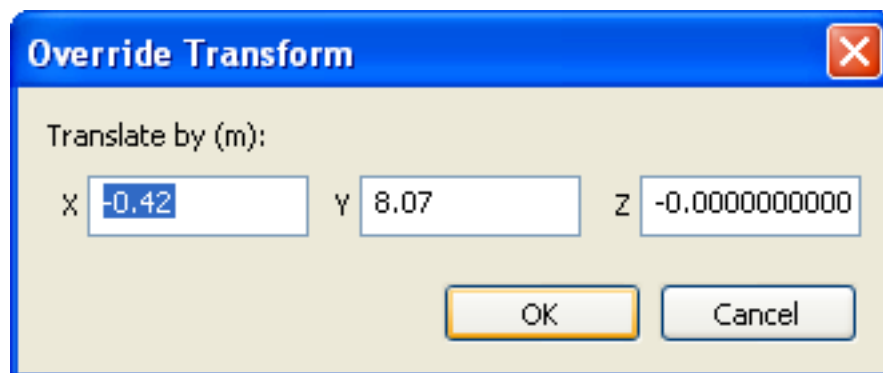
Any materials applied with the Presenter plugin will supersede any transparency overrides.

Overriding Transforms

This option allows a user-defined transform to be applied to the position of an item in the scene. The original position of the item is saved in case it needs to be reset later.

Overriding an item's transform:

1. Select the item(s) that you wish the transform to be applied to (see [Chapter 13, Selecting Items](#) for more information on how to do this).
2. On the **Edit** menu, select **Override Item > Override Transform**
or
Right click on the selected item(s) and select **Override Transform...** from the shortcut menu.
The **Override Transform** dialog box is displayed:



3. Enter the XYZ values of the transform to be applied to the item(s). For example, a transform of (0, 0, 1) will reposition an item by one unit in the Z direction.
4. Click **OK** to apply the transform, or **Cancel** to return to NavisWorks without applying it.

Also see “[Transforming Objects](#)” for more information on interactively transforming objects.

Overriding Hyperlinks

As well as hyperlinks being converted from the native CAD files you open in NavisWorks, you can also "override" an item's hyperlinks by attaching multiple additional hyperlinks to it. Because hyperlinks are treated as a property by NavisWorks, they can be searched on with the **Find Items** tool and displayed in the **Properties** bar. They are also saved into NavisWorks files so that as the model changes, the links remain for you and others to view.

See “[Hyperlinks](#)” for more information on overriding hyperlinks.

Resetting Overriden Properties

Once an override has been applied to an item, you simply reset that override to return it to the value that it had when the file was originally converted from the native CAD file.

Resetting Colors and Transparencies

This option restores the original items' color *and* transparency to the selected items.

Note:

You cannot reset an item's color separately from its transparency - they are always reset together.

To reset color and transparency:

- On the **Edit** menu, click **Reset Item > Colors and Transparencies**.

Resetting Hyperlinks

This option restores the original items' hyperlinks to the selected items and removes any hyperlinks that have been added in the model since.

To reset hyperlinks:

- On the **Edit** menu, click **Reset Item > Reset Hyperlinks**.

Resetting Items' Positions

This option restores the original items' positions to the selected items, after it has been moved using the Hold Item command, Transformed, or Repositioned.

To reset an item's position:

- On the **Edit** menu, click **Reset Item > Reset Transform**

or

- Right-click the item and choose **Reset Transform**.

Resetting All Overriden Properties

Once an override has been applied to several items, you can reset them all at once to return them to the values that they had when the file was originally converted from the native CAD file.

Resetting All Colors and Transparencies

This option restores all items in the scene to their original colors and transparencies.

Note:

Items' colors cannot be restored separately from their transparencies.

To reset all materials:

- On the **Edit** menu, click **Reset All > Colors and Transparencies**.

Resetting All Items' Hyperlinks

This option restores all items hyperlinks to the original state that they were in when the model was imported into NavisWorks.

To restore all items hyperlinks:

- On the **Edit** menu, click **Reset All > Reset All Hyperlinks**.

Revealing All Items

This option reveals (unhides) all items.

To reveal all items:

- On the **Edit** menu, click **Reset All > Unhide All**.

Making All Items Unrequired

This option makes all items unrequired so that no items are forced to be rendered during navigation.

To make all items unrequired:

- On the **Edit** menu, click **Reset All > Unrequire All**.

Resetting All Items' Positions

This option restores the original positions of any items that have previously been held, transformed and repositioned around the model.

To restore all items positions:

- On the **Edit** menu, click **Reset All > Reset Transforms**.


Custom Properties

Property information brought into NavisWorks from a CAD application cannot be edited, with the exception of color, transparency and hyperlinks, as described in the previous section. You can, however, add your own custom information to any item in the model scene.

Add User Data Tab

This option allows a user-definable tab to be added to the **Properties** control bar.


Adding a new user data tab:

1. If it's not already displayed, on the **View** menu, click **Control Bars > Properties**, or click **Properties**  on the **Workspace** toolbar, to open the **Properties** control bar.
2. Select the item in the NavisWorks scene to which you wish the new data tab to be associated with.
3. Right-click the **Properties** control bar and select **Add New User data Tab**.

Rename User Data Tab

This option allows a user-definable tab to be renamed in the **Properties** control bar.


Renaming a user data tab:

1. If it's not already displayed, on the **View** menu, click **Control Bars > Properties**, or click **Properties**  on the **Workspace** toolbar, to open the **Properties** control bar.
2. Select the user data tab you wish to rename.
3. Right-click the **Properties** control bar and select **Rename Tab**.
4. Enter a new name for the tab, then click **OK**, or click **Cancel** to return to NavisWorks without renaming the tab.

Add New Property

This option allows a custom property to be added to a user data tab in the **Properties** control bar.


Adding a new property to a user data tab:

1. If it's not already displayed, on the **View** menu, click **Control Bars > Properties**, or click **Properties**  on the **Workspace** toolbar, to open the **Properties** control bar.
2. Select the user data tab you wish to add the new property to.
3. Right-click the **Properties** control bar and select **Insert New Property**, then select the property type you wish to add:
 - **String**. Select this property type if the value you wish to add is a string.
 - **Boolean**. Select this property type if the value you wish to add is **Yes** or **No**.
 - **Float**. Select this property type if the value you wish to add is a decimal value, for example 1.234.
 - **Integer**. Select this property type if the value you wish to add is a positive whole number (1, 2, 3,...), a negative whole number (-1, -2, -3,...), or zero (0).

Edit Property Value

This option allows the value of a custom property to be edited in the **Properties** control bar.

Editing the value of a custom property:

1. If it's not already displayed, on the **View** menu, click **Control Bars > Properties**, or click **Properties**  on the **Workspace** toolbar, to open the **Properties** control bar.
2. Select the user data tab containing the custom property whose value you wish to edit.
3. Right-click the **Property** whose value is to be edited and select **Edit Property Value**.

Note:


For **Boolean** properties, select **Set Value** then **Yes** or **No** from the list.

4. Enter the new value for the property, ensuring it is valid for the property type.
5. Click **OK** to accept the edit, or **Cancel** to return to NavisWorks without editing the property value.

Rename Property

This option allows you to rename a custom property added to a user data tab in the **Properties** control bar.


Renaming a custom property:

1. If it's not already displayed, on the **View** menu, click **Control Bars > Properties**, or click **Properties**  on the **Workspace** toolbar, to open the **Properties** control bar.
2. Select the user data tab containing the custom property you wish to rename.
3. Right-click the **Property** to be renamed and select **Rename Property**.
4. Enter the new name for the property then click **OK**, or **Cancel** to return to NavisWorks without renaming the property.

Delete Property

This option allows you to delete a custom property added to a user data tab in the **Properties** control bar.


Deleting a custom property:

1. If it's not already displayed, on the **View** menu, click **Control Bars > Properties**, or click **Properties**  on the **Workspace** toolbar, to open the **Properties** control bar.
2. Select the user data tab containing the custom property you wish to delete.
3. Right-click the **Property** to be deleted and select **Delete Property**.

Delete User Data Tab

This option allows you to delete a user data tab from the **Properties** control bar.

Deleting a user data tab:

1. If it's not already displayed, on the **View** menu, click **Control Bars > Properties**, or click **Properties**  on the **Workspace** toolbar, to open the **Properties** control bar.
2. Select the user data tab you wish to delete.
3. Right-click the **Properties** control bar and select **Delete User Data Tab**.

Setting a File's Units and Transform

You may need to use this feature when working with Clash Detective and/or Presenter, where it's important to have the model in the correct units and scale, to ensure clash results are accurate and materials are applied correctly. You may also find this useful if you append several models from different sources into the same scene and the scale, rotation and origin of some models need amending to match the other models.

The first thing to try, however, before attempting to manually adjust the file's transform, is to check that the units are ok. See "[Units](#)" for a discussion of units and how to adjust them.

Note:

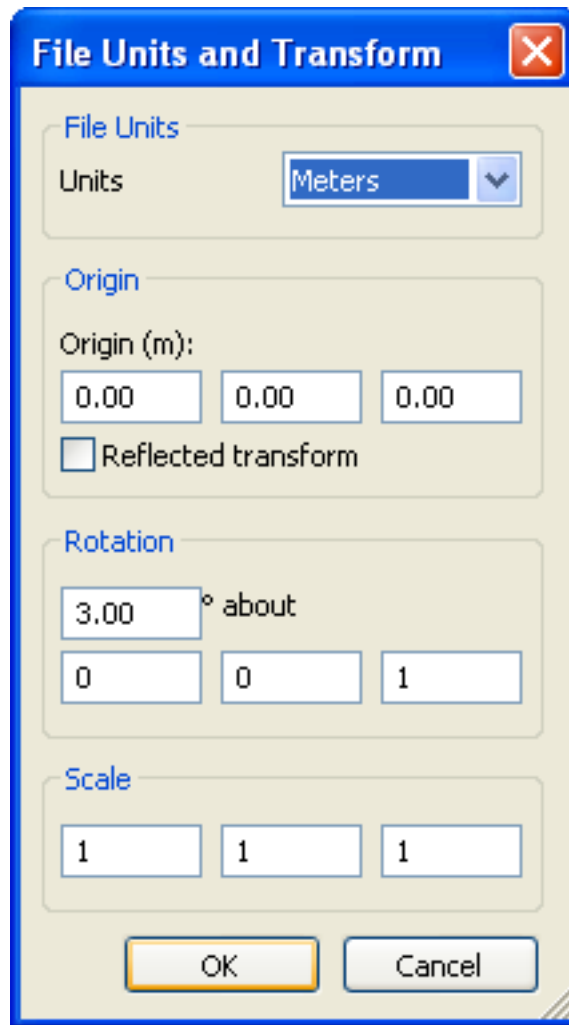
If you select an item that is inside the file and do a **File Transform** on it, the whole file will be transformed - not just the item selected. To transform a specific item within a file you will need to use the **Override Item Transform** function.

Also, only single files can be transformed at one time - this command is not available if multiple files/items are selected.

Setting a file's transform:

1. In the selection tree, select the file that you wish to transform the scale, origin or rotation of.
2. On the **Edit** menu, select **File Units and Transform**.

The **File Units and Transform** dialog box will appear:



The image shows a 'File Units and Transform' dialog box with a blue title bar and a close button (X) in the top right corner. The dialog is divided into four sections: 'File Units', 'Origin', 'Rotation', and 'Scale'. The 'File Units' section has a 'Units' dropdown menu set to 'Meters'. The 'Origin' section has three input fields for 'Origin (m):' all set to '0.00', and a 'Reflected transform' checkbox which is unchecked. The 'Rotation' section has an input field for an angle set to '3.00' followed by '° about', and three input fields for axes set to '0', '0', and '1'. The 'Scale' section has three input fields for scaling factors, all set to '1'. At the bottom are 'OK' and 'Cancel' buttons.

Section	Field	Value
File Units	Units	Meters
Origin	Origin (m): x	0.00
	Origin (m): y	0.00
	Origin (m): z	0.00
	Reflected transform	<input type="checkbox"/>
Rotation	Angle	3.00
	Axis 1	0
	Axis 2	0
	Axis 3	1
Scale	Scale x	1
	Scale y	1
	Scale z	1

3. Move the model's location by entering model units for the x, y and z axis in **Origin**.
4. The **Reflected Transform** check box only needs to be selected if a negative scale has been set.
5. Change the rotation of an object by entering an angle of rotation and selecting the axis to rotate about (by entering a value greater than 0). The object rotates about its origin point.
6. Amend the size of the object by entering values greater than 0 (to proportionally scale an object ensure the x, y and z scale values are equal). A negative value will, in effect, flip the object inside out.
7. Click **OK**.

Chapter 16. Display Modes

The **Rendering Styles** toolbar controls the appearance of the model in the main navigation window. From here you can control the lighting effect, the rendering type and enable or disable the different types of primitives drawn. Linked with the display options (see “[Display Options](#)” later in this chapter) and file options (see “[File Options](#)”, this enables you to fully control the appearance of the NavisWorks main navigation window.

Rendering Styles

The rendering process interactively draws the scene's items in the main navigation window. You have a choice of one of four interactive lighting modes (full lights, scene lights, head light, or no lights), four rendering modes (full render, shaded render, wireframe or hidden line) and you can individually turn each of the five primitive types (surfaces, lines, points, snap points and text) on and off.

The **Rendering Style** toolbar looks like this:

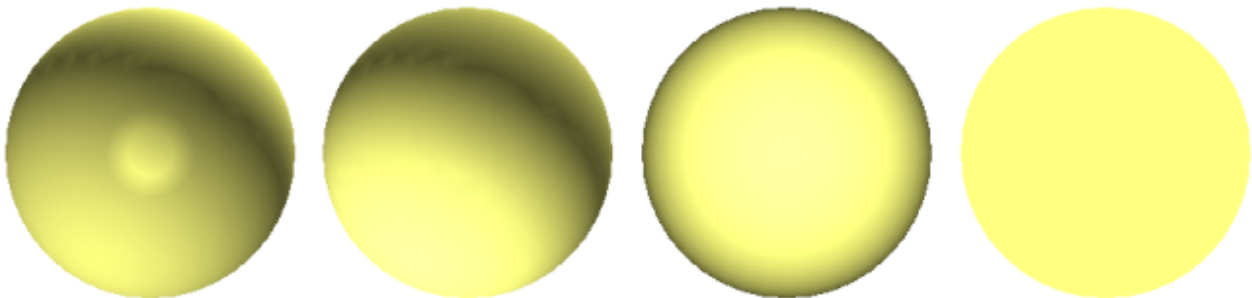


To access it, right-click any toolbar (for example, **Standard**) in the main navigation window, and click **Rendering Style** on the shortcut menu.

Lighting

Lights come through from various CAD file formats as scene lights. The intensity of the head light and scene lights can be set using the **File Options** under the **Tools** menu (see “[File Options](#)” for details on this).

The spheres below demonstrate the effect the lighting styles have on them. In order from the left, these are full lights, scene lights, head light and no lights.




No Lights

This option turns off lighting. The models are shaded with flat rendering.

To turn off all lights:

- On the **Viewpoint** menu, click **Lighting > No Lights**

or

- Click **No Lights**  on the **Rendering Style** toolbar.


Head Light

This option uses a single directional light located at the camera that always points in the same direction as the camera. You can set the head lights properties using Head Light options.

To turn on the head light:

- On the **Viewpoint** menu, click **Lighting > Head Light**

or

- Click **Head light**  on the **Rendering Style** toolbar.

Head Light options

Sliders are available to change the intensity of the scene's ambient light and headlight.

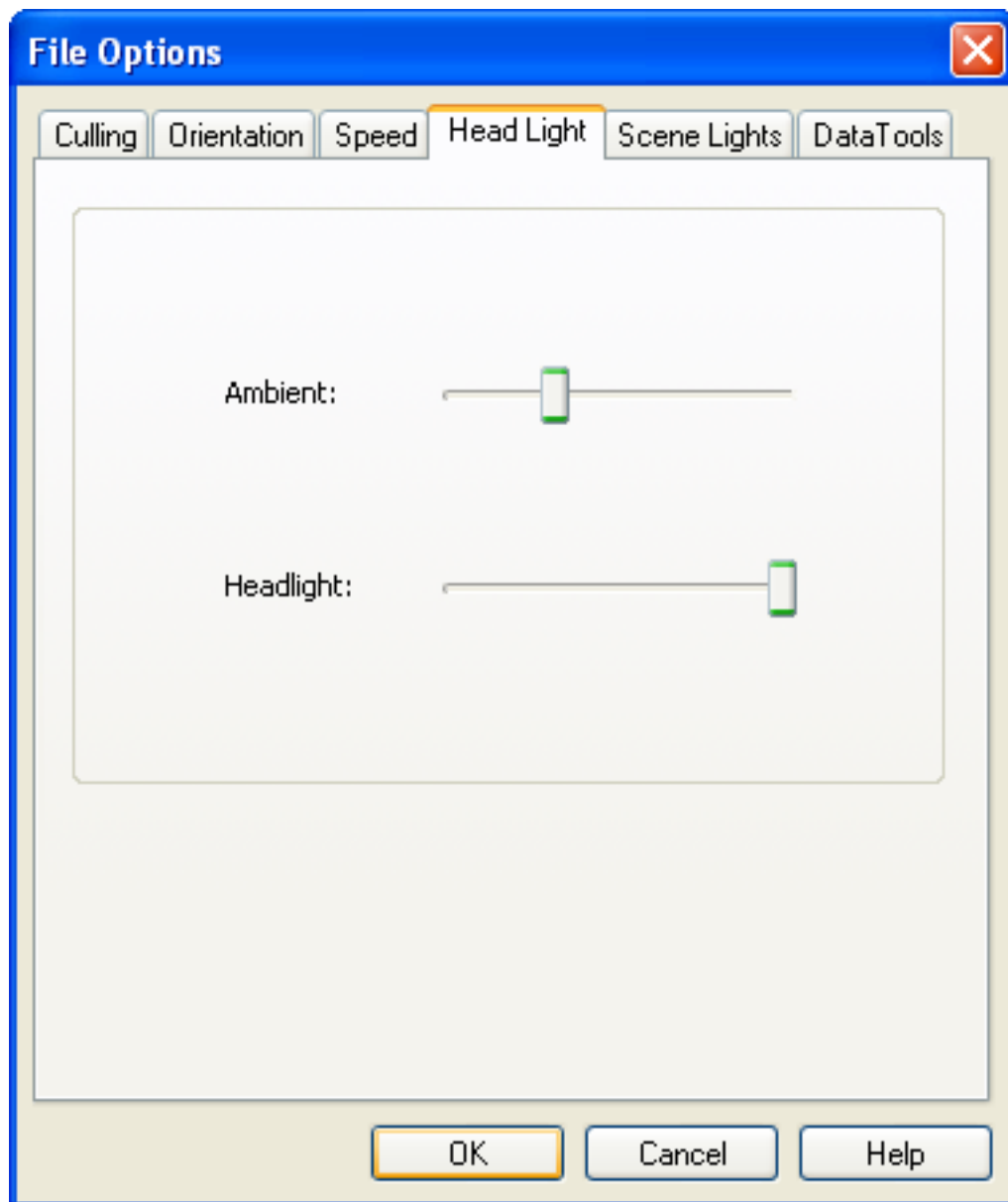
The **Ambient** slider controls the general overall brightness of the scene while the **Headlight** slider controls the brightness of the light located at the viewpoint.

Note:

Changes made in Head Light options will not be visible unless you have selected the **Head Light** rendering style.

Changing head light intensity:

1. On the **Tools** menu, click **File Options**.
2. In the **File Options** dialog box, click the **Head Light** tab.



3. Move the sliders to affect the ambient and head light intensities. You will see the effect your changes have on the scene in the main navigation window, as long as head light is selected as the rendering style.
4. Click **OK** to set these options or **Cancel** to exit the dialog box without setting them.


Scene Lights

This option uses whatever lights are defined in the model, or two default opposing lights, if none are available. You can set the scene lights properties using Scene Lights options.

To turn on scene lights:

- On the **Viewpoint** menu, click **Lighting > Scene Lights**

or

- Click **Scene lights**  on the **Rendering Style** toolbar.

Scene Lights Options

Sliders are available to change the intensity of the scene's lights.

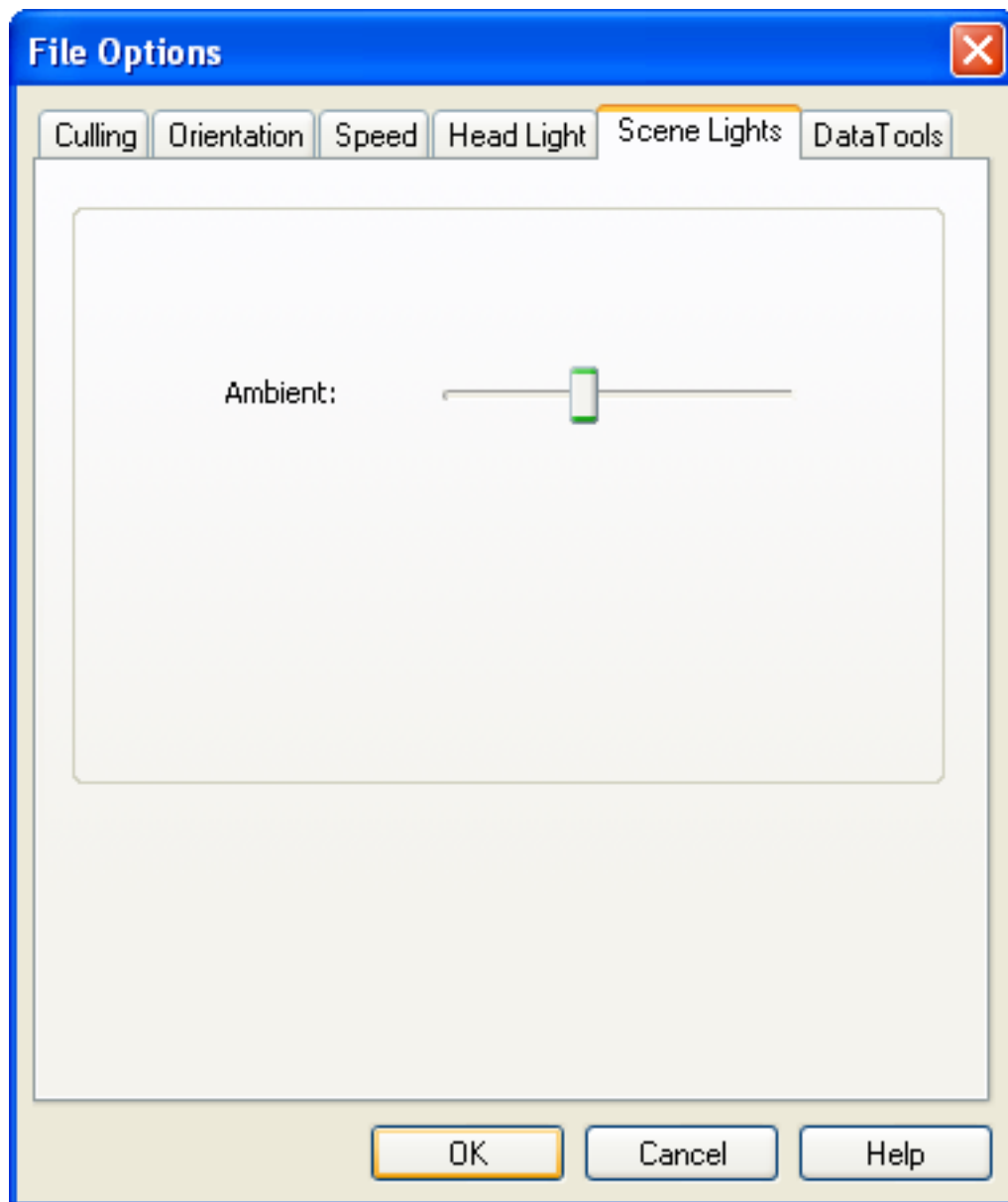
The **Ambient** slider controls the general overall brightness of the scene when scene lights is selected as the rendering style.

Note:

Changes made in Scene Lights options will not be visible unless you have selected the **Scene Lights** rendering style.

Changing scene light intensity:

1. On the **Tools** menu, click **File Options**.
2. In the **File Options** dialog box, click the **Scene Lights** tab.



3. Move the slider to affect the ambient intensity. You will see the effect your changes have on the scene in the main navigation window, as long as scene lights is selected as the rendering style.
4. Click **OK** to set these options or **Cancel** to exit the dialog box without setting them.


Full Lights

This option uses lights that have been defined with the Presenter tool.

To turn on full lights:

- On the **Viewpoint** menu, click **Lighting > Full Lights**

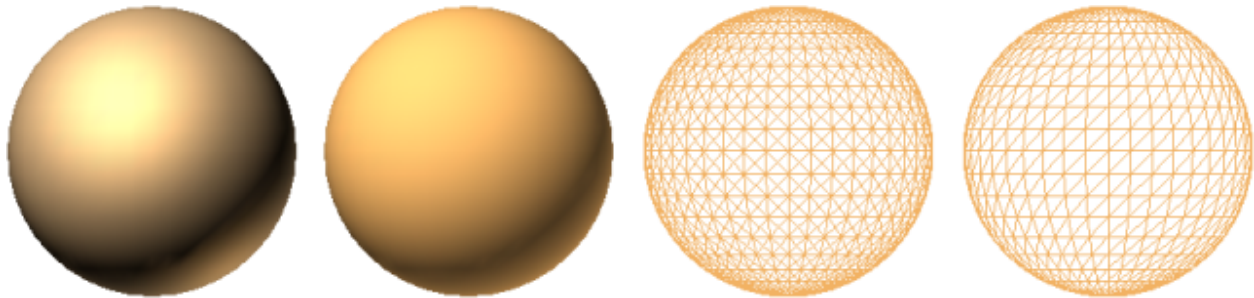
or

- Click **Full lights**  on the **Rendering Style** toolbar.

Render Modes

The four render modes affect how the items are rendered in the main navigation window.

The spheres below demonstrate the effect that the render modes have on their appearance. In order from the left, these are full render, shaded, wireframe and hidden line.




Full Render

This option renders the model with smooth shading including any Presenter materials that have been applied using NavisWorks Presenter or have been brought through from the native CAD file (although NavisWorks does not convert all native CAD file's textures - see [Chapter 10, Converting Files](#) for more details).

To select full render:

- On the **Viewpoint** menu, click **Rendering > Full Render**

or

- Click **Full Render**  on the **Rendering Style** toolbar.


Shaded Render

This option renders the model with smooth shading and without textures.

To select shaded render:

- On the **Viewpoint** menu, click **Rendering > Shaded**

or

- Click **Shaded**  on the **Rendering Style** toolbar.


Wireframe Render

This option renders the model in wireframe. As NavisWorks uses triangles to represent surfaces and solids, all triangle edges are visible in this mode.

To select wireframe render:

- On the **Viewpoint** menu, click **Rendering > Wireframe**

or

- Click **Wireframe**  on the **Rendering Style** toolbar.


Hidden Line Render

This option renders the model in hidden line. This requires a two pass rendering algorithm so is equivalent to rendering shaded and wireframe at the same time. The output is low quality as all the facet edges in the model are visible.

To select hidden line render:

- On the **Viewpoint** menu, click **Rendering > Hidden Line**

or

- Click **Hidden Line**  on the **Rendering Style** toolbar.

Display Primitives

The second part of the rendering style toolbar allows you enable and disable the drawing of surfaces, lines, points, snap points, and 3D text. Points are "real" points in the model, whereas snap points mark locations on other primitives, for example the center of a circle, and are useful for snapping to when measuring.


Surfaces

Surfaces are the triangles that make up the 2D and 3D items in the scene.

To toggle the rendering of surfaces on or off:

- On the **Viewpoint** menu, click **Display > Surfaces**

or

- Click **Surfaces**  on the **Rendering Style** toolbar.


Lines

As well as turning all lines on and off, it is possible to change the width of the lines. See “[Display Options](#)” for details on how to do this.

To toggle the rendering of lines on or off:

- On the **Viewpoint** menu, click **Display > Lines**

or

- Click **Lines**  on the **Rendering Style** toolbar.


Points

Points are real points in the model, for example, the points in a point cloud from a laser scan. As well as turning all points on and off, it is possible to change the number of pixels used to draw them. See “[Display Options](#)” for details on how to do this.

To toggle the rendering of points on or off:

- On the **Viewpoint** menu, click **Display > Points**

or

- Click **Points**  on the **Rendering Style** toolbar.


Snap Points

Snap points are implied points in the model, for example, the center point of a sphere or end points of a pipe. As well as turning all snap points on and off, it is possible to change the number of pixels used to draw them. See “[Display Options](#)” for details on how to do this.

To toggle the rendering of snap points on or off:

- On the **Viewpoint** menu, click **Display > Snap Points**

or

- Click **Snap Points**  on the **Rendering Style** toolbar.


Text

Text is the 3D text saved in the scene.

To toggle the rendering of text on or off:

- On the **Viewpoint** menu, click **Display > Text**

or

- Click **Text**  on the **Rendering Style** toolbar.

Background Color

This option allows you to select or mix a background color for the main view. Setting the background color is equivalent to setting a **Plain Background** on the **Effects** tab of the Presenter dialog box. This option is only available if you have the NavisWorks Presenter tool.

Setting the background color:

1. On the **Tools** menu, click **Background Color**.
2. Select the color from the Windows™ color palette.
3. Click **OK** to set the background color or **Cancel** to exit the dialog box without setting it.

Culling Options

There are three methods of culling objects in NavisWorks: backface, by area, and by near or far plane. All of these options are configurable using the **Culling** tab of the **File Options** dialog box.

Backface culling only draws the front face of every polygon in NavisWorks, which is clearly faster. Sometimes, however, the conversion process mixes up the front and back face of polygons and so you have to tell NavisWorks to draw both sides in order to not see right through some objects.

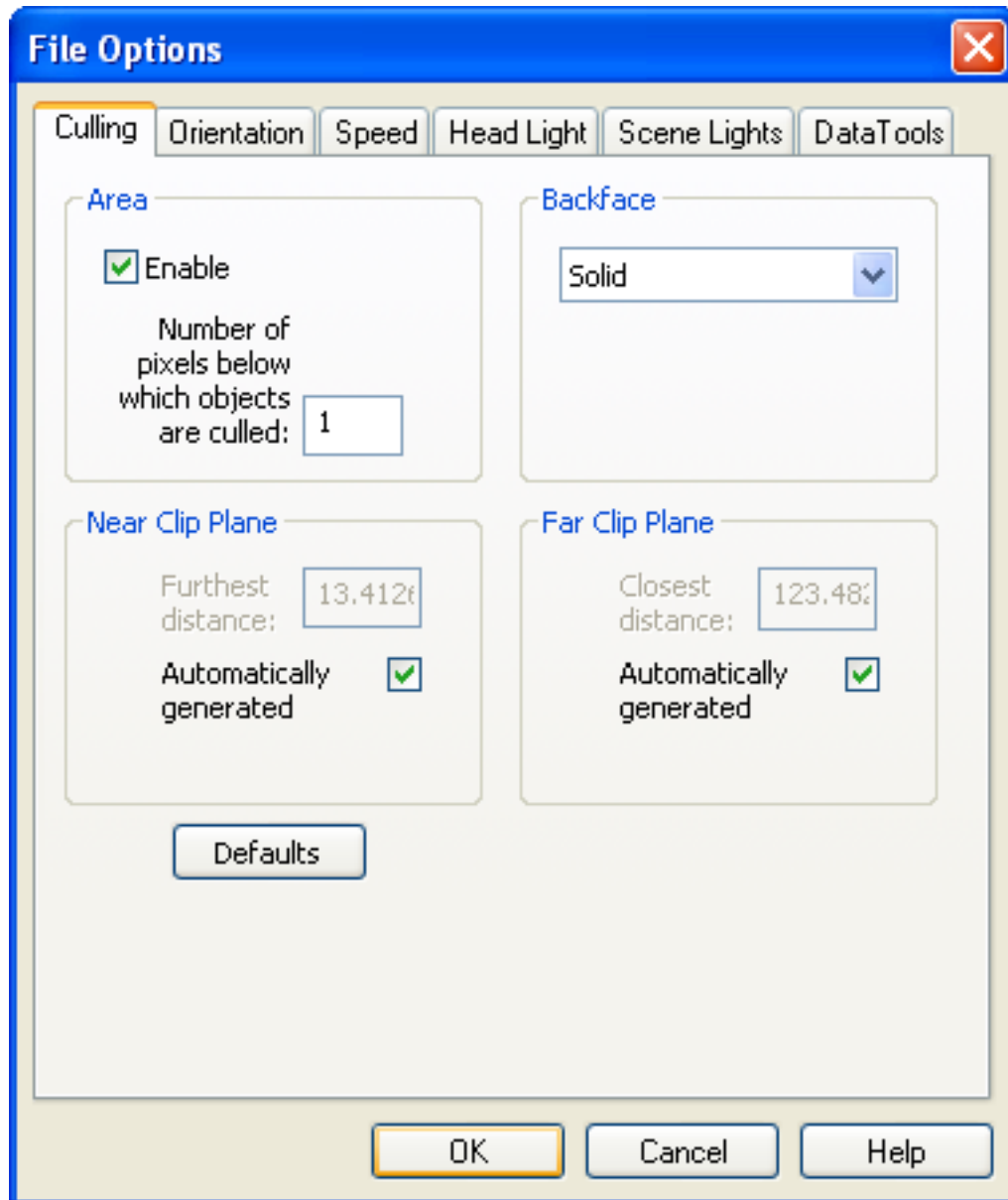
Area culling options allow you to set the size of objects within a model that will not be displayed. For example, if you were to set the value to 100 pixels any object within the model that would be drawn less than 10x10 pixels in size will not be displayed.

Culling options by near and far plane allows some degree of control over the resolution of the axis

perpendicular to the screen. NavisWorks uses the near and far clip plane to maximize the resolution of the model on screen. The near and far clip plane boxes dictate constraints for the near and far culling planes.

Setting culling options:

1. On the **Tools** menu, click **File Options**.
2. In the **File Options** dialog box, click the **Culling** tab.



3. Select the **Enable** check box under **Area** to enable the definition of the screen area (in pixels) below which objects are culled and type in the number of pixels in the box.

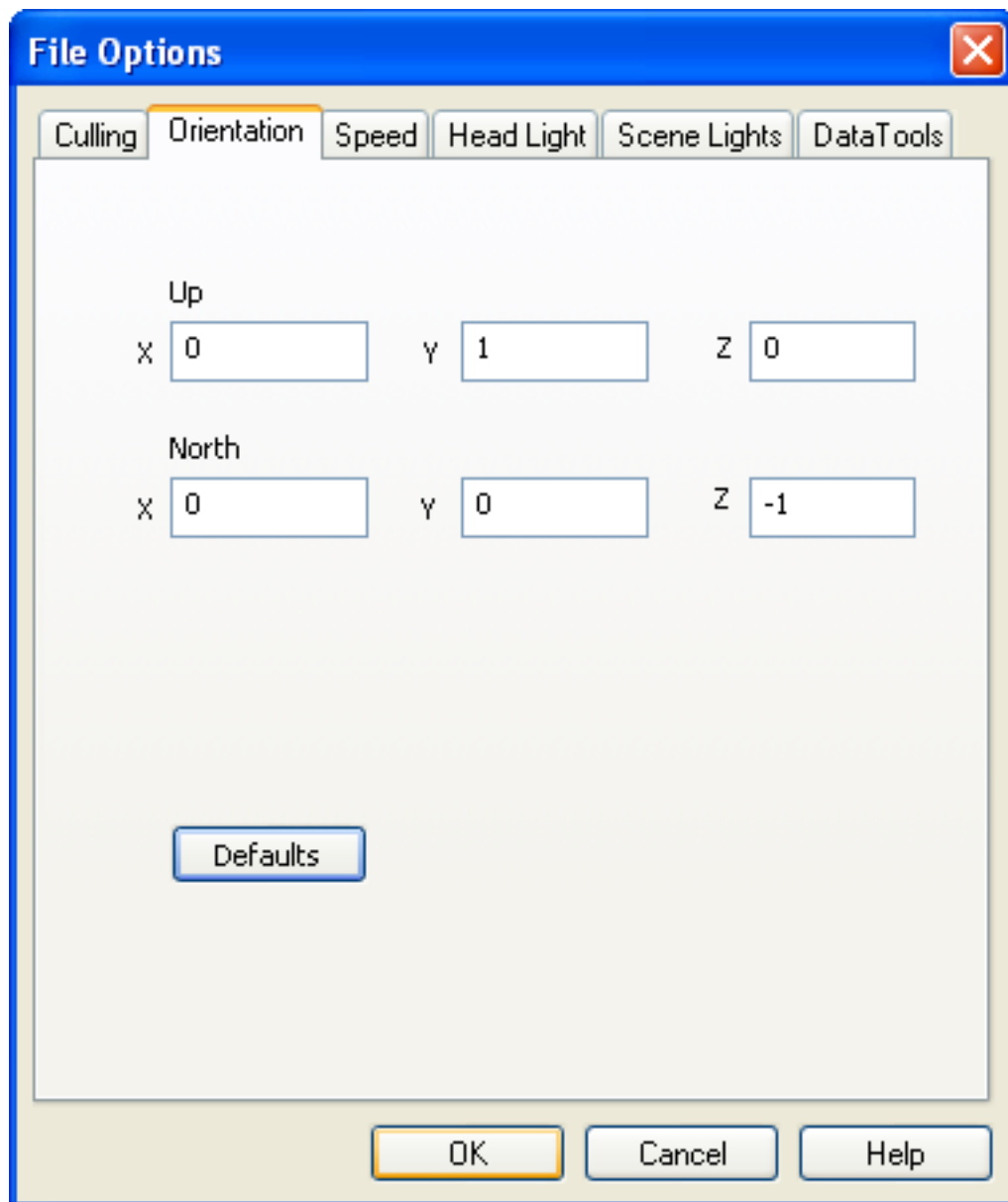
4. In the **Near Clip Plane** area, check the **Automatically generated** check box to tell NavisWorks to constrain the near plane to give the best view of the model it possibly can. Alternatively, uncheck this box to manually constrain the near clip plane. NavisWorks will put the near clip plane no further than the value you type into the **Furthest distance** box.
5. Similarly, in the **Far Clip Plane** area, select the **Automatically generated** check box to tell NavisWorks to constrain the far plane to give the best view of the model it possibly can. Alternatively, clear this check box to manually constrain the far clip plane. NavisWorks will put the far clip plane no closer than the value you type into the **Closest distance** box.
6. From the **Backface** drop-down list, select **On** to enable backface culling of all objects. Select **Solid** to cull the backface of solid objects only. This is the **default** option and that which you are most likely to require. If you find that parts of items are missing in the NavisWorks scene, you might want to disable this option, by selecting **Off**.
7. Click **OK** to set these options or **Cancel** to exit the dialog box without setting them.

Orientation Options

NavisWorks has a concept of orientation and provides a heads up directional display. For this to work effectively, it is essential that the current model is orientated correctly.

To orientate the model:

1. On the **Tools** menu, click **File Options**.
2. In the **File Options** dialog box, click the **Orientation** tab.



The defaults take the positive Z-axis as **Up** and the positive Y-axis as **North**.

3. If the models orientation is different to the defaults, enter XYZ values to correctly position the Up and North directions.
4. Click **OK** to accept your changes, or **Cancel** to return to NavisWorks without accepting them.

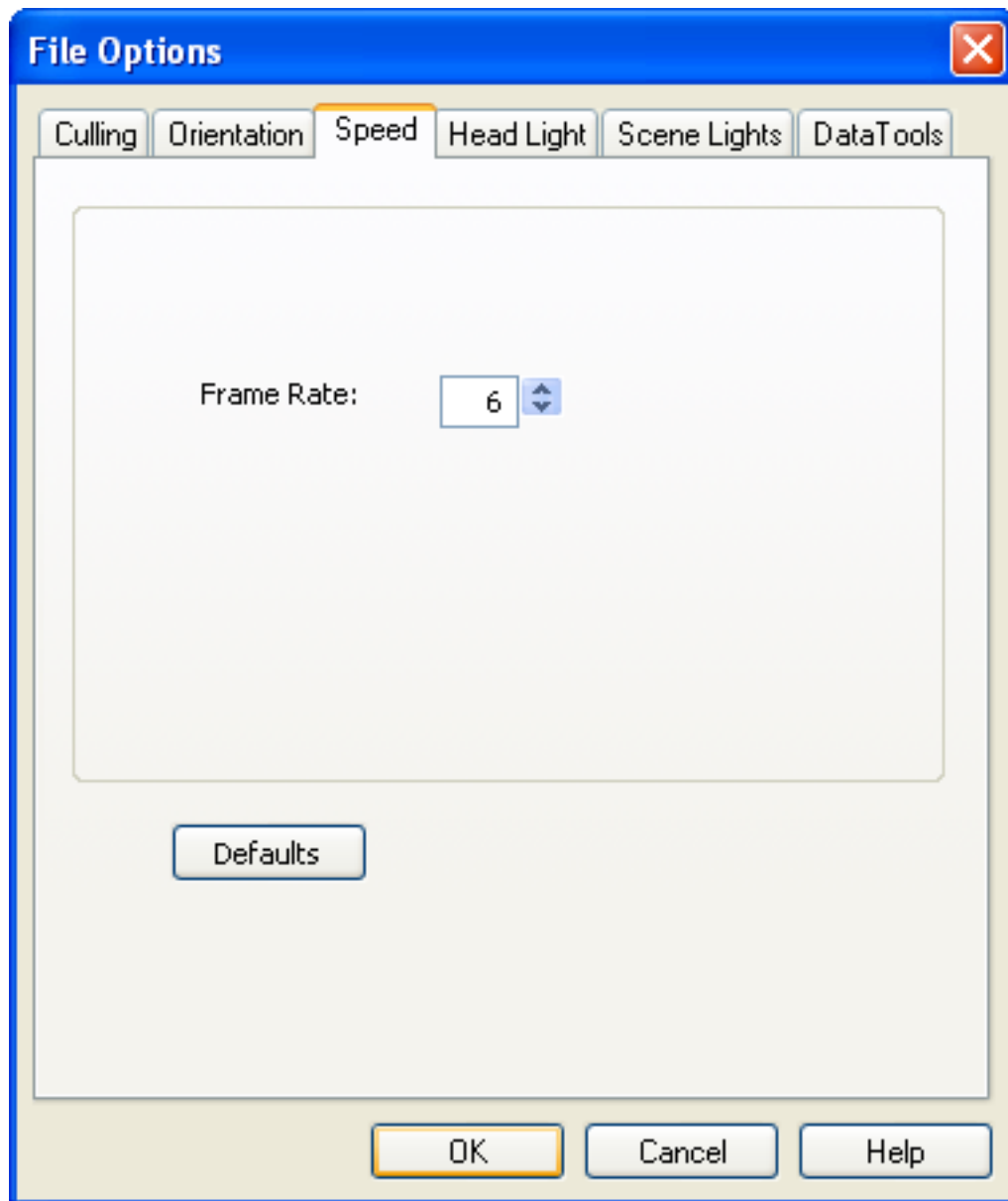
Speed Options

The basis of NavisWorks is its ability to walk through any size model in real time. NavisWorks guarantees a user-defined frame rate using a unique algorithm which automatically calculates which items to render first during navigation, based on the size of items and distance from the viewpoint. Items which

ks does not have time to render are therefore sacrificed or "dropped out" in the name of interactivity. These items are, of course, rendered when navigation ceases. The amount of drop-out depends on several factors including: hardware (in particular graphics card and driver performance), as well as the size of the NavisWorks navigation window and the size of the model. If you wish to reduce drop-out during navigation, you have the option to reduce frame rate and therefore trade it off against drop-out. You can set the frame rate anywhere between 1 and 60 frames per second.

Setting the frame rate:

1. On the **Tools** menu, click **File Options**.
2. In the **File Options** dialog box, click the **Speed** tab.



3. Select the number of frames per second to be applied to the rendered display of the model.
4. Click **OK** to set these options or **Cancel** to exit the dialog box without setting them.

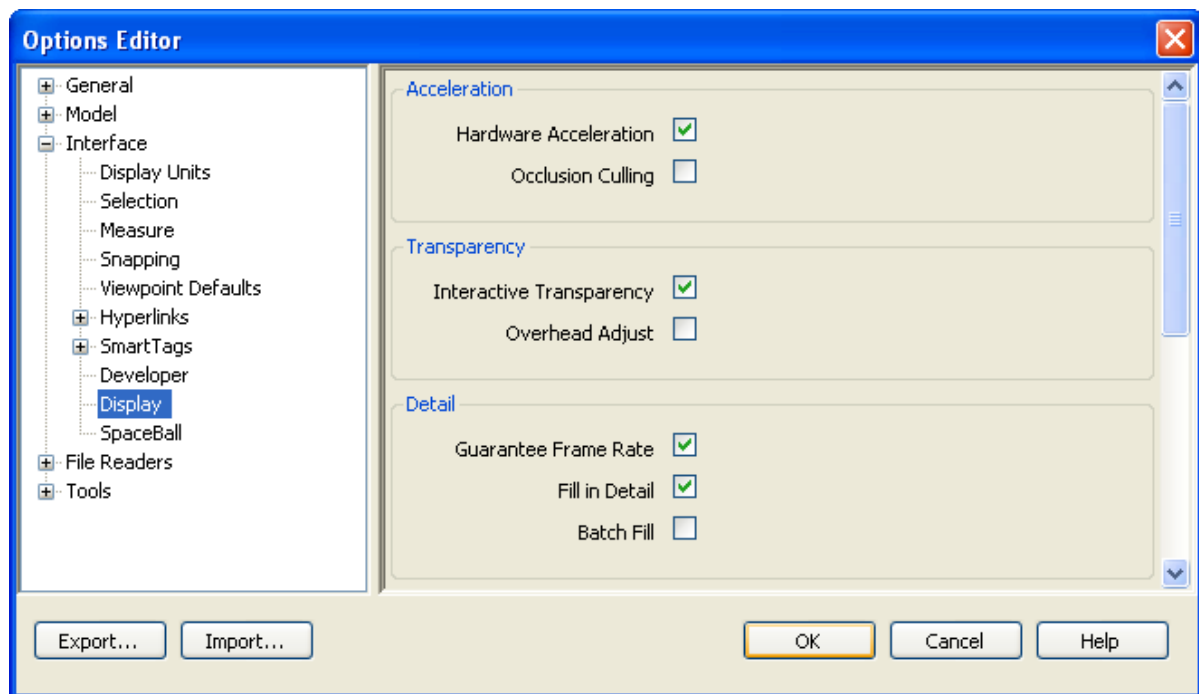
Display Options

Use these options to control several aspects of the NavisWorks main navigation window display to suite your preferences and setup.

Setting display options:

1. On the **Tools** menu, click **Global Options**.
2. Expand the **Interface** node, and click the **Display** option.

The Display page opens.



3. Select the **Hardware Acceleration** check box to allow NavisWorks to utilize any available OpenGL hardware acceleration on your video card. If your video card drivers do not function well with NavisWorks, then you may wish to disable this option. This option is grayed out if your video card does not support OpenGL hardware acceleration.
4. Select the **Occlusion Culling** check box to have NavisWorks only draw visible objects, i.e. ignores objects that are behind other objects. This option will improve the display performance when much of the model is not visible. For example, when you're walking down the corridor of a building. Occlusion culling can only be utilized on a machine with an OpenGL 1.5 compliant graphics card.
5. Select the **Interactive Transparency** check box to allow the rendering of transparent items during

interactive navigation. This may have an effect on performance - especially if your video card does not support hardware accelerated OpenGL - and so by default transparent items are only drawn when interaction has ceased.

6. Select the **Guarantee Frame Rate** check box to enable the NavisWorks engine to maintain the user defined frame rate set on the **Speed** tab of the **File Options** dialog box (see “[Speed Options](#)”). By default the target rate is maintained while moving. When movement stops the complete model is rendered. If the **Guarantee Frame Rate** check box is cleared, the complete model is always rendered during navigation, no matter how long it takes.
7. Select the **Fill In Detail** check box if you want NavisWorks to fill in any discarded detail when navigation has ceased.
8. Select the **Batch Fill** check box if you want NavisWorks to fill in detail in chunks rather than gradually. By default this is disabled as gradual rendering is generally better but some video cards may work better with batch fill enabled.
9. In the **Point Size** box, enter a number between 1 and 9 to set the size (in pixels) of points drawn in the main window. See “[Points](#)” for more information on points.
10. In the **Line Size** box, enter a number between 1 and 9 to set the width (in pixels) of lines drawn in the main window. See “[Lines](#)” for more information on lines.
11. In the **Snap Size** box, enter a number between 1 and 9 to set the size (in pixels) of snap points drawn in the main window. See “[Snap Points](#)” for more information on snap points.
12. Select the **Enable Parametric Primitives** check box to allow the dynamic rendering of parametric models during interactive navigation. When this check box is selected, the level of detail will be changed depending on the distance from the camera. When the check box is cleared, a default representation of the primitive is used, and the level of detail does not change. Modifying this option requires a restart of NavisWorks to take effect.
13. From the **Mode** drop-down list, select **XYZ** to turn on the XYZ indicator, or **Compass** to turn on the north-south indicator, or **Off** to display neither.
14. Select the **Show Position** check box to show the absolute X, Y, Z position of the camera (or the avatar's eye position if the avatar is visible). These position coordinates are shown at the bottom left of the main view, and can be shown with or without the other Heads Up elements.

Note:

See Orientation Options for more information on correctly orientating your model file.

15. Click **OK** to set these options or **Cancel** to exit the dialog box without setting them.

Performance Options

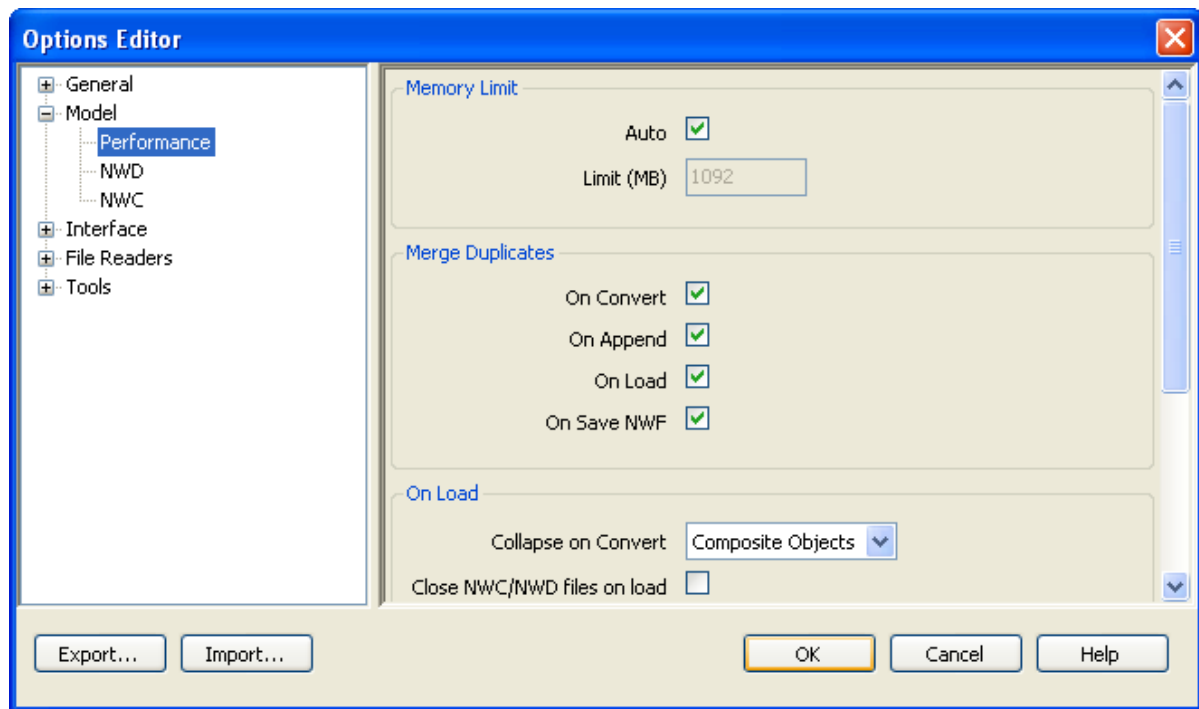
Use these options to customize the performance of NavisWorks.

Setting Performance options:

1. On the **Tools** menu, click **Global Options**.

- Expand the **Model** node, and click the **Performance** option.

The Performance page is displayed:



- Memory.** Select the **Auto** check box for NavisWorks to automatically calculate the maximum memory that may be used. This will take the lowest of your available physical memory or address space, less that required for your Windows operating system.

Alternatively, clear this option and manually enter the limit.

- Merge Duplicates.** These options improve performance by multiply instancing matching items. Rather than storing every item in memory, if any items are the same, NavisWorks can store one instance of them and 'copy' that instance into other positions. This is of particular benefit on larger models, where there are significant numbers of these duplicate geometries.

The options available determine when NavisWorks should perform this merging process:

- **On Convert.** Merge duplicates when converting a CAD file.
 - **On Append.** Merge duplicates when a new file is appended to the current scene.
 - **On Load.** Merge duplicates when loading a file into NavisWorks.
 - **On Save NWF.** Merge duplicates when saving the current scene out to .nwf.
- On Load.** The **Collapse on Convert** box can be set to alter layers shown in the Selection Set window on loading native CAD model files. Each type collapses the Selection Set tree up to the specified level. So **None** does not collapse the tree, **Composite Objects** collapses the tree up to the level of composite objects, etc. This enables performance to be prioritized over structure/properties and has the added benefit of improving streaming by cutting down the logical structure.

It should be noted that whilst NavisWorks will try to collapse items to the fewest number possible, it may be necessary to prevent collapsing in some cases to preserve model fidelity. For example if an item has properties or materials unique to itself, then collapsing would endanger this information, and therefore it will not be collapsed.

The **Close NWC/NWD files on load** check box, if selected, turns off any streaming on loaded NWC and NWD files, loading them into memory in their entirety, and then closing them. This allows other programs to write to these files whilst they are in use.

Select the **Create Parametric Primitives** check box to enable creation of parametric models (models described by formulae not vertices). Using this option allows you to get better looking visuals, faster rendering, smaller memory footprint (especially when loading DGN and RVM files that contain significant amounts of parametric data that will no longer need to be converted into vertices in NavisWorks. Modifying this option will take effect when you next load or refresh file.

6. **Temporary File Location.** Select the **Auto** check box for NavisWorks to automatically select your user Temp directory. Alternatively, if you prefer to select another location, clear this option and enter the path accordingly.

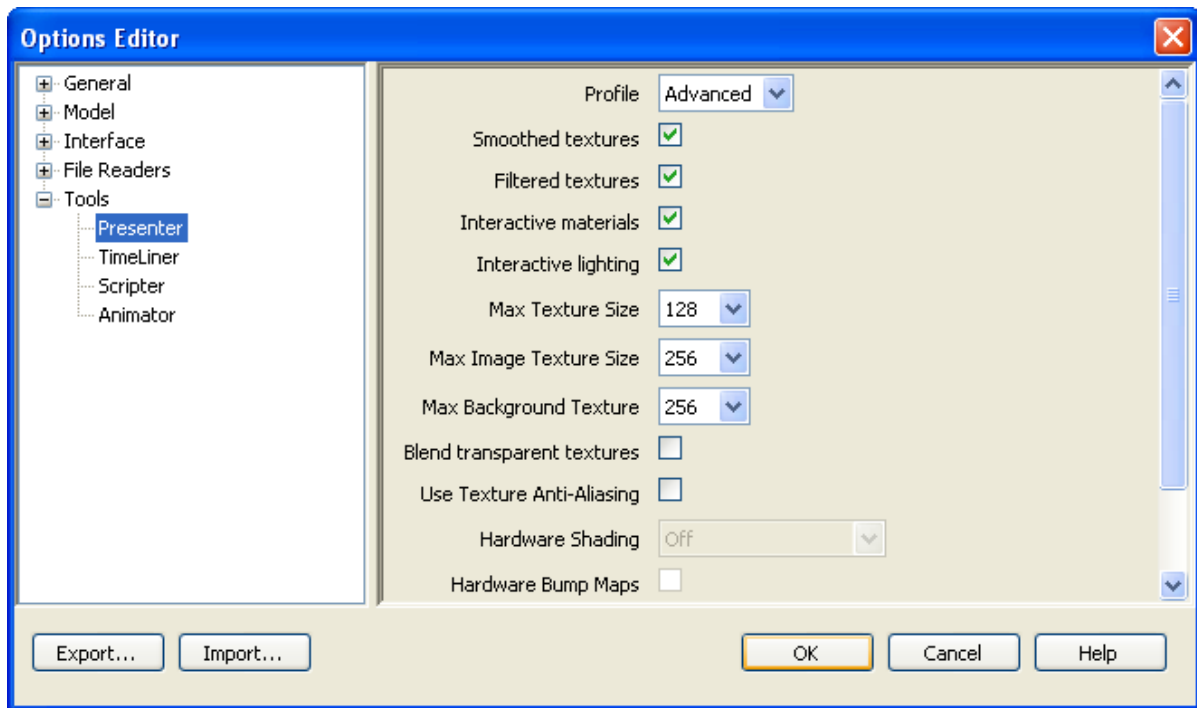
Presenter Options

Use these options to control the appearance of Presenter materials in the main navigation window during navigation. You may want to adjust these settings to get optimum performance from your graphics card when navigating around heavily textured scenes.

Setting Presenter options:

1. On the **Tools** menu, click **Global Options**.
2. Expand the **Tools** node, and click the **Presenter** option.

The **Presenter** page is displayed



3. Use the **Profile** drop-down list to adjust the Presenter to your level of knowledge. Select **Advanced** to use the advanced Presenter features (e.g., extra materials, lights, render styles and so on). By default, the Basic profile is used.
4. Select the **Smoothed Textures** check box if you want textures to look smooth but take longer to render. Clear it if you want textures to appear pixelated but render faster.
5. Select the **Filtered Textures** check box if you want to turn on mipmapping. This will improve the appearance of textures in the distance.
6. Clear the **Interactive Materials** check box if you want to turn off texture display during navigation. The materials reappear automatically when navigation ceases, as long as the **Full Render** rendering style is on. Clearing this check box will ease the load on less capable graphics cards and give less drop out in heavily textured scenes.
7. Clear the **Interactive Lighting** check box if you want to turn off Presenter lights during navigation. The lights reappear automatically when navigation ceases, as long as the **Full Lights** lighting style is on. Clearing this option will ease the load on less capable graphics cards and give less drop out in heavily lit scenes.
8. Use the **Max Texture Size** drop-down list to set the maximum size that any texture can be (in pixels, e.g. 128 is 128 pixels x 128 pixels). The higher the value, the more MB in memory will be taken and thus performance could be affected on less capable graphics cards.
9. Use the **Max Image Texture Size** drop-down list to set the maximum size that any texture image can be (in pixels, e.g. 256 is 256 pixels x 256 pixels). The higher the value, the more MB in memory will be taken and thus performance could be affected on less capable graphics cards.
10. Similarly, use the **Max Background Texture** drop-down list to set the maximum size that the background texture can be (in pixels, e.g. 256 is 256 pixels x 256 pixels). The higher the value, the more MB in memory will be taken and thus performance could be affected on less capable graphics

cards.

11. Select the **Blend Transparent Textures** check box if you want better quality but slower rendering of transparent items in the main navigation window. With this option off, items with transparency of more than 50% are treated as completely transparent and not rendered at all.
12. Select the **Use Texture Anti-Aliasing** check box if you want procedural materials (such as some bricks and tiles - you can tell a procedural material in Presenter because it has a ball style preview icon) to be rendered using anti-aliasing. With this option on, it will take longer to open files containing procedural textures, but the quality will be better.
13. **Hardware Shading** can only be utilized on machines with OpenGL 1.5 compliant graphics cards.

From the **Hardware Shading** drop-down list, select:

- **Interactive Shadows.** Select this option to enable lights and shadows whilst navigating.
 - **Passive Shadows.** Select this option to disable lights and shadows whilst navigating, then turn them on when navigation ceases.
 - **Lighting.** Select this option to turn lighting on with no shadows.
 - **Off.** Select this option to have no hardware shading enabled.
14. Select **Hardware Bump Maps** check box to display bump map textures interactively, whilst navigating. This can only be utilized on a machine with an OpenGL 1.5 compliant graphics card. Hardware Shading also needs to be enabled.
 15. Select **Hardware Marble** check box to display hardware rendered marble materials in realtime. This can only be utilized on a machine with an OpenGL 1.5 compliant graphics card. Hardware Shading also needs to be enabled.
 16. Click **OK** to set the options or **Cancel** to exit the dialog box without setting them.

Chapter 17. Viewpoints

Viewpoints are an important feature of NavisWorks. They not only allow you to save and return to views of the model which are of importance, but they can also be used for design review audit trails and for setting up animations of the model.

Saving Viewpoints

Viewpoints contain more than just the camera information - each viewpoint can also contain redlines and comments. In fact, you can use viewpoints as a design review audit trail. They can be used as hyperlinks in the main navigation window to click on and zoom to the viewpoint, which will also bring up the redline and comments associated with it. The viewpoints, redlines and comments are all saved into an .nwf file from NavisWorks, so even if the native CAD files are changing, the saved viewpoints remain the same over the top, so you can see how the design has evolved. See [Chapter 20, Reviewing](#) for more information on hyperlinks, comments and redlines and [“NWF Files”](#) for more information on the .nwf file format.

Viewpoints also retain the section planes active at the time of viewpoint creation, which can be useful in animating sliding sections. See [“Sectioning a model”](#) for more information on sections. Viewpoints can optionally retain saved attributes too, so that on returning to a viewpoint, overridden colors, transparencies and hidden items are reinstated. This can be used to great effect to create animations where items appear and disappear from the scene in time. See [“Viewpoints Options”](#) for more information on options, and [Chapter 19, Animation](#) for more information on animations.

To save a viewpoint:

- On the **Viewpoint** menu, click **Saved Viewpoints > Save Viewpoint**.

or

- Right-click the **Viewpoints** control bar and choose **Save Viewpoint**.

New viewpoints are named "ViewX" where 'X' is the next available number added to the list. This new viewpoint will take all the attributes of the current viewpoint in the main navigation window.

Recalling Viewpoints

To return to a viewpoint

- Click **Viewpoint > Saved Viewpoints**, and choose the saved viewpoint from the list.

or

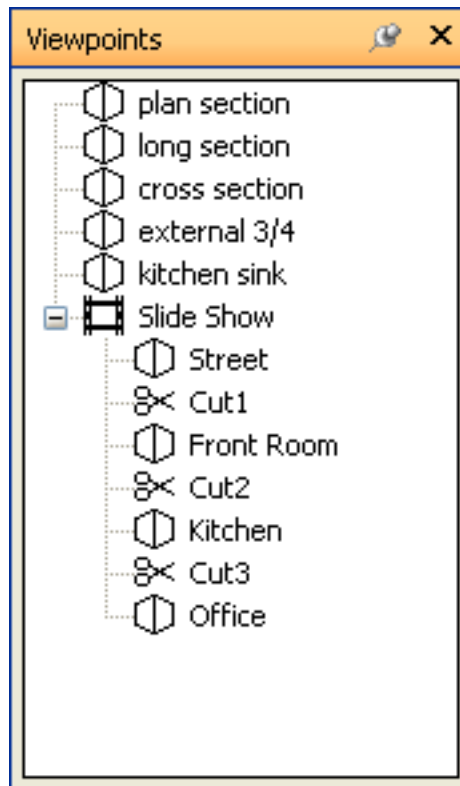
- In the **Viewpoints** control bar, simply click on the viewpoint from the list.

Note:

On recalling viewpoints the navigation mode that was active when the viewpoint was created will be re-selected. Any redlines and comments associated with the viewpoint will also be reinstated.

The Viewpoints Control Bar

Viewpoints allow you to keep a record of all the different views of a model so that you can jump to preset viewpoints without having to navigate each time to reach an item. Viewpoint animations are also saved with the viewpoints, as they are simply a list of viewpoints treated as keyframes. In fact, viewpoint animations can be made by simply dragging preset viewpoints onto an empty viewpoint animation. See “[Creating Viewpoint Animations](#)” for more information on viewpoint animations. You can also organize your viewpoints and viewpoint animations using folders.



The **Viewpoints** control bar is shown above. To open it,

- On the **View** menu, click **Control Bars > Viewpoints**

or

- Click **Viewpoints**  on the **Workspace** toolbar.

Icons are used to represent different elements:



represents a folder which may contain all other elements (including other folders).



represents a viewpoint saved in orthographic mode.



represents a viewpoint saved in perspective mode.



represents a viewpoint animation clip.



represents a cut inserted into a viewpoint animation clip.

You can select more than one viewpoint by either holding down the **Control** key and left-clicking, or by left-clicking on the first item, and then clicking on the last item while holding down the **Shift** key. You can drag viewpoints around the **Viewpoints** control bar, and reorganize into folders or animations.

There are no buttons on this control bar, and commands are actioned through context menus. Through these menus, you can save and update viewpoints, create and manage viewpoint animations and create folders to organize these viewpoints and viewpoint animations. You can also drag and drop viewpoints or viewpoint animations onto viewpoint animations or folders, and holding down the **Control** key during this operation will copy the element being dragged. This allows fairly complex hierarchies of viewpoint animations and folders to be easily composed.

Viewpoints, folders and viewpoint animations can all be renamed by slow clicking (clicking and pausing without moving the mouse) on the element, or clicking on it and hitting **F2**. Right-clicking on an element in the **Viewpoints** control bar gives you a different shortcut menu, depending on the element, or if you've right-clicked a blank space. The following section explains the different shortcut menus.

The Viewpoint Shortcut Menus

You get a different shortcut menu, depending on what element you right-click on in the **Viewpoints** control bar:

- Blank space
- A saved viewpoint
- A viewpoint animation
- A folder

All shortcut menus share the **Sort** option, which sorts the contents of the **Viewpoints** control bar alphabetically, including folders and their contents.

The Viewpoints Control Bar Shortcut Menu

Saving viewpoints, adding viewpoint animations and folders

1. Right-click a blank space in the **Viewpoints** control bar.
2. Choose **Add Folder** if you want to add another folder. A new folder will be created with its default name ("FolderX") editable.

Choose **Save Viewpoint** if you want to save the current viewpoint. A new viewpoint will be created with its default name ("ViewX") editable.

Choose **Add Empty Animation** if you want to create a new viewpoint animation, ready for dragging viewpoints onto. A new viewpoint animation will be created with its default name ("AnimationX") editable. See “ [Creating Viewpoint Animations](#) ” for more information on viewpoint animations.

Viewpoints

Managing Viewpoints

1. Right-click the viewpoint in the **Viewpoints** control bar.
2. Choose **Edit** to manually edit the viewpoint's attributes (see “ [Editing Viewpoints](#) ”).

Choose **Add Copy** to create a copy of the viewpoint in the saved viewpoints list. The copy will be named the same as the viewpoint clicked on, but with a "- copy" suffix. The main navigation window will jump to this viewpoint.

Choose **Add Comment** to add a comment regarding this viewpoint. See “ [Commenting](#) ” for more information on comments.

Choose **Update** to make the saved viewpoint the same as the current viewpoint.

Choose **Delete** to remove the viewpoint from the list of saved viewpoints.

Viewpoint Animations

Managing Viewpoint Animations

1. Right-click the viewpoint animation, or any of its keyframes, in the **Viewpoints** control bar.
2. Choose **Save Viewpoint** to add the current viewpoint as the last keyframe in the selected viewpoint animation.

Choose **Add Cut** to add a cut to the end of the viewpoint animation. Cuts are pauses in the viewpoint animation and are 1 second long by default.

Choose **Add Copy** to add a copy of the element. If you've right-clicked a viewpoint animation, the whole animation will be copied and named the same but with a "- copy" suffix. If you've right-clicked a cut or a keyframe, then the cut or keyframe will be copied.

Choose **Add Comment** to add a comment regarding this viewpoint. See “ [Commenting](#) ” for more information on comments.

Choose **Edit** to edit the element. Editing a keyframe will open the Edit Viewpoint dialog box. See “ [Editing Viewpoint Animations](#) ” for more information on editing viewpoint animations, keyframes and

cuts.

Choose **Update** to update all keyframes in the viewpoint animation with the current render style, lighting and navigation mode. Choosing **Update** on a single keyframe will only update that frame with the current modes.

Choose **Delete** to remove the viewpoint animation from the list of saved viewpoints, or in the case of a keyframe or cut, to remove the keyframe or cut from the viewpoint animation.

If you've right clicked on a keyframe, you can also choose **Update** to make the keyframe the same as the current viewpoint.

Folders

Managing Folders

1. Right-click the folder in the **Viewpoints** control bar.
2. Choose **Save Viewpoint** if you want to save the current viewpoint. A new viewpoint will be created in the folder with its default name ("ViewX") editable.

Choose **Add Animation** if you want to create a new viewpoint animation, ready for dragging viewpoints onto, in this folder. A new viewpoint animation will be created with its default name ("AnimationX") editable. See "[Creating Viewpoint Animations](#)" for more information on viewpoint animations.

Choose **Add Copy** to create a copy of the folder in the saved viewpoints list. The copy will be named the same as the folder clicked on, but with a " - copy" suffix.

Choose **Add Folder** if you want to add another folder underneath the selected folder. A new folder will be created with its default name ("FolderX") editable.

Choose **Add Comment** to add a comment regarding this folder. See "[Commenting](#)" for more information on comments.

Choose **Update** to update all viewpoints in the folder with the current render style, lighting and navigation mode. Choosing **Update** on a single viewpoint will only update that viewpoint with the current modes.

Choose **Delete** to remove the folder and all its contents from the list of saved viewpoints.

Editing Viewpoints

You can edit by hand any viewpoints attributes, including camera position, field of view, speed of motion and saved attributes. All entries are measured in scene units (see "[Units](#)").

If accessed from **Viewpoint > Edit Current Viewpoint**, the **Edit Viewpoint** dialog box allows editing of the current viewpoint's attributes. Alternatively, if accessed via the saved viewpoints list by right-clicking on a viewpoint or a keyframe and choosing edit, this dialog allows editing of the currently selected viewpoint's or keyframe's attributes as outlined below:

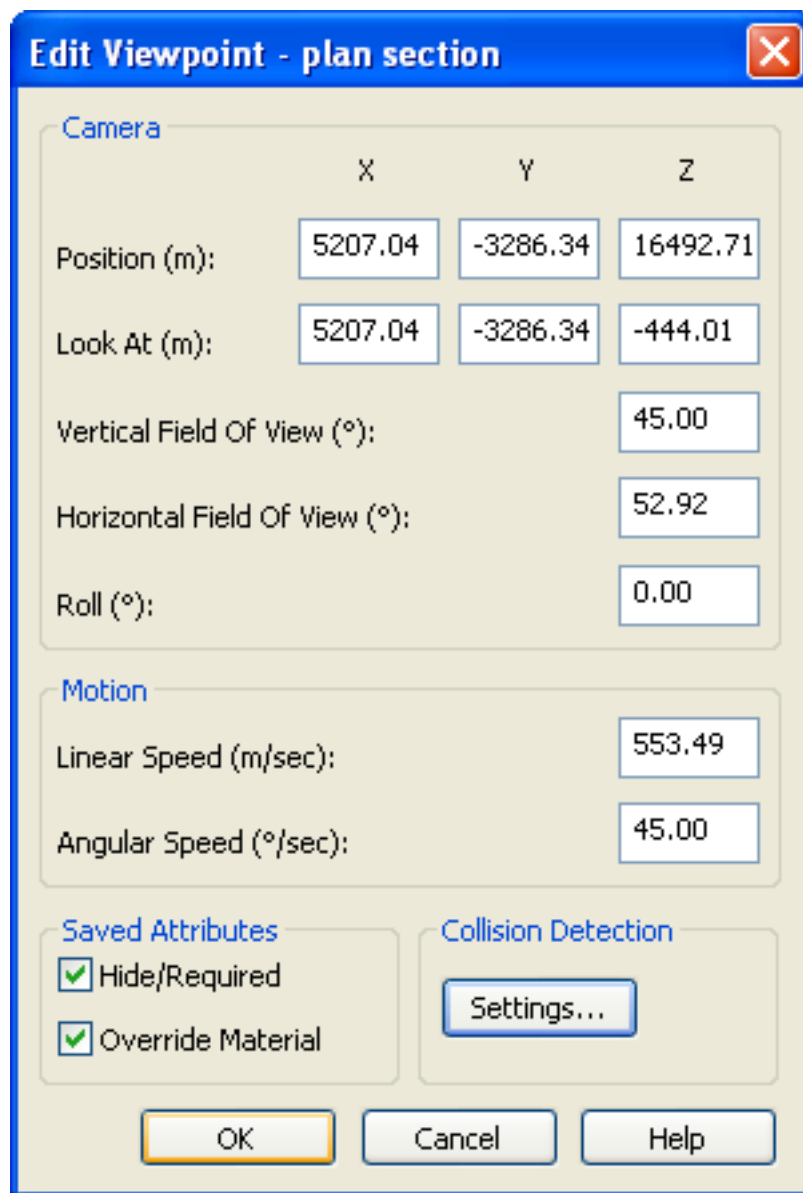
Editing a viewpoint

1. To edit a saved viewpoint, right-click the viewpoint on the **Viewpoints** control bar and choose **Edit** from the shortcut menu.

Alternatively, to edit the current main navigation viewpoint, go to **Viewpoint > Edit Current Viewpoint**.

Or to edit a thumbnail's viewpoint, right-click on the thumbnail and choose **Edit Viewpoint** from the shortcut menu.

The **Edit Viewpoint** dialog box is displayed.



The dialog box is titled "Edit Viewpoint - plan section" and features a red close button in the top right corner. It is organized into several sections:

- Camera**: This section contains a table for position and look-at coordinates, and three input fields for field of view and roll.

	X	Y	Z
Position (m):	5207.04	-3286.34	16492.71
Look At (m):	5207.04	-3286.34	-444.01

Vertical Field Of View (°): 45.00

Horizontal Field Of View (°): 52.92

Roll (°): 0.00
- Motion**: This section contains two input fields for speed.

Linear Speed (m/sec): 553.49

Angular Speed (°/sec): 45.00
- Saved Attributes**: This section contains two checked checkboxes.

☒ Hide/Required

☒ Override Material
- Collision Detection**: This section contains a "Settings..." button.

At the bottom of the dialog are three buttons: "OK", "Cancel", and "Help".

2. Set the camera position's x-, y- and z- coordinates using the **Position** boxes.
3. Set the focal point's x-, y- and z- coordinates of the camera using the **Look At** boxes.
4. Enter the **Vertical Field Of View** and **Horizontal Field Of View**. If the units are set to degrees, then these numbers should be between 0.1 and 90 and if in radians, between 0.002 and 3.124. See [Field Of View](#) for more details on what field of view means.
5. Enter the **Roll** of the camera about its viewing axis. This value is not editable where the world up vector stays upright (i.e. in walk, orbit and turntable modes).
6. Enter the speed of motion in a straight line for the viewpoint in the **Linear Speed** box (the minimum value is 0 and the maximum is based on the size of the scene's bounding box).
7. Enter the speed of turning for the viewpoint in the **Angular Speed** box.
8. If the viewpoint being edited is a saved viewpoint (i.e., selected from the **Viewpoint** control bar), selecting the check box of a saved attribute will store that attribute with the viewpoint. See "[Viewpoints Options](#)" for more details.
9. Click the **Settings** button to open the **Collision Detection** dialog box:

Collision Detection

☒ Collision Detection
☐ Gravity
☐ Auto Crouch

Viewer

Radius (m) 0.25
Height (m) 1.70
Eye Offset (m) 0.15

Third Person

☒ Enable
☒ Auto Zoom

Avatar Human 1
Angle (°) 15.00
Distance (m) 4.00

Defaults OK Cancel

- Select the **Collision Detection** check box to activate collision detection.
- Select the **Gravity** check box to activate gravity.
- Select the **Auto Crouch** check box to activate crouching.
- In the **Viewer, Radius** text box, enter a value for the radius of the collision volume. See “ [Collision Detection](#) ”.
- In the **Viewer, Height** text box, enter a value for the height of the collision volume. See “ [Collision Detection](#) ”.
- In the **Viewer, Eye Offset** text box, enter a value for the distance below the top of the collision volume, where the camera will focus upon when **auto zoom** is activated.
- Select the **Third Person, Enable** check box to view from a third person perspective.
- Select the **Auto Zoom** check box to automatically zoom from third person view into first person view, whenever the line of vision is obscured by an item in the model scene.
- From the **Third Person, Avatar** drop-down, select the avatar you wish to represent yourself as. See “ [Third Person View](#) ”.
- In the **Third Person, Angle** text box, enter the angle at which you wish to look at the avatar. For example, zero degrees will be directly behind and 15 degrees will be looking down on the avatar at a 15 degree angle.
- In the **Third Person, Distance** text box, enter the distance behind the avatar, from which you wish to view from.
- Click **OK** to accept the settings, or **Cancel** to return to the **Edit Viewpoint** dialog without changing the settings.

10. Click **OK** to set the viewpoint or **Cancel** to exit the dialog without setting it.

Viewpoints Options

Two view attributes can be saved with a viewpoint:

- Hide/Required - whether items are hidden or required.
- Override Materials - the color and transparency of items.

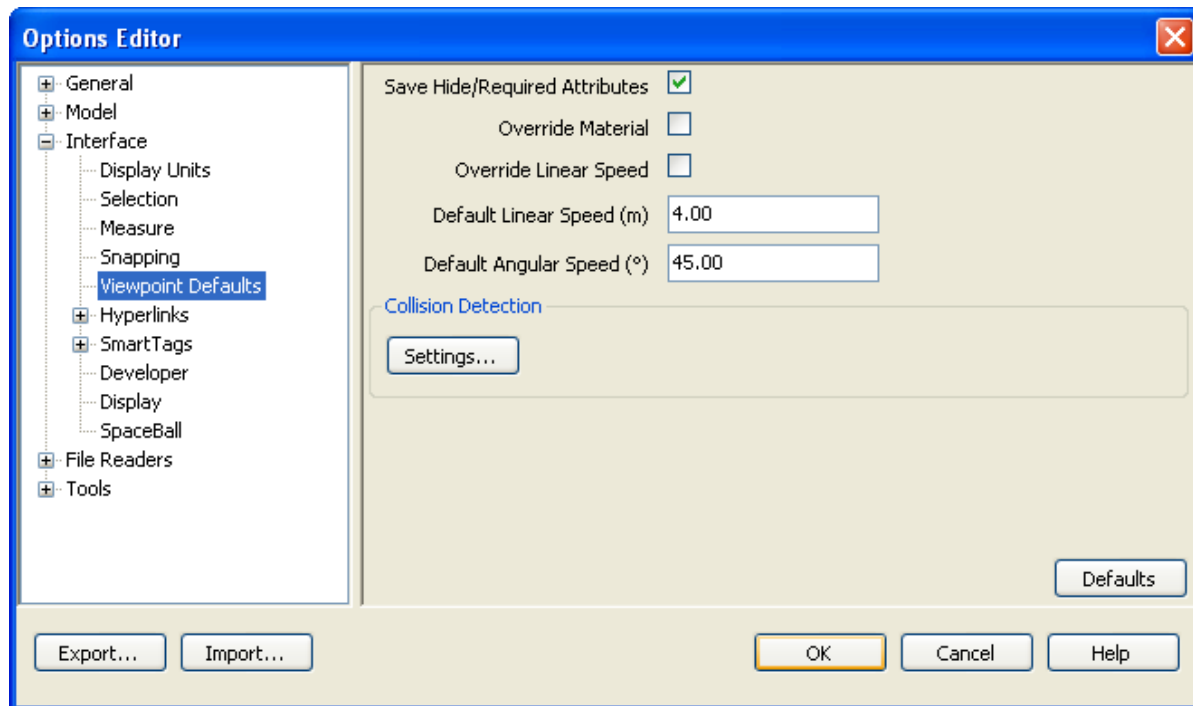
You can set a viewpoint to save either attribute by editing the viewpoint. To update changes to overridden material or hide/required, use **Update** on the viewpoints shortcut menu. Be careful, though, as this also updates the point of view as well, which may disrupt any redline information stored with the viewpoint.

By default these attributes are not stored with new saved viewpoints. If you do wish them to be saved by default, then this can be set in the **Options Editor**.

Setting the default viewpoints options:

1. On the **Tools** menu, click **Global Options**.
2. Expand the **Interface** node, and click the **Viewpoint Defaults** option.

The Viewpoints page opens.



3. Select the **Save Hide/Required Attributes** check box if you want to save the hidden and required items with the viewpoints you save. This means that when returning to those viewpoints, the items that were hidden when the viewpoint was saved will be hidden again and those that were drawn will be drawn again. By default, this check box is clear, as it requires a relatively large amount of memory to save this state information with each viewpoint. See [“Hiding Items”](#) for more information on hidden items and [“Making items required”](#) for more information on making items required.
4. Select the **Override Material** check box if you want to save the material overrides with the viewpoints you save. This means that when returning to those viewpoints, the material overrides set when the viewpoint was saved will be reinstated. By default, this check box is clear as it requires a relatively large amount of memory to save this state information with each viewpoint. See [“Overriding Item Properties”](#) for more information on overriding materials.
5. Select the **Override Model Linear Speed** check box to be able to set a specific speed to navigate on loading a model. Without this selected, the linear navigation speed is directly related to the size of the model loaded.
6. The **Default Angular Speed** can be set to any number of degrees per second. This affects the speed at which the camera turns.
7. Click **OK** to set the profile or **Cancel** to exit the dialog without setting it.

Collision detection settings can also be saved with a viewpoint, including whether collision detection, gravity, crouching and third person view are enabled.

You can set a viewpoint to save any of these settings by editing the viewpoint, in the same way as the view attributes, above.

By default, all of the collision detection settings are disabled. If you wish to save your preferred collision detection setting defaults, which will be used each time you open a model or a new NavisWorks session, then these can be set in the **Options Editor**.

Setting the default collision detection options:

1. On the **Tools** menu, click **Global Options**.
2. Expand the **Interface** node, and click the **Viewpoint Defaults** option.
3. Click the **Settings** button on the Viewpoints page.

The **Default Collision Detection** dialog box opens.

Default Collision Detection

☒ Collision Detection
☐ Gravity
☐ Auto Crouch

Viewer

Radius (m) 0.25
Height (m) 1.70
Eye Offset (m) 0.15

Third Person

☒ Enable
☒ Auto Zoom

Avatar Human 1
Angle (°) 15.00
Distance (m) 4.00

Defaults OK Cancel

4. Select the default options you wish NavisWorks to initialize with. See **Editing Viewpoints** for a description of each of the available options.

Note:

These **default** collision detection settings differ from the **current viewpoint** settings, in that these do not alter the current scene. These settings will only be used when starting NavisWorks, or opening a new model. To edit the collision detection settings in the current scene, see “[Editing Viewpoints](#)”.

Chapter 18. Sectioning

Sectioning allows you to make up to 6 sectional cuts in any plane while still being able to navigate around the scene, enabling you to see inside models without hiding any item. Section planes are stored inside viewpoints and so can also be used within viewpoint animations and object animations to show a dynamically sectioned model. See “[The Viewpoints Control Bar](#)” for more information on viewpoints, and [Chapter 19, Animation](#) for more information on animations.

Slices can also be created using two opposing section planes and linking them. In this way you can move a slice through the scene in real time and can again link this to viewpoint animations, object animations, and viewpoints.

Sectioning a model

There are up to 6 section planes enabled at one time, but there is only one that is active. The section plane that is active is numbered in the drop-down box. However, you can link section planes together to form slices.




The **Sectioning** toolbar is shown above. To open it,

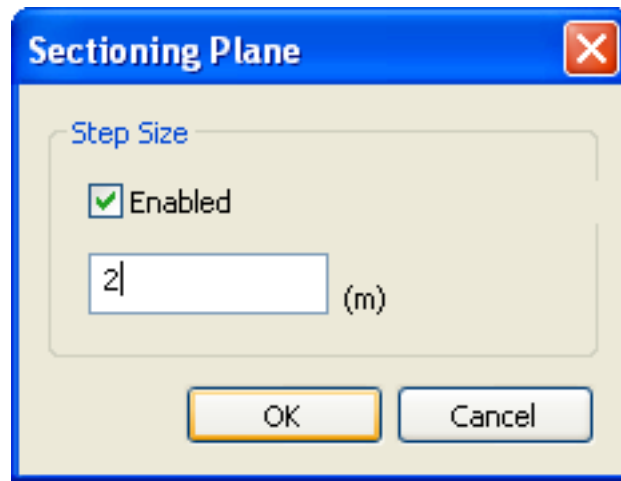
- Right-click anywhere in the toolbar area of the screen, and click **Sectioning** on the shortcut menu.

or

- Click **Sectioning**  on the **Workspace** toolbar.









Manipulating the active section plane:

1. Choose the plane that you wish to manipulate using the numbered drop-down box. In this drop-down box, there will always be one more than the number of enabled section planes in the scene, up to a maximum of 6.
2. Set the **Step Size** by clicking **Step Size** . This opens the **Sectioning Plane** dialog box.



Select the **Step Size** check box, and enter the step value in the box below. This value is then used when moving the section planes. If the **Step Size** check box is left clear, the section planes will move at percentage intervals.

Click **OK** to close the dialog box, and save the changes.

3. To switch the plane on, click **Enable/Disable**  on the **Sectioning** toolbar. Clicking it again, switches the plane off.
4. Once the plane is switched on, choose one of the 7 planes that this section plane will cut:
 - Align View**  - aligns section plane with camera view plane.
 - Align Bottom**  - aligns section plane with bottom of model.
 - Align Top**  - aligns section plane with top of model.
 - Align Front**  - aligns section plane with front of model.
 - Align Back**  - aligns section plane with back of model.
 - Align Left**  - aligns section plane with left of model.
 - Align Right**  - aligns section plane with right of model.

Note:


Each plane for each section remembers its position, so the slider will move when you choose

another plane.


5. Move the slider to interactively position the section plane to the required location. The number in the edit box shows the position of the section plane from the origin and will be updated when moving the section plane. You can also type in the location of the origin in this edit box for exact positioning of the plane.

Note:

You can also use the cursor keys and mouse wheel for simple sliding of the section plane through the model.

6. Clicking the **Set Range**  button helps you to set a finer resolution for sectioning large models.

What this button does is limit the range of the section planes to the bounding box limits of the currently selected items. For more information on selecting items, see [Chapter 13, Selecting Items](#). Clicking this button with nothing selected resets the section range to the limits of the whole model, which is the default.

7. If you have more than one section plane enabled, you can delete the currently active plane using the delete  button. The next enabled plane will then become the active plane.


Linking Sections


You can add up to 6 section planes to the scene at once using the sectioning procedure. Once more than one plane is enabled, you can then link them together. Linking opposing planes, such as top and bottom, enables you to quickly 'slice' your model in real time. The slices can be used in viewpoints, viewpoint animations, and object animations. The procedure below is an example of creating a horizontal slice using the top and bottom section planes.


To slice the model:

1. Set up the bottom section plane:

Select **1** in the drop-down list on the **Sectioning** toolbar.

Click  to enable the plane.


Click  to align the section plane with bottom of model.

Click  to set up the step size.

Use the slider bar to adjust the level of sectioning.


2. Set up the top section plane:

Select **2** in the drop-down list on the the **Sectioning** toolbar.

Repeat the steps for creating the bottom section plane, but this time, click  to align the section plane with top of model.

Note:

The model may disappear completely at this stage. If this happens, move the slider bar until it becomes apparent where the plane is.

3. If necessary, keep switching between planes 1 and 2 using the drop-down box, and configure the planes' position to how far you want them separated in the slice.
4. When happy with their separation, select section plane 2 and click the **Link**  button. This links planes 2 and 1 together to form a slice.
5. Use the slider bar to move the horizontal slice through the model.
6. If you want, you can save this slice configuration into a viewpoint. See “ [Saving Viewpoints](#) ” for more information on how to do this.

Thinking about linked sections and slices can be confusing. Just remember that when linking sections together, the section plane direction currently in operation effectively moves the whole "box" around the scene, keeping the other section planes relative to it.

Chapter 19. Animation

In NavisWorks there are two types of animation:

- Object animation
- Viewpoint animation

Viewpoint Animation

Viewpoint animation is a quick and efficient way of recording both your movement through the model and views of the model. There are two ways to produce a viewpoint animation in NavisWorks:

- By recording interactive navigation
- By creating animated transitions between saved views.

You can also create slide show animations, which are, essentially, viewpoint transitions with a number of cuts (pauses) added between viewpoints.

Object Animation

In addition to viewpoint animation, you can also animate and interact with 3D geometry in your model. Although the ability to record animations and produce scripts necessary to interact with animated objects is limited to users with access to the Animator and Scripter functionality, any user can actually play them back once they have been recorded.

The Animation Toolbar

The **Animation** toolbar in NavisWorks enables you to record, play and edit viewpoint animations. It can also be used to play back object animations and enable/disable scripting.


Note:


Creating object animations and scripts is limited to users with access to the Animator and Scripter functionality.


The **Animation** toolbar is shown below.





To open it, right-click anywhere in the toolbar area of the screen, and click **Animation** on the shortcut menu.


Rewind  - rewinds the animation back to the beginning.


Step Back  - steps back a single keyframe.


Reverse Play  - plays the animation backwards.


Record  - records the viewpoint animation.

Pause  - pauses the animation at the frame you press it at. You can then look around and wonder off in the model, or step forwards and backwards through the animation. To continue playing from where you paused, just press **Play** again.

Stop  - stops the animation playing and rewinds it back to the beginning.

Play  - plays the currently selected animation.


Step Forward  - steps one keyframe forwards.

Fast Forward  - fast forwards the animation to the end.


Animation Position slider  - controls the current playback position.

Animation Position - indicates the current playback position in seconds.

Available Animations  - allows you to choose the animation to play.

Toggle Scripts  - enables/disables animation scripts in your file.

The Viewpoints Control Bar

The viewpoint animations can be instantly recorded by pressing  on the **Animation** toolbar, and then navigating through the model. Alternatively, you can build viewpoint animations frame by frame (viewpoint by viewpoint) on the **Viewpoints** control bar, and then use it to save, edit, rearrange and manage your viewpoint animations in folders, including inserting cuts and dragging and dropping viewpoint animations onto other animations to build up a more complex viewpoint animation from simpler ones. At any time during an animation playback, you can stop the viewpoint animation and have a real time look around before restarting it. Once you are happy with the viewpoint animation, you can export it as an .avi file.




It is worth remembering that you can hide items in viewpoints, override colors and transparencies and set multiple section planes and these will all be respected by a viewpoint animation. This way you can easily create powerful viewpoint animations.

Creating Viewpoint Animations

There are two ways to create viewpoint animations in NavisWorks. You can either simply record your real-time walk through, or you can assemble specific viewpoints for NavisWorks to interpolate into a viewpoint animation later.

Viewpoint animation is controlled through the **Tools > Animation** menu, the Viewpoints control bar, and the Animation toolbar.

Creating a viewpoint animation in real time:

1. Click the **Record** button  on the **Animation** toolbar.
2. Navigate around in the main navigation window while NavisWorks records your movement. You can even move the section planes through the model during your navigation, and this will be recorded into the viewpoint animation too.
3. At any point during the navigation, you can click the **Pause** button . This will pause the recording while you maneuver into a new position. Click the **Pause** button again to continue recording the viewpoint animation. The resulting viewpoint animation will contain a cut for the duration of the pause.
4. When finished, click the **Stop** button .
5. A new viewpoint animation called "AnimationX", where 'X' is the latest available number, will be added to the **Viewpoints** control bar. The name will be editable at this point if you want to name it yourself. This viewpoint animation will also become the current active animation in the **Available Animations** drop-down box on the **Animation** toolbar.

While the above method is useful for creating quick viewpoint animations on the fly, sometimes you need more control over the viewpoint camera. To do this in NavisWorks, you need to set up several viewpoints and add them to an empty viewpoint animation. When playing back the animation, NavisWorks will then interpolate between these viewpoints.

Creating an animation frame by frame:

1. Right-click the **Viewpoints** control bar and select **Add Empty Animation** from the shortcut menu.
2. A new viewpoint animation called "AnimationX", where 'X' is the latest available number, will be added to the **Viewpoints** control bar. The name will be editable at this point if you want to name it yourself. There will be no plus sign next to the viewpoint animation, showing that the viewpoint animation is indeed empty.
3. Create the viewpoints where you want the camera to move through during the animation and save these into the **Viewpoints** control bar. These will become the frames for the animation. The more frames you have, the smoother and more predictable the viewpoint animation will be. See "[Saving Viewpoints](#)" for more information on creating viewpoints.

4. When you have all the viewpoints, simply drag them onto the empty viewpoint animation you just created. You can drag them on one-by-one, or select multiple viewpoints using the **Control** and **Shift** keys and drag several on at once. If you drop them onto the viewpoint animation icon itself, then the viewpoints will become frames at the end of the animation, but you can drop the viewpoints anywhere on the expanded animation to put them where you wish.
5. At this point, you can use the **Animation Position** slider on the **Animation** toolbar to move backward and forward through the viewpoint animation to see how it looks.
6. You can edit any of the viewpoints inside the viewpoint animation (see “[Editing Viewpoints](#)” for details on this), or you can add more viewpoints, delete them, move them around, add cuts and edit the animation itself (see “[Editing Viewpoint Animations](#)”) until you are happy with the viewpoint animation.
7. Once you have several viewpoint animations, you can drag and drop them onto a master viewpoint animation to compose more complex combinations of animations, just like dragging and dropping viewpoints onto an animation as a frame.

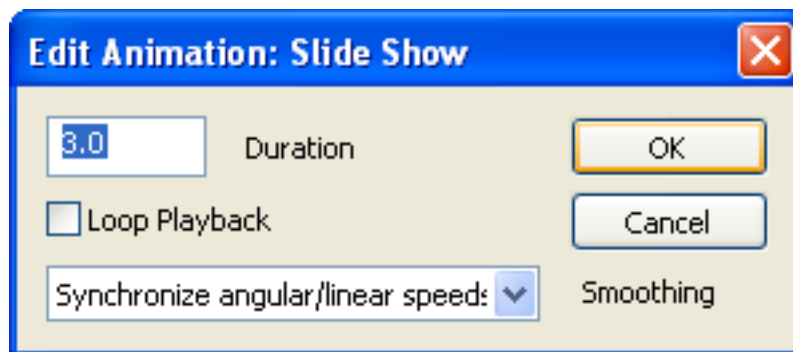
Editing Viewpoint Animations

Once a viewpoint animation is recorded, you can edit it to set the duration, the type of smoothing and whether it loops or not.

Editing a viewpoint animation:

1. Right-click the viewpoint animation you want to modify on the **Viewpoints** control bar, and click **Edit** on the shortcut menu.

The **Edit Animation** dialog is displayed.



2. Type in the duration in seconds in the **Duration** box.
3. If you want the viewpoint animation to play back continuously, select the **Loop Playback** check box.
4. From the **Smoothing** drop-down list, select the type of smoothing you want the viewpoint animation to use. **None** means that the camera will move from one frame to the next without any attempt at smoothing out the corners. The speed of movement between frames of an animation is dictated by the angular and linear speeds of the individual frames and so choosing **Synchronise angular/linear speeds** will smooth the differences between the speeds of each frame in the animation, resulting in a

less jerky animation.

5. Click **OK** to set these options, or **Cancel** to return to NavisWorks leaving the viewpoint animation as it was.

There is also nothing to stop you copying viewpoint animations (hold down the **Control** key when dragging an animation on the **Viewpoints** control bar), dragging frames off the animation into a blank space on the **Viewpoints** control bar to remove them from the viewpoint animation, editing individual frames attributes, inserting cuts or dragging other viewpoints or viewpoint animations onto the existing one, to continue developing your animations.

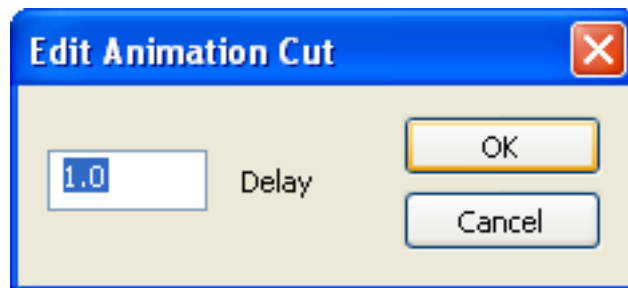
Animation Cuts

Cuts in a viewpoint animation are simply points where the camera pauses for a while. They are inserted automatically when you click on **Pause** during the interactive recording of a viewpoint animation, or you can insert them manually into an existing viewpoint animation.

Inserting pauses into a viewpoint animation:

1. Right-click the frame below where you want to insert the cut, and click **Add Cut** on the shortcut menu.
2. Type in the name of the cut, or hit **Enter** to accept the default name, which will be "CutX", where 'X' is the next available number.
3. This default duration of a cut is 1 second. To alter the duration of this pause, right-click the cut, and click **Edit** on the shortcut menu.

The **Edit Animation Cut** dialog is displayed



4. Type in the duration of the pause in seconds.
5. Click **OK** to set the duration or **Cancel** to return to NavisWorks without setting it.

Playing Back Animations


You can play back both pre-recorded object animation and viewpoint animation in the main navigation window. The animation plays in real time; this means that the NavisWorks engine is still attempting to maintain the guaranteed frame rate so some drop-out may still occur, just as in real-time navigation.

However, you can export the animations to an .avi file for playback with Windows Media Player™ and this will render each frame without any drop-out. Of course, you don't have the option of pausing the playback half way through to look around the mode using this method! See “ [Exporting an Animation](#) ” for details on how to export an animation to .avi.

Playing back an animation:

1. Select the animation you wish to play back from either the **Viewpoints** control bar, or from the **Available Animations** drop-down list on the **Animation** toolbar.
2. You can use the **Animation Position** slider to quickly move forwards and backwards through the animation. Full left is at the beginning and full right is at the end. The text box next to the slider shows the point in time (in seconds) through the animation that the camera is. You can type a number into this box to set the camera at a certain point in the animation and play back from that point.
3. For viewpoint animations, you may notice that the frame in the animation in the **Viewpoints** control bar is highlighted when the animation is playing. You can click on any frame to set the camera to that point in time in the viewpoint animation and continue playing back from there.
4. Use the VCR buttons on the Animation toolbar to step and play forwards and backwards through the animation.

Enabling Scripting:

- To enable animation scripts in your file, click the **Toggle Scripts**  button on the **Animation** toolbar.

You can now interact with your model. For example, if there is a script to open a door on pressing a specific key on the keyboard, pressing this key will open the door.

Chapter 20. Reviewing

NavisWorks offers several design review tools to help you review a model and communicate those reviews to others. Any reviewing you save in the model can also be saved into an .nwf file so that you can reload the reviews into a later session when the model has changed, or to pass onto colleagues to communicate design intent or problems.


The reviewing tools available in NavisWorks are:

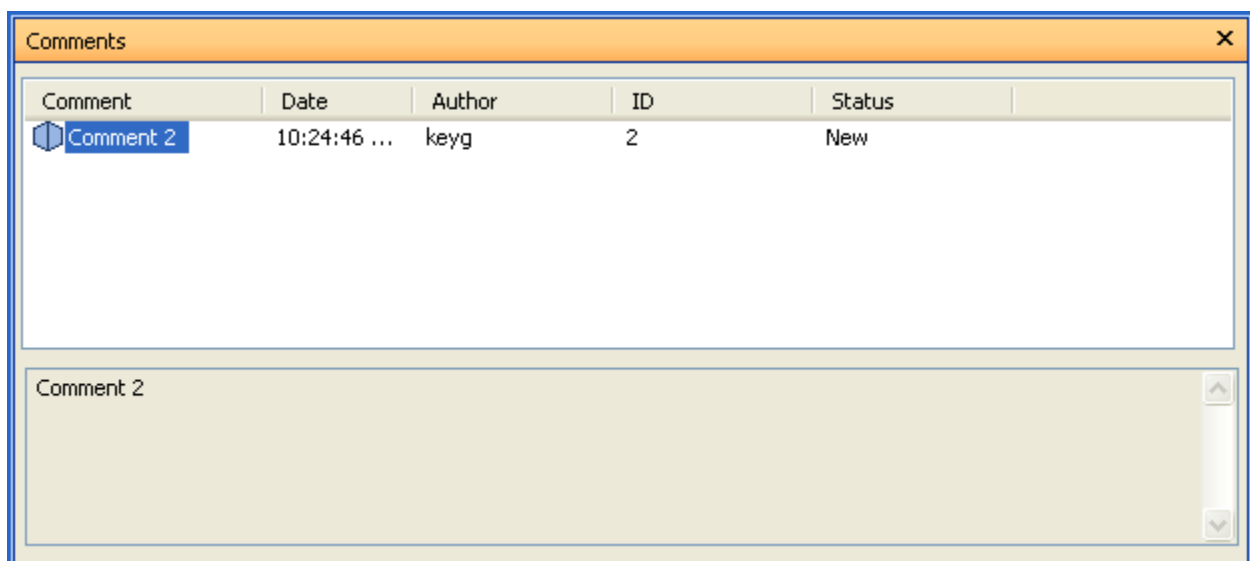
- Commenting
- Redlining (including tagging)
- Measuring
- Hyperlinks
- Smart Tags
- Collaboration
- SwitchBack

Commenting

Multiple comments can be attached to any item in the **Viewpoints** control bar (see “[The Viewpoints Control Bar](#)”), or to any item in the **Selection Sets** control bar (see “[Selection and Search Sets](#)”).

The **Comments** control bar allows you to view all comments attached to one of these sources.

To open it, click  on the **Workspace** toolbar, or on the **View** menu, click **Control Bars > Comments**.



When the source of the comments is recalled, such as a viewpoint, all comments attached to it appear in

the **Comments** control bar, showing the time and date, author, ID and status of each comment. The icon on the far left represents the source type:



- selection set.



- search set.



or



- viewpoint.



or



- viewpoint animation.



- tag.

With many comments attached to many sources in a model, you may want to find a particular comment without having to manually search each possible source. See “[Finding Comments](#)” for details on how to achieve this.

Note:

The first line of a comment is what is displayed in the top half of the **Comments** control bar and can be treated like its "subject". To get multiple lines in a comment, hold down **Control** and press **Enter**. This will give you a carriage return in the text box, rather than simulating a press of the **OK** button.


Any new comments will automatically be given a unique ID, along with the date and author of the comment and a status can be set. All of these are searchable criteria.

Once a comment is added, it can be edited or deleted.

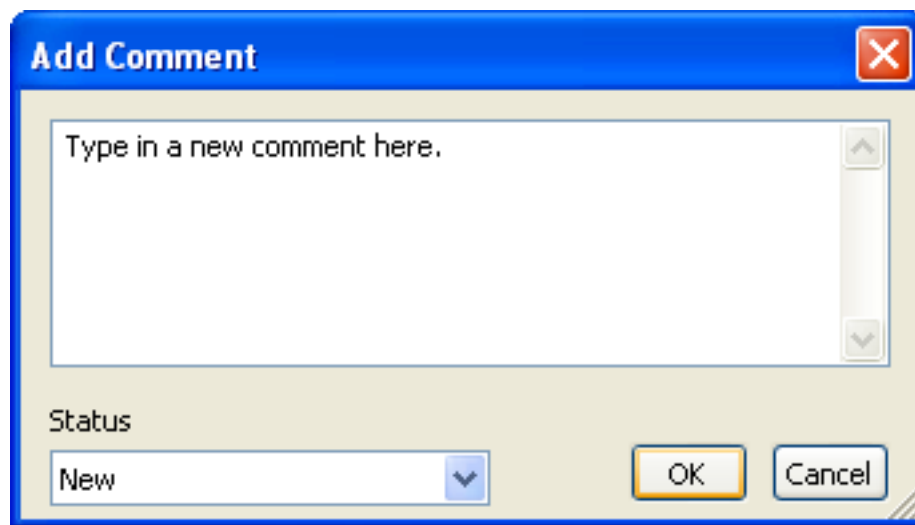
Adding Comments

You can add as many comments as you wish to a source, either from the **Comments** control bar, or from the source itself.

Adding a comment from the Comments control bar:

1. Go to the source of the comment, be it a viewpoint, selection set or Clash Detective result.
2. Open the **Comments** control bar by clicking  on the **Workspace** toolbar.
3. Right-click the **Comments** control bar, and click **Add Comment** on the shortcut menu.

An empty **Add Comment** resizable dialog is displayed.



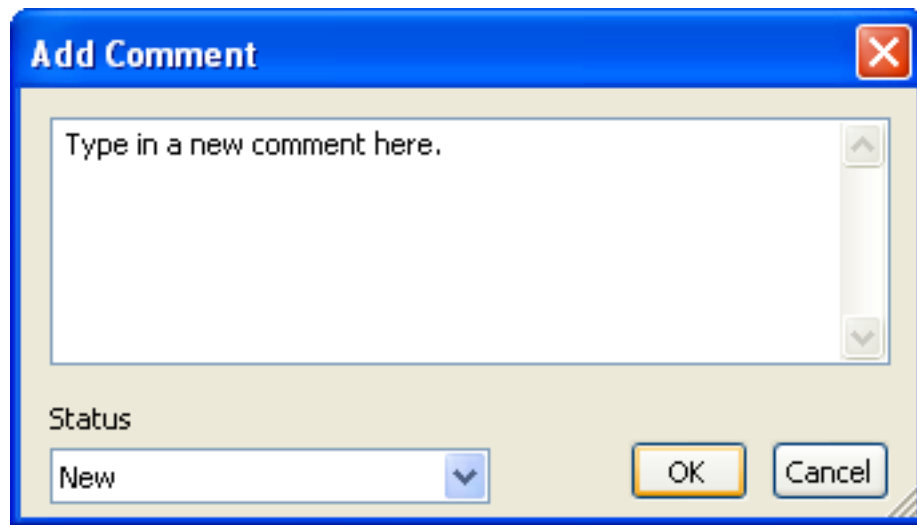
4. Type in the comment.
5. To assign a **status**, select either **New**, **Active**, **Approved** or **Resolved** from the drop-down list.
6. Click **OK** to save the comment or **Cancel** to return to NavisWorks without saving it.

Adding a comment from the source (viewpoint, selection set or Clash Detective result):

1. Go to the source of the comment, be it a viewpoint, selection set or Clash Detective result.
2. Right-click the source, and click **Add Comment** on the shortcut menu.

Alternatively, on the **Review** menu, click **Comments > Add Comment**.

An empty **Add Comment** resizable dialog is displayed.



3. Type in the comment.
4. To assign a **status**, select either **New**, **Active**, **Approved** or **Resolved** from the drop-down list.
5. Click **OK** to save the comment or **Cancel** to return to NavisWorks without saving it.

Editing Comments

Once a comment is saved, you can edit it either from the **Comments** control bar, or from the source itself. You can also renumber both tag and comment IDs.

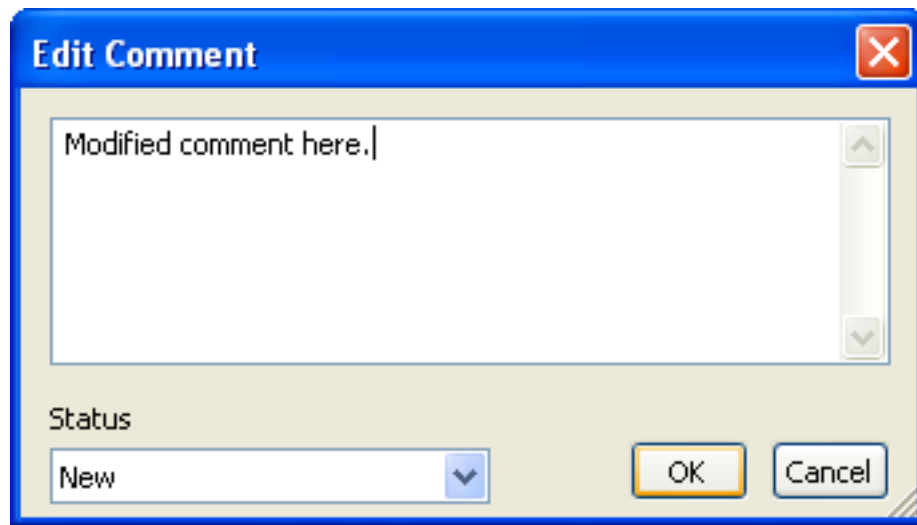
When adding a new tag or comment to a NavisWorks scene, it will automatically be assigned a unique ID. If however, you are Appending or Merging multiple NavisWorks files together, then there is the possibility for the same ID to be used more than once. In this situation, you may choose to renumber all of the IDs, making them unique to the scene, once again.

Editing a comment:

1. Go to the source of the comment, be it a viewpoint, selection set or Clash Detective result.
2. Open the **Comments** control bar by clicking  on the **Workspace** toolbar.
3. Right-click the comment, and click **Edit Comment** on the shortcut menu.

Alternatively, on the **Review** menu, click **Comments > Edit Comment**.

The **Edit Comment** resizable dialog is displayed.



4. Edit the comment and/or status accordingly.
5. Click **OK** to save the comment or **Cancel** to return to NavisWorks without saving it.

To renumber tag and comment IDs:

1. To renumber tag IDs, on the **Review** menu, click **Renumber Tag IDs**.

Note:

There may be a situation where two sessions are merged that contain identically numbered Tags and corresponding Tag Views. In this situation, **Renumber Tag IDs** will also attempt, wherever possible, to rename the associated Tag Views in line with the new tag numbers.

2. To renumber comment IDs, on the **Review** menu, click **Renumber Comment IDs**.

Deleting Comments

To delete a comment:

1. Go to the source of the comment, be it a viewpoint, selection set or Clash Detective result.
2. Open the **Comments** control bar by clicking  on the **Workspace** toolbar.
3. Right-click the comment, and click **Delete Comment** on the shortcut menu.

Alternatively, on the **Review** menu, click **Comments > Delete Comment**.

Redlining

Redlining allows you to add annotation directly over a viewpoint. It is mutually exclusive to the navigation modes so that when you are redlining, you cannot navigate and vice versa.

You can also associate redlining with saved viewpoints in the Clash Detective results.

The redline tools, which can all be accessed from the **Redline Tools** control bar or from the **Review > Redline** menu, are:



Text - adds text over a viewpoint.



Tag - adds a tag over a viewpoint.



Freehand - enables you to sketch over a viewpoint.



Line - draws a single line over a viewpoint.



Line String - draws a string of lines over a viewpoint.



Ellipse - draws an ellipse over a viewpoint.




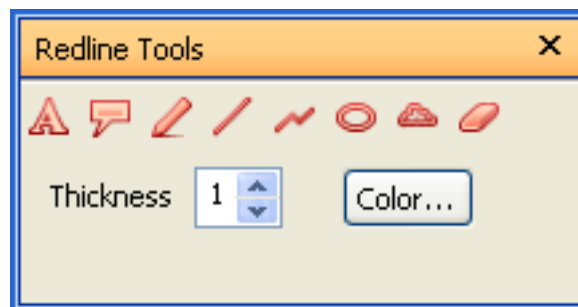
Cloud - draws a cloud over a viewpoint



Erase - erases the selected redline.

Adding Redlines

The **Redline Tools** control bar is a dockable bar like all others in NavisWorks. It can be accessed by clicking  on the **Workspace** toolbar or by clicking **Tools > Redline**.



Note:

Redlines can only be added to a saved viewpoint or to a clash result which has a saved viewpoint. If a viewpoint is not selected, a warning is given if a redline tool is selected.

Redline Tags are the exception to this rule. If a viewpoint is not already saved, then adding a tag will automatically save a viewpoint. See [“ Adding Redline Tags ”](#) for more information.


Adding a redline to a saved viewpoint:

1. Go to a saved viewpoint, or a Clash Detective result with the **Save Viewpoint** check box selected on the **Results** tab of the **Clash Detective** window.
2. Ensure the **Redline Tools** control bar is displayed as outlined above.
3. Type the thickness of the redlines into the **Thickness** edit box. The thickness applies to the redlines you are about to draw and will not change any existing redline thicknesses.

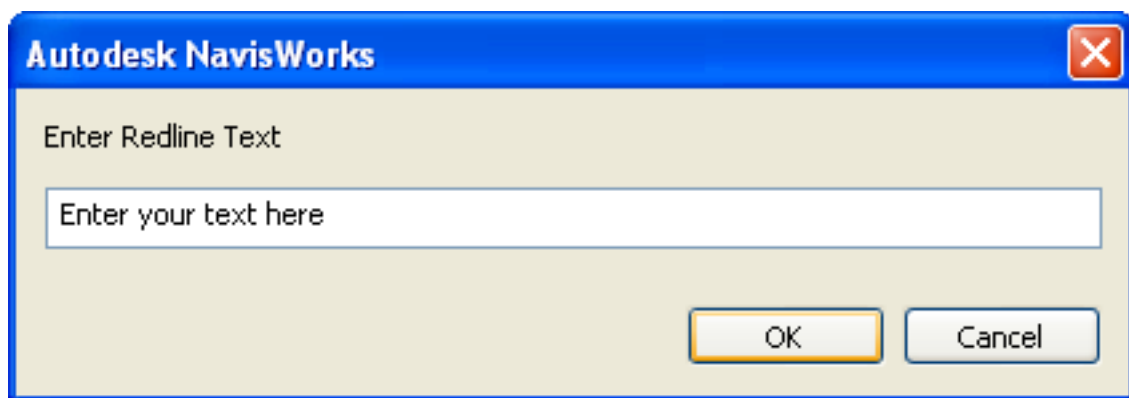
Note:

Thickness does not affect redline text. This is a default size and weight.

4. To change the color of the redline (they don't have to be red!), click on the **Color** button to open the standard Windows™ color chooser. This color applies to the redlines you are about to draw and will not change any existing redline colors.
5. Click the icon with the desired type of redline to create it:

- Choose the **Text**  redline tool to add text over the viewpoint. Click in the main navigation window where you wish to start entering text.

The redline text dialog will be displayed.



Enter the text you wish to add, then click **OK** to add the text, or **Cancel** to return to NavisWorks without adding it.







Note:

Text can only be added in a single line with this redline tool. To display text on multiple lines, you will need to write each line individually.

-



redline tool to add a tag on the current view. See “ [Adding Redline Tags](#) ” for more information.

- Choose the **Freehand**  redline tool to sketch over the viewpoint. Simply click and drag the left mouse button in the main navigation window to interactively sketch a redline.
 - Choose the **Line**  redline tool to draw single lines over the viewpoint. Alternately click the start and end points of lines with the left mouse button in the main navigation window.
 - Choose the **Line String**  redline tool to draw a string of lines over the viewpoint. Clicking the left mouse button in the main navigation window to add a new point in the line string. When the string is complete, click the right mouse button to end the line and you can then start a new line string.
 - Choose the **Ellipse**  redline tool to draw ellipses over the viewpoint. Click and drag a box in the main navigation window with the left mouse button to outline the ellipse.
 - Choose the **Cloud**  redline tool to draw clouds over the viewpoint. With the left mouse button, click points in the main navigation window in a clockwise direction to draw the arcs of the cloud (if you go counter-clockwise, the arcs will be inverted!). Right click with the mouse button to automatically close the cloud.
6. Choose the **Erase**  redline tool to erase all redlines from the viewpoint.


Note:

You can also access all the redline tools from the **Review > Redline** menu.

Adding Redline Tags

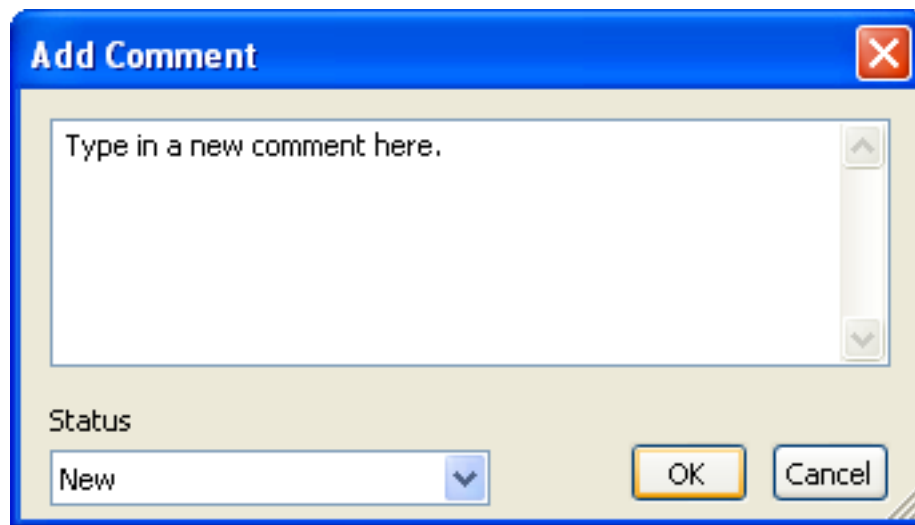
Redline Tags combine the features of redlining, viewpoints and comments into a single, easy to use review tool. This allows you to tag anything you want to identify in the model scene. A viewpoint will be created and you can add a comment and status to the tag. For example, during a review session, you may observe an item in the scene that is incorrectly sized or positioned. You can then tag this item, identifying the problem. This tag information can be saved into a NavisWorks review file (*.nwf) and distributed to the design team. The design team may then search the file, say for any tags of status 'new'. Once any necessary modifications are made to the drawing files, these can be reloaded into the *.nwf file and the tag status changed accordingly. You can review this latest version of the review file, ensure all tags have been resolved and finally 'approve' them.

Adding a redline tag to the current viewpoint:

1. Ensure the **Redline Tools** control bar is displayed as outlined in the previous section.
2. Choose the **Tag**  redline tool.
3. Click in the navigation window where you wish the tag to be attached to.
4. Click again in the navigation window where you wish the tag ID to be positioned. Both points will be joined by a leader line.

If the current viewpoint is not already saved, then it will be saved automatically and named 'Tag View X', where X is the tag ID.

The **Add Comment** dialog will be displayed.



5. Enter the text to be associated with the tag and set the **tag status** from the drop-down list.
6. Click **OK** to save the tag, or **Cancel** to return to NavisWorks without saving it.

Finding Redline Tags

During a review session you may create tens, or hundreds of tags which are communicated and referred to amongst the review team. It may therefore be necessary to locate tags by ID, status or author.

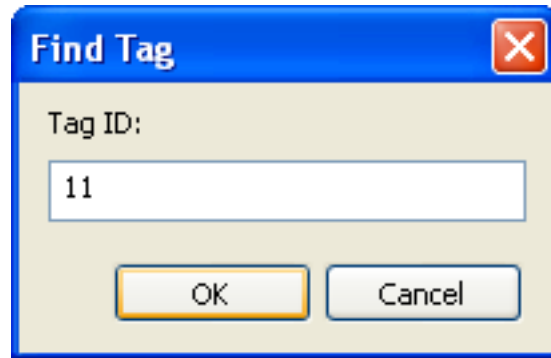
As redline tags utilize the **Comments** dialog, this allows you to use the **Find Comments** dialog to search for tags with specific text or ID, of a particular status, or by author or date created. See "[Finding Comments](#)" for more information on this search method.

NavisWorks also has additional review features specifically for finding tags.

Quick finding of redline tags:

1. On the **Review** menu, click **Tags > Find Tag By ID** if you know the ID of the tag you wish to find.

The **Find Tag** dialog will be displayed.



Enter the tag ID, then click **OK** to find the tag, or **Cancel** to return to NavisWorks.

2. Go to **Review, Tags, Current Tag** to select the current tag.
3. Go to **Review, Tags, First Tag** to find the first tag.
4. Go to **Review, Tags, Last Tag** to find the last tag.
5. Go to **Review, Tags, Previous Tag** to find the tag preceding the current tag.
6. Go to **Review, Tags, Next Tag** to find the tag following the current tag.

Editing Redline Tags

The comments and status assigned to a tag can be edited. As redline tags utilize the **Comments** dialog, editing tags is the same as editing a comment. See [Editing a Comment](#) for more information.

If different users have been reviewing and redline tagging the same model file, each saving their own .nwf, it is likely that some of their tag ID's will be the same. Using the Merge command to merge the different .nwf files together, only one copy of the geometry would be loaded and any tag viewpoints of the same name would be suffixed with the .nwf filename in brackets. All tag ID's however would be retained. In this situation, it is possible to renumber all of the ID's to make them unique. Again, as redline tags utilize the **Comments** dialog, renumbering tag ID's is the same as renumbering comment ID's. See [Renumbering Tag and Comment IDs](#) for more information.

Measuring

Measuring allows you to measure between points on items in the model. All measurements are made in the scene's units. For information on how to set the units, see [Units Options](#).

Like redlining and selecting, it is mutually exclusive to the navigation modes so that when you are measuring, you cannot navigate and vice versa.

The measure tools, which can all be accessed from the **Measure Tools** control bar or from the **Review > Measure** menu, are:



Point to point - measures the distance between two points.



Point to multiple points - measures the distance between a base point and various other points.



Point line - measures a total distance between multiple points along a route.



Accumulate - calculates the sum total of several point-to-point measurements.



Angle - calculates an angle between two lines.



Area - calculates an area on a plane.




Clear - clears the view of all measurement lines and restarts the measurement.



Transform objects - enables you to reposition or rotate an object.

Measuring Tools

The **Measure Tools** control bar is a dockable bar like all others in NavisWorks. It can be accessed by clicking  on the **Workspace** toolbar or by clicking **Tools > Measure**.

Measure Tools

Start (m)

4636.00

-1135.47

3250.84

End (m)

9934.01

-87.00

1016.06

Difference (m)

5298.01

1048.47

-2234.79

Distance (m)

5844.87

Use the buttons at the top to select the type of measurement you want to do.

For all measurements, the x-, y-, and z- coordinates of the **Start** point and **End** point are displayed in the







text boxes underneath the buttons, as are the **Difference** and the absolute **Distance**. If an accumulative measure is being used, such as **Point Line** or **Accumulate**, **Distance** will show the accumulated distance for all points registered in the measurement. All these measurements are shown in scene units. All points will be represented in the main navigation window with a small cross, and all lines being measured, by a simple line between points. You can use the Measure Options to choose how these are displayed.

Note:


It goes without saying that you must click on a point on an item to register a point - clicking on the background will not register anything, but it is worth noting that you can *snap* to certain points on items - see "[Snapping](#)" for more details.

You can reset a measure command at any time by right clicking instead of left clicking in the main navigation window. This will start the measure command again with no points registered, just as if you had chosen a new measurement type.

Measuring between points on items:

1. Ensure the **Measure Tools** control bar is displayed as outlined above.
2. Click the icon with the desired option to start measuring geometry objects:
 - To simply measure the distance between two points, choose the **Point to Point** measurement type  on the **Measure Tools** control bar and click on the start point and then the end point with the left mouse button.
 - To lock the start point and then click on multiple different end points, choose the **Point to Multiple Points** measurement type  on the **Measure Tools** control bar and click on the start point. Every other click after the start point will then register a new end point, but you can right click to reselect a start point.
 - To measure the distance along a path or route, choose the **Point Line** measurement type  on the **Measure Tools** control bar and simply click on a series of points along the path. The **Distance** will display the total distance along the path from the start point. Right clicking will enable you to select a new start point.
 - To calculate the sum total of several point-to-point measurements, choose the **Accumulate** measurement type  on the **Measure Tools** control bar and click on start and end points alternately. The **Distance** will show the sum of all point-to-point measurements since the first start point. Right clicking will enable you to reset the distance to zero and restart the calculation.
 - To calculate an angle between two lines, choose the **Measure Angle** measurement type  on the **Measure Tools** control bar and click on a point on the first line, followed by the intersection of the two lines, followed by a point on the second line. The **Angle** will show the angle between the three points. Right clicking will enable you to select a new first point.
 - To calculate an area on a plane, choose the **Measure Area** measurement type  on the

Measure Tools control bar and simply click on a series of points to describe the perimeter of the area you wish to calculate. The **Area** will show the area of the perimeter described since the first point, as projected onto the plane of the viewpoint. This means that all your points should lie on the same plane for your area calculation to be perfectly accurate. Right clicking will enable you to select a new first point.

- To clear the view of all measurement lines and restart the measurement, choose the **Clear** button  on the **Measure Tools** control bar. This is the same as right clicking during a measurement.

Snapping

The **Options Editor** allows you to set the cursor to snap to the nearest vertex, edge or line end. Points and snap points are automatically snapped to. Different cursors feed back what is being snapped to:



No snap, but a point on a surface is found.



A vertex, point, snap point or line end is found to snap to.



An edge is found to snap to.

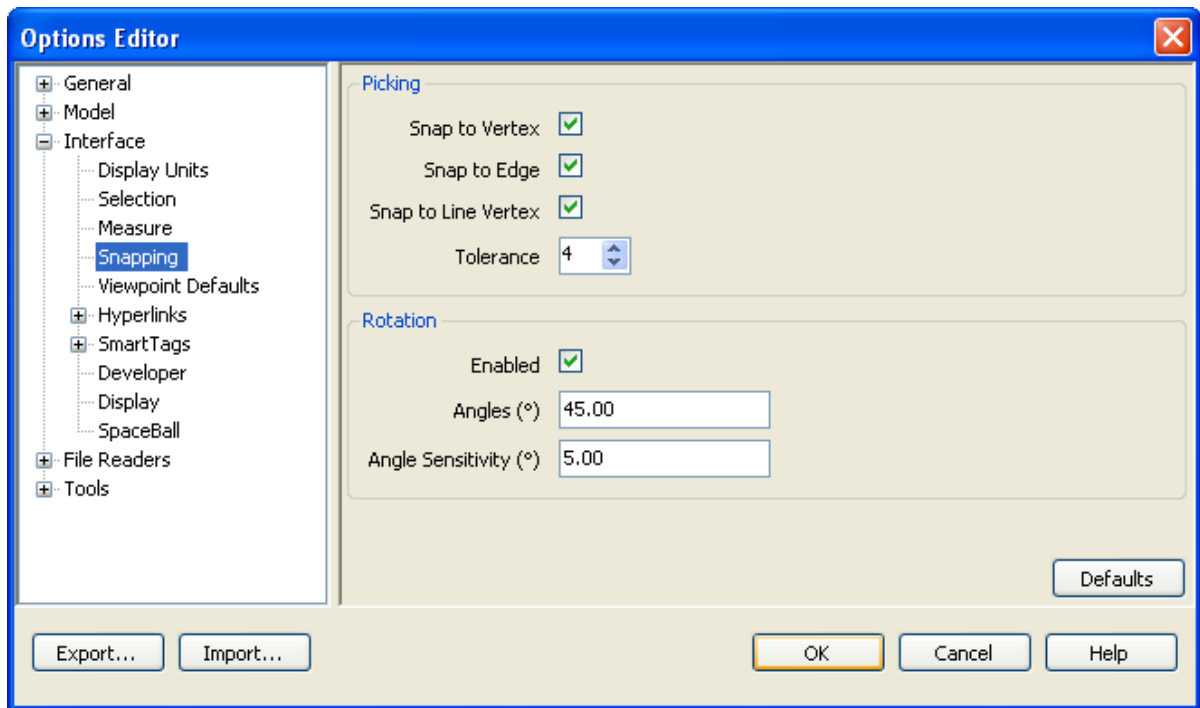
Note:

The geometry in NavisWorks is tessellated with triangles, and therefore the cursor will snap to edges that may appear to be in the middle of a face. Viewing the model in hidden line mode will make it clear which vertex or edge the cursor is snapping to.

To adjust snapping:

1. On the **Tools** menu, click **Global Options**.
2. Expand the **Interface** node in the **Options Editor** dialog box, and click the **Snapping** option.

The Snapping page is displayed.



3. Set the picking style by selecting the **Snap to Vertex**, **Snap to Edge** and **Snap to Line Vertex** check boxes. The cursor will snap to the nearest vertex, triangle edge or line end respectively, depending on the options chosen.
4. Set the snapping **Tolerance**. The smaller the tolerance, the closer the cursor needs to be to a vertex or edge before it snaps to it.
5. Select the **Enabled** check box, if you want to turn on snapping for angular rotation.

Enter the multiplier for the snapping angle, for example 45, in the **Angles** box. In this example, the cursor is set to snap to 45, 90, 135 degrees, and so on.

Enter the snapping tolerance, for example 5, in the **Angle Sensitivity** box. This determines how close to the snapping angle the cursor needs to be for snap to take effect. In this example, the cursor snaps within 5 degrees of a given angle.

6. Click **OK** to set these options or **Cancel** to exit the dialog box without setting them.

Transforming Objects

The transform objects tool allows you to reposition or rotate an object, defined by points selected with the measure tools. You can also manipulate geometry objects by using the **Object Manipulation** toolbar. For more information, see [Chapter 21, Object Manipulation](#)

Repositioning objects:


1. Select the object to be repositioned (see [Chapter 13, Selecting Items](#) for more information on how to

do this).

2. Choose one of the measure tools, from **Point to Point**, **Point Line** or **Accumulate**.
3. Select a **base point** on the selected object. This is the reference point on the object from which the repositioning will be calculated.
4. Select another point in the scene (or multiple points, depending on which measure tool you selected). This is the point (or points) which the **base point** will be repositioned to.


Note:

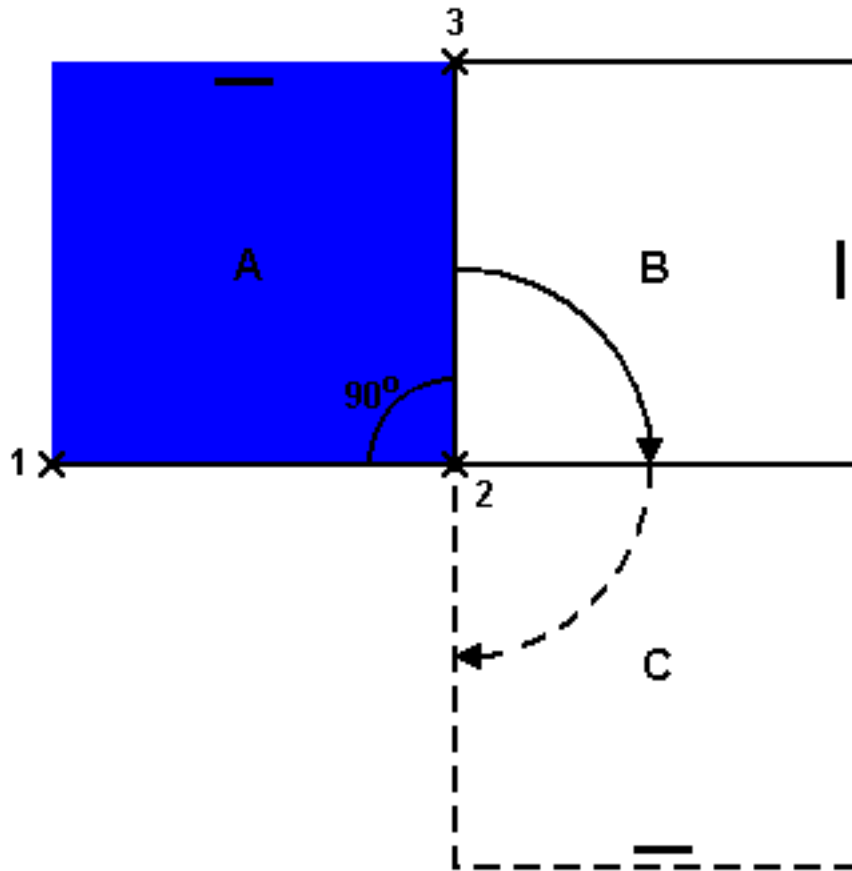
You can only select a point on another object in the scene. Selecting a point in 'space' is not a valid option. To reposition an object into 'space', you can override the items **Transform**. See "[Overriding Transforms](#)" for details on how to do this.

5. Click **Transform Objects**  to reposition the object at the second point. If you used one of the multiple point measure tools and selected multiple points in the scene, clicking **Transform Objects** again will reposition the object to the next point, and so on.


NavisWorks also provides the ability to rotate an object.

Rotating objects:

1. Select the object to be rotated (see [Chapter 13, Selecting Items](#) for more information on how to do this).
2. Choose the **Measure Angle**  measure tool.
3. See diagram below:



Select three points (1, 2, 3). The second point (2) will be the position about which the selected object (A) will be rotated. Lines from the first to the second point (1 to 2) and from the second to third point (2 to 3) will define the angle by which the object will be rotated (in the above case, 90 degrees).

4. Click **Transform Objects**  to rotate the object about the second point (rotate selected object by 90 degrees about point 2, which results in object rotating from point A to B).
5. Click **Transform Objects** again to continue rotating the object about point 2, by the specified angle (rotate selected object by 90 degrees about point 2 again, which results in object rotating from point B to C).

See “[Resetting Items' Positions](#)” for information on returning an object back to its original position.

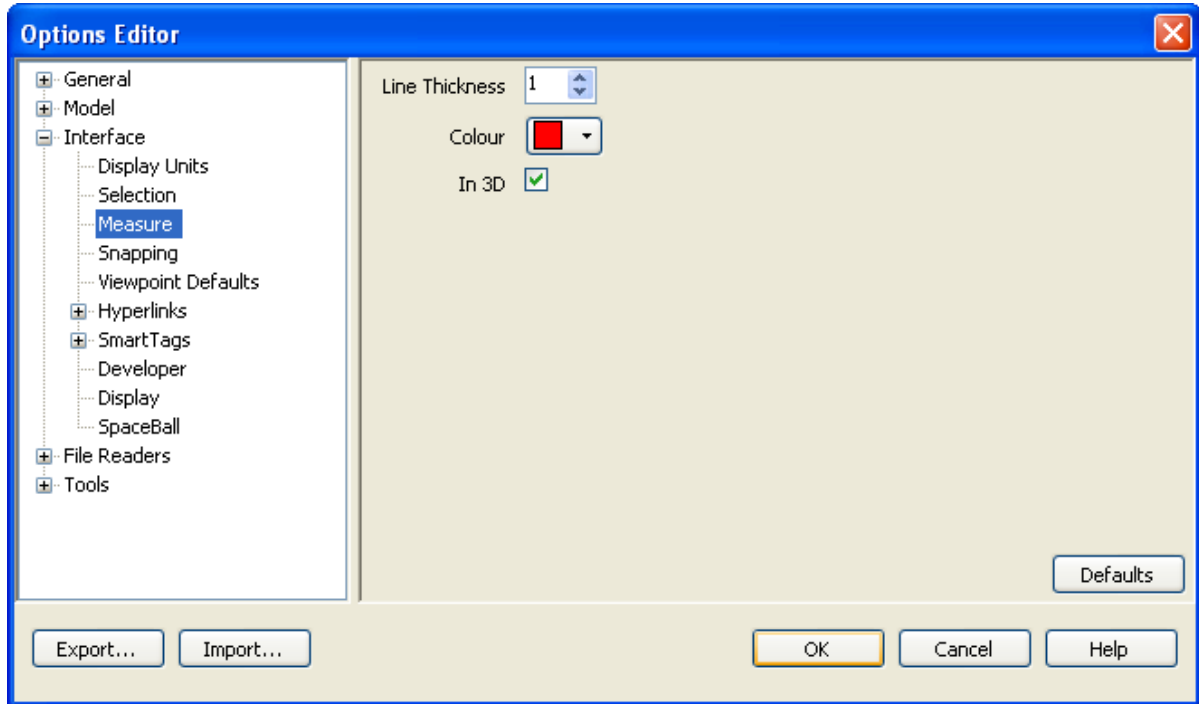
Measure Options

NavisWorks allows you to configure the appearance and selection style of the measure tools and the measurement drawing in the main navigation window.

Setting measure options:

1. On the **Tools** menu, click **Global Options**.
2. Expand the **Interface** node in the **Options Editor** dialog box, and click the **Measure** option.

The **Measure** page is displayed:



3. Set the **Color** and **Line Thickness** of the measure lines.
4. Check the **In 3D** check box if you want to draw the measurements in 3D in the main view. They then act as 3D lines in the scene which can be obscured by other geometry. If this box is unchecked, then all measurement lines are drawn in 2D over the top of the all geometry.
5. Click **OK** to set the options or **Cancel** to exit the dialog without setting them.

Hyperlinks

Hyperlinks are an extremely useful review tool to allow you to access non-graphical information through the graphical interface of NavisWorks. As well as hyperlinks being converted from the native CAD files you open in NavisWorks, you can also "override" an item's hyperlinks by attaching multiple additional hyperlinks to it. Because hyperlinks are treated as a property by NavisWorks, they can be searched on with the **Find Items** tool and displayed in the **Properties** bar. They are also saved into NavisWorks files so that as the model changes, the links remain for you and others to view.

Hyperlinks are categorized so that you can switch them on and off by category, and they can be anything internal (such as a viewpoints or selection set) or external (such as a web page, script, or spreadsheet) to NavisWorks. By turning on hyperlinks in the main navigation window, you can simply click on the link to activate it. Hyperlinks can be displayed as a text description, or as an icon and can also optionally have leader lines pointing to points on the item to help you identify which item has the link attached.

To turn on hyperlinks:

- Click **Hyperlinks**  on the **Workspace** toolbar

or

- On the **Tools** menu, click **Hyperlinks**.

Adding Hyperlinks

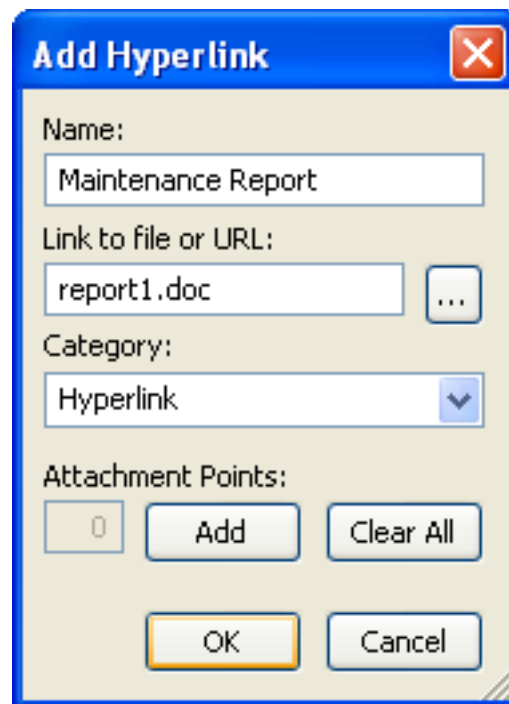
An item can have multiple hyperlinks attached to it, although only the default hyperlink (the one at the top of the list) can be displayed in the navigation window at one time. The default is the link that will be followed when clicked.

Adding hyperlinks to an item

- Select a single item (see [Chapter 13, *Selecting Items*](#) for more details on how to do this) to which you want to attach a hyperlink and click **Review > Hyperlinks > Add Hyperlink** on the menu.

Alternatively, right-click the item to which you want to attach a hyperlink and click **Hyperlinks > Add Hyperlink** on the shortcut menu.

The **Add Hyperlink** resizable dialog is displayed



- Type in the name of the hyperlink into the **Name** text box.
- Type in, or browse to, the actual hyperlink value in the **Link to file or URL**. This is what will be linked to when the hyperlink is clicked on.

4. Choose the category that the hyperlink will belong to from the **Category** drop down. You can add more categories than the default **Hyperlink** and **Tag** categories by simply typing in the name of your category into this box. See “[Hyperlinks Categories](#)” for more information on categories.
5. If you want the hyperlink to be attached to a specific point on the item, instead of the default center of the item's bounding box, then click the **Add** button. A cross-hair cursor will appear in the main navigation window, allowing you to select a point on the item where the hyperlink will be attached to. See “[Attachment Points](#)” for more information on attachment points.
6. Click the **Clear All** button if you want to delete all attachment points associated with this hyperlink and revert to the hyperlink being attached to the center of the item's bounding box.
7. Click **OK** to add this hyperlink to the item or **Cancel** to return to NavisWorks without attaching anything.

Hyperlinks Categories

Hyperlinks can be categorized so that you can group them to distinctly display or not display in the main navigation window at one time. The seven default categories are:

- **Hyperlink**
- **Tag**
- **Viewpoints**
- **Selection sets**
- **Redline tags**

Tags are just hyperlinks that are displayed by name rather than by icon in the navigation window. The last three of these categories are defined by NavisWorks and so you cannot assign a hyperlink to one of these categories, other than by setting up a viewpoint, a selection set, or a Clash Detective result.

To add a new category, simply type in the name of the category into the **Category** box in the **Add Hyperlink** dialog when you are adding or editing a hyperlink.

You can customize the display of both standard and user-defined categories in the **Options Editor**.

Displaying Hyperlinks

To turn on hyperlinks:

- Click **Hyperlinks**  on the **Workspace** toolbar

or

- Click **Tools > Hyperlinks** on the menu bar.

Hyperlinks are drawn as icons in the main navigation window and tags as text. Clicking a hyperlink in the

main navigation window will follow the link and right-clicking it will open a shortcut menu offering you the options of **Follow Hyperlink**, **Edit Hyperlink** (see “ [Editing Hyperlinks](#) ”) or **Select item containing hyperlink**, which will select the item onto which the hyperlink is attached.

Attachment Points

Hyperlinks and tags are by default attached to the center of their owner's bounding box, but you can override this with more convenient attachment points. When adding or editing a hyperlink, you have the option of adding attachment points, as described in “ [Adding Hyperlinks](#) ”. If you add more than one attachment point, the hyperlink will be displayed attached to the *closest* attachment point to the camera during navigation. This allows you to set up hyperlinks so that they are always available for following when drawn in 3D mode during navigation, rather than disappearing behind objects. Leader lines will be drawn from the attachment point to the hyperlink. The size of these lines can be defined in Hyperlinks Options.

Following Hyperlinks

To follow a hyperlink, simply click on it in the main navigation window. If multiple hyperlinks are attached to an item, the default hyperlink will be followed.

You can also follow one of the non-default hyperlinks attached to an item by selecting the item and clicking **Review > Hyperlinks** and selecting the hyperlink from the list.

The default hyperlink can also be followed from the Properties control bar by selecting the item, right-clicking any tab in the bar and clicking **Follow Default Hyperlink** on the shortcut menu.

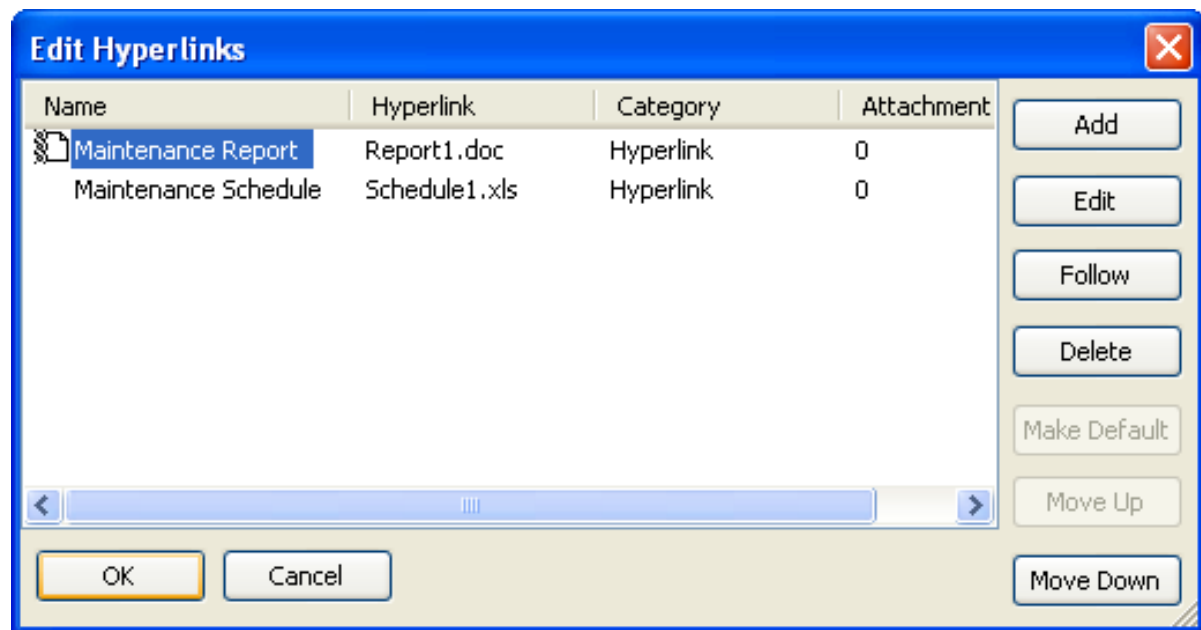
Editing Hyperlinks

To edit a hyperlink:

1. Select a single item (see [Chapter 13, Selecting Items](#) for more details on how to do this) from which you want to edit a hyperlink, and click **Review > Hyperlinks > Edit Hyperlinks** on the menu bar.

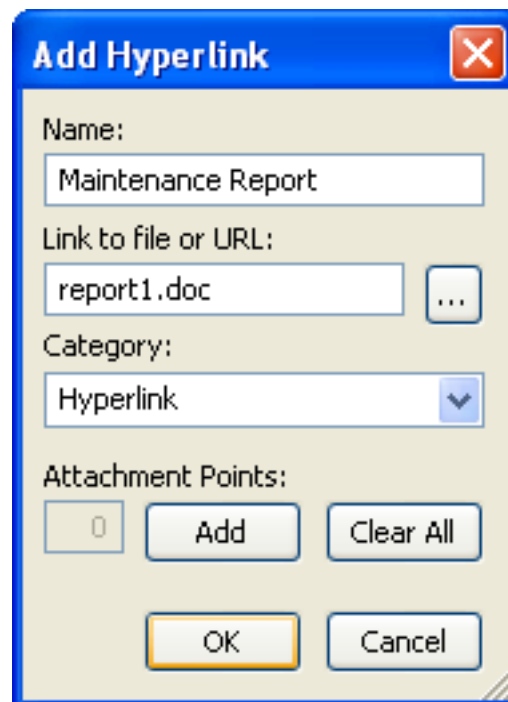
Alternatively, right-click the item from which you want to edit a hyperlink, and click **Hyperlinks > Edit Hyperlinks** on the shortcut menu.

The **Edit Hyperlinks** dialog is displayed.



2. Select the hyperlink under the **Name** column.
3. Click the **Edit** button.

The **Edit Hyperlink** dialog is displayed.



4. Complete this dialog as outlined in “ [Adding Hyperlinks](#) ”.
5. Move hyperlinks up and down the list using the **Move Up** and **Move Down** buttons, or by dragging

them to their new position in the list. This way you can prioritize a hyperlink to become the default hyperlink that is followed when click on in the main navigation window.

6. Click **OK** to confirm the edit or **Cancel** to return to NavisWorks leaving the hyperlink as it was.

Note:

You can also edit any original hyperlinks that have been converted from the native CAD files. If you do this, save the changes in an .nwf file, then change the hyperlink in the original CAD file, and reopen the .nwf file in NavisWorks, then your edit "overrides" will remain. If you haven't edited the hyperlinks in NavisWorks, however, the updated links from the CAD file will appear.

Deleting Hyperlinks

You can delete *all* hyperlinks from the selected item by right-clicking any tab in the Properties control bar and choosing **Delete Hyperlinks** on the shortcut menu.

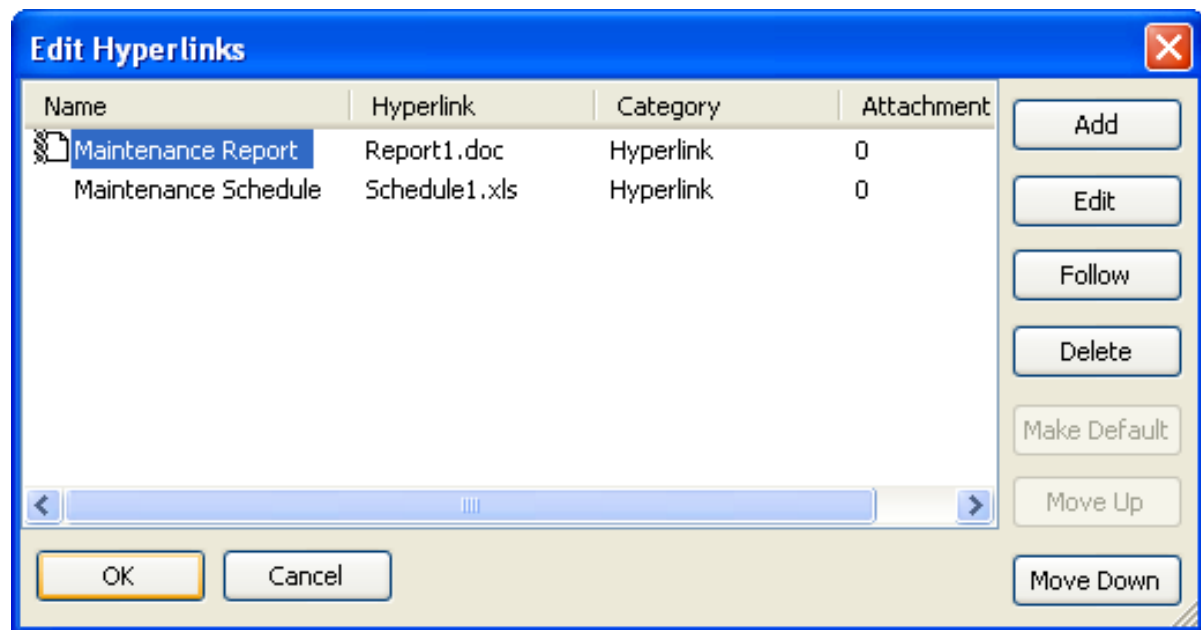
You can reset all the hyperlinks on an item to those that were originally converted from the CAD file, by clicking **Edit > Reset Item > Reset Hyperlinks** with an item selected. Likewise, you can reset all the hyperlinks on *all* items in the scene to their original state by clicking **Edit > Reset All > Reset All Hyperlinks**.

Deleting a single hyperlink from an item:

1. Select a single item (see [Chapter 13, Selecting Items](#) for more details on how to do this) from which you want to delete a hyperlink and click **Review > Hyperlinks > Edit Hyperlinks** on the menu bar.

Alternatively, right-click the item from which you want to delete a hyperlink and click **Hyperlinks > Edit Hyperlinks** on the shortcut menu.

The **Edit Hyperlinks** dialog is displayed.



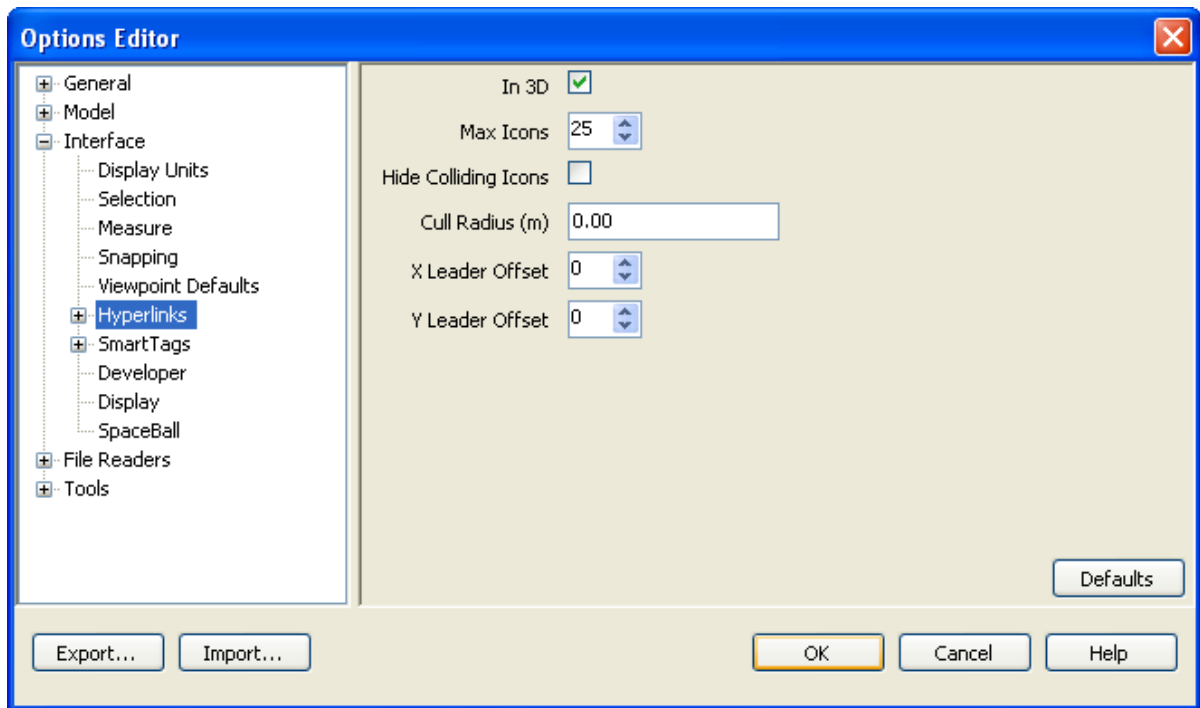
2. Select the hyperlink under the **Name** column.
3. Click the **Delete** button.
4. Click **OK** to confirm deletion or **Cancel** to return to NavisWorks without the hyperlink deleted.

Hyperlinks Options

Setting hyperlinks options:

1. On the **Tools** menu, click **Global Options**.
2. Expand the **Interface** node, and click the **Hyperlinks** option.

The Hyperlinks page is displayed:



3. Icons that appear overlapped in the main view can be hidden if the **Hide Colliding Icons** check box is selected.
4. Enter the distance in the **Cull Radius** box for how close hyperlinks have to be in order to be drawn in the main view. Any hyperlinks further away than this distance will not be drawn. The default value of 0 means that all hyperlinks will be drawn.
5. Select the **In 3D** check box if you want to draw the hyperlinks icons in 3D in the main view. They then float in 3D space just in front of their attachment points to the items. If this box is unchecked, then all hyperlink icons are drawn in 2D over the top of the all geometry.

Note:

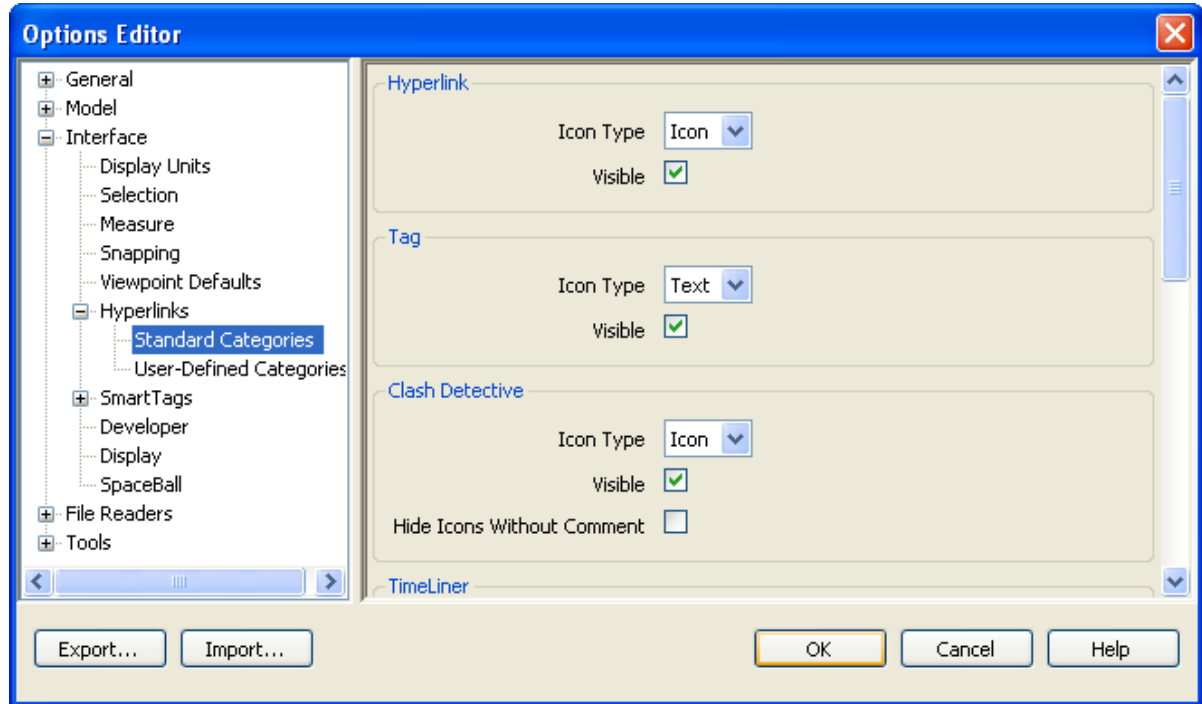
In 3D mode hyperlinks can become hidden by other objects in the scene when you are navigating.

6. Enter the maximum number of icons to draw in the main view in the **Max Icons** box.
7. Hyperlinks can be drawn with leader lines (arrows) pointing to the attachment point on the item that the hyperlink is attached to. Enter the X- and Y- distance in **Leader Offset** for the number of pixels to the right and up that these leader lines will use.
8. Click **OK** to set the options or **Cancel** to exit the dialog without setting them.

Configuring standard hyperlinks categories:

1. On the **Tools** menu, click **Global Options**.
2. Expand the **Interface** node, expand the **Hyperlinks** option, and click **Standard Categories**.

The Categories page is displayed:



3. Each hyperlink is a member of a category. This enables you to easily manage sets of hyperlinks. Use the **Visible** check box to switch a category on or off in the main view. Some categories also have comments associated with them. Use the **Hide Icons Without Comments** check box, if available, to do exactly that - only draw hyperlinks that have a comment attached to it, so that you can see any areas of issue in the model. See "[Commenting](#)" for more information on comments.
4. Use the **Icon Type** field to specify how to display the hyperlink.

Select **Icon** to use a default hyperlink  icon in the main view.

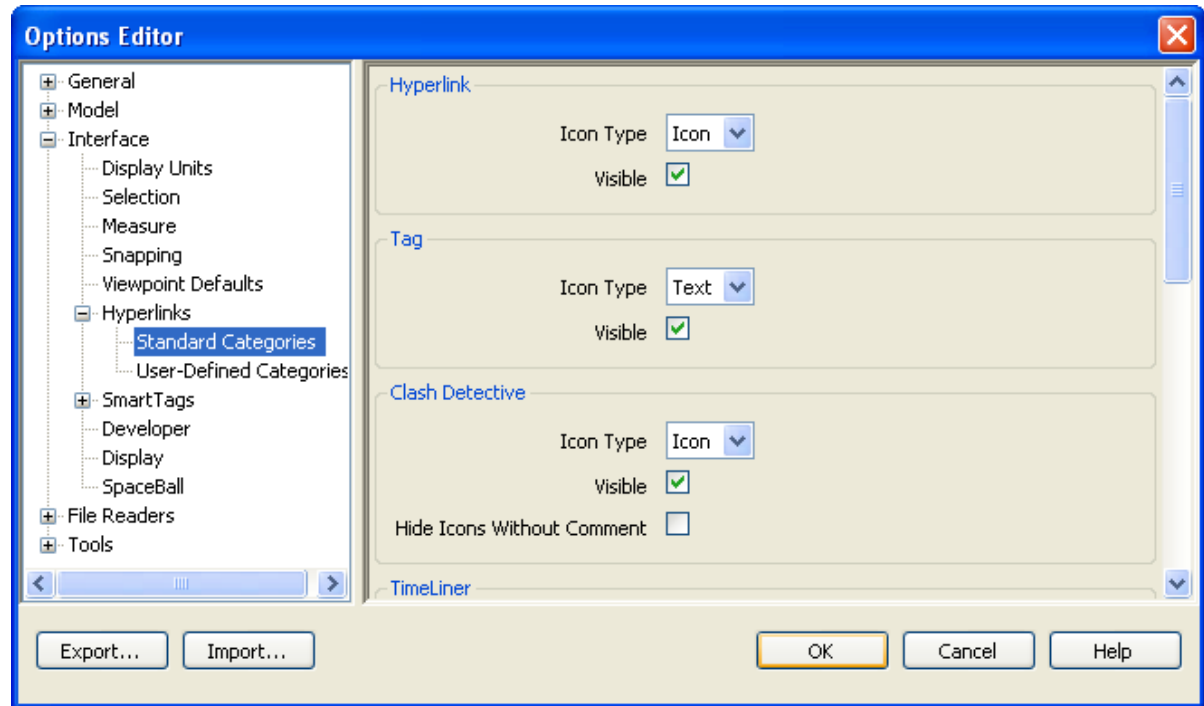
Select **Text** to use the hyperlinks description as a tooltip style text box in the main view instead of an icon.


5. Click **OK** to set the options or **Cancel** to exit the dialog without setting them.

Configuring user-defined hyperlinks categories:


1. On the **Tools** menu, click **Global Options**.
2. Expand the **Interface** node, expand the **Hyperlinks** option, and click **User-Defined Categories**.


The Categories page is displayed:






Only the custom hyperlink categories are shown here. The padlock  icon indicates that you cannot add or remove categories directly from here.

3. Choose the way categories are shown in the **Options Editor**:

Click **Grid View**  to display categories in a tabular format.


Click **List View**  to display categories in a list format (the same way as the standard categories are shown).

Click **Records View**  to display categories as records.

4. Use  and  to navigate between the categories. If you selected **Records View**, this is the only way to move between the records.

5. Use the **Visible** check box to switch a category on or off in the main view.

6. Use the **Icon Type** field to specify how to display the hyperlink.

Select **Icon** to use a default hyperlink  icon in the main view.

Select **Text** to use the hyperlinks description as a tooltip style text box in the main view

instead of an icon.

7. Click **OK** to set the options or **Cancel** to exit the dialog without setting them.

Smart Tags

Smart tags pop up information on the item hovered over by the cursor in a tooltip style window, without having to select the item itself. The smart tag will disappear after a few seconds. This is a useful way to quickly get information about an item in the main navigation window when navigation has ceased. The default information shown is the name and type of the item, but you can define which properties to show using the smart tags options.

Note:

If the item hovered over doesn't have the property requested, smart tags will search up the selection tree for a parent that does, so maximising the useful information you get.

To turn on smart tags:

- Click **Smart Tags**  on the **Workspace** toolbar

or

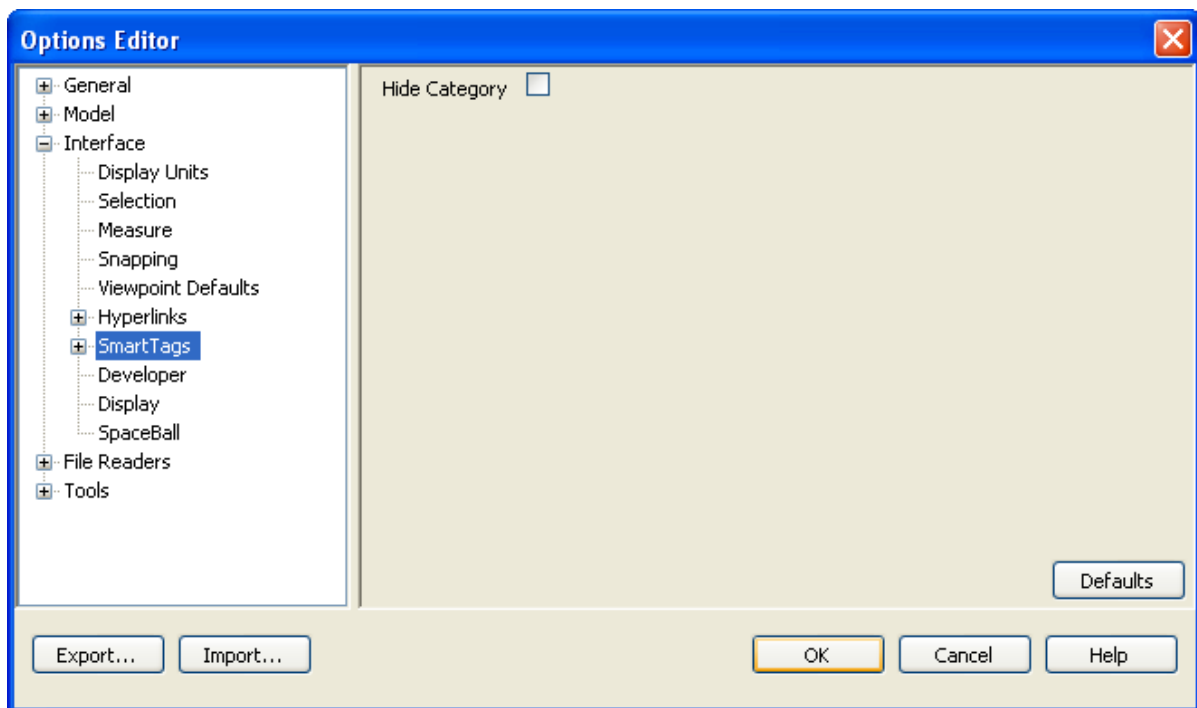
- On the **Tools** menu, click **Smart Tags**.

Smart Tags Options

Setting smart tags options:

1. On the **Tools** menu, click **Global Options**.
2. Expand the **Interface** node, and click the **Smart Tags** option.

The Smart Tags page is displayed.



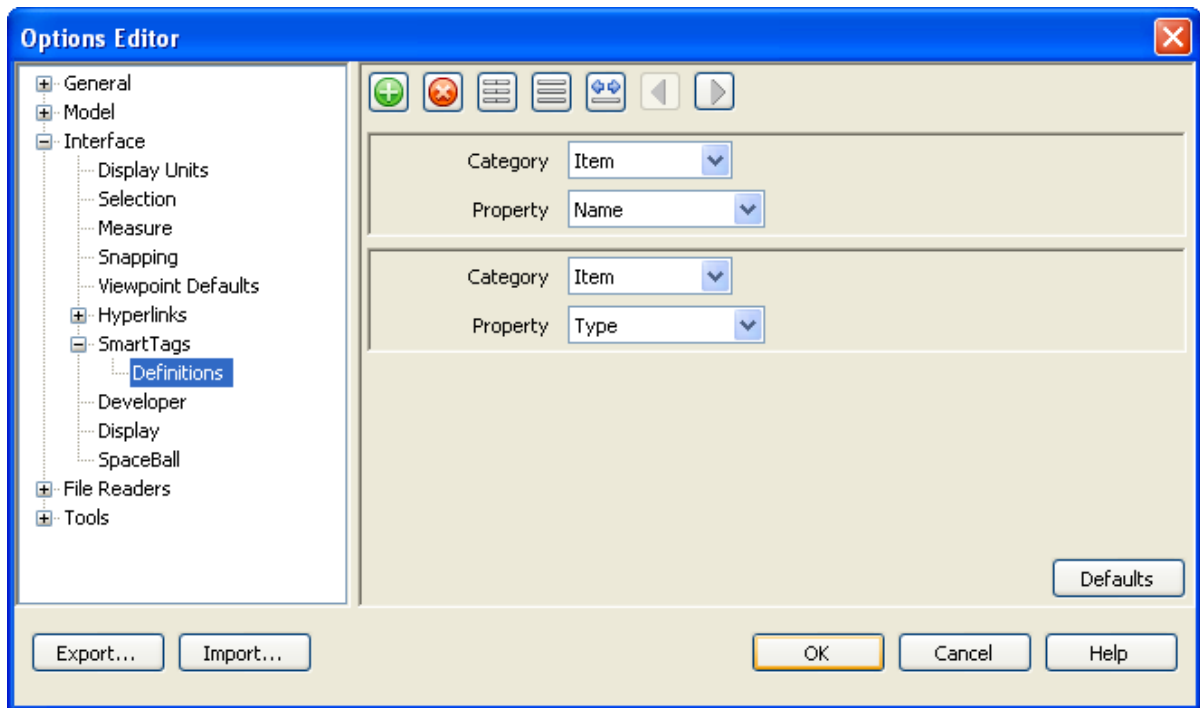
3. Select the **Hide Category** check box if you do not want to see category names included in the smart tags tooltip.
4. Click **OK** to set the options or **Cancel** to exit the dialog without setting them.

The default information displayed is the name and type of the item, but the actual information displayed can be customized.

Customizing smart tags:

1. On the **Tools** menu, click **Global Options**.
2. Expand the **Interface** node, expand the **Smart Tags** option, and click **Definitions**.


The Definitions page is displayed.







3. Choose the way smart tag definitions are shown in the **Options Editor**:

Click **Grid View**  to display definitions in a tabular format.

Click **List View**  to display definitions in a list format.

Click **Records View**  to display definitions as records.

4. Use  and  to navigate between the definitions. If you selected **Records View**, this is the only way to move between the records.
5. For every smart tag definition, you can change the **Category** and **Property** by clicking on the item and choosing the relevant entry from the drop-down list.
6. To add a smart tag definition, click .
7. To delete a smart tag definition, select it, and click .
8. Click **OK** to set the options or **Cancel** to exit the dialog without setting them.

Collaboration

The NavisWorks **Collaborate Bar** enables multiple users to participate in a single design review session across a Local Area Network (LAN). This utilizes the shared program features of Windows NetMeeting, available to all Windows users.


To get access to the collaboration tools, right-click anywhere in the toolbar area of the screen, and click **Collaborate Bar** on the shortcut menu.

All meeting participants require access to a NavisWorks .nwf or .nwd file, in a shared location. One of the participants will 'host' the meeting and place a call to invite the others to join the meeting. Any of the participants who have joined the meeting can take control and **drive** the session. All navigation performed by the driver will be displayed in the main NavisWorks window on each participants machine. Any viewpoints or markup (for example) added during the session can be updated on all participants machines at the click of a button.

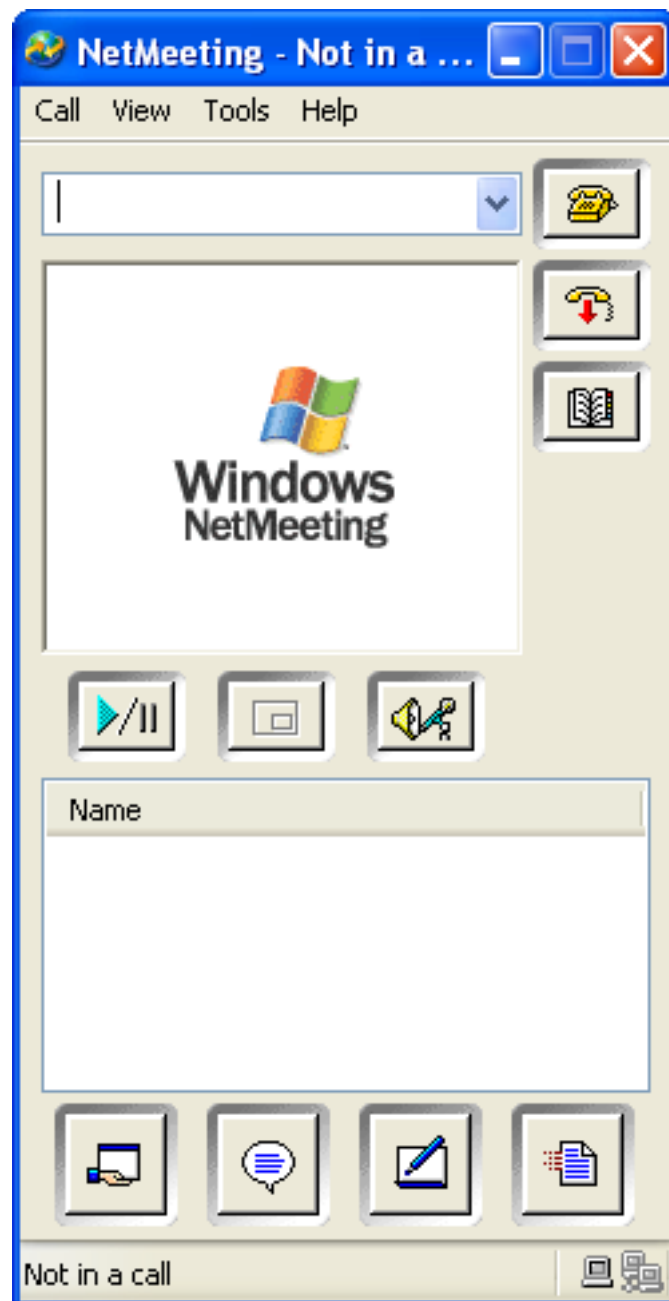
Note:

If a collaborative review session, as outlined here, is not conducted in single room, then additional tele-conferencing provisions could be necessary. This may be using the NetMeeting Whiteboard, or your own telephone system.

To start a collaboration session:

- Open the NavisWorks file that you wish to collaborate on from a shared directory (see “[Opening Files](#)”).
- Click **Collaborate**  on the **Collaborate** toolbar.

This will initialize Windows NetMeeting:



Note:

The first time Windows NetMeeting initializes, a setup wizard will take you through the setup process. You will need to enter your name and email address. When using NetMeeting on a LAN you do not need to log onto a directory server, as these will not be available to you.

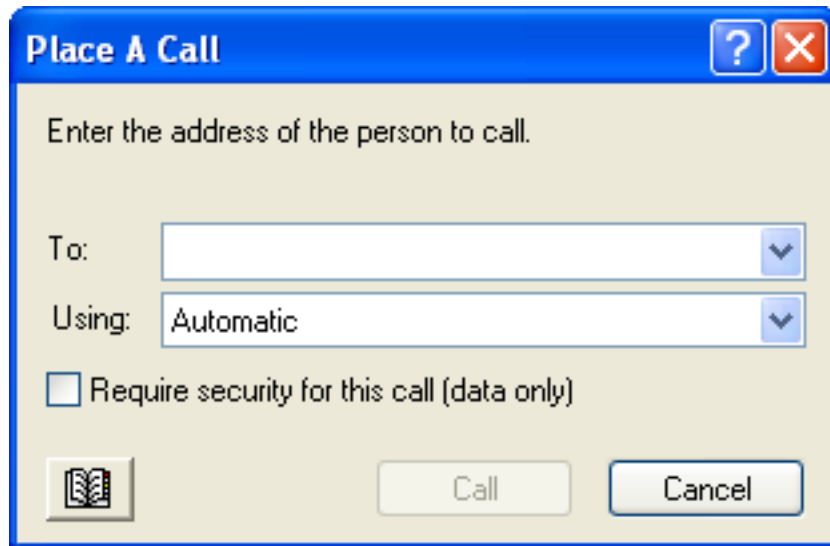
To place a call, inviting attendees to join:

-



on the **NetMeeting** dialog.

The **Place a call** dialog is displayed:



- In the **To:** box, enter the machine name or IP address of the machine you wish to join the meeting, then click **Call** to send the invite, or **Cancel** to return to NetMeeting.

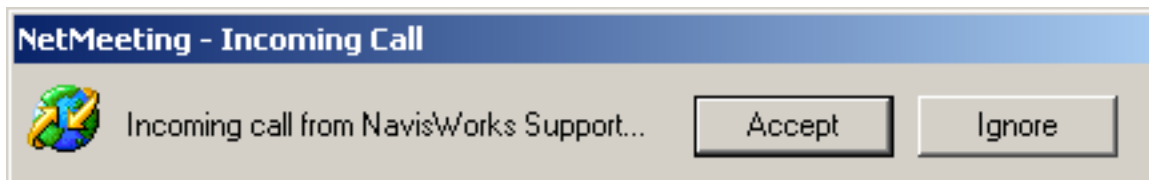
Once the person receiving the invite accepts this, both their name and yours will be listed in the NetMeeting dialog.

Note:

The above can be repeated to invite additional people to the meeting.

To accept an invitation:

- When you are invited to join a meeting, the **incoming call** dialog is displayed:




- Click **Accept** to join the meeting, or **Ignore** to decline the invitation.

Note:

Once you have accepted a call, you will need to start your own collaboration session. See "[Collaboration](#)" on p. 256 for more information.

During a collaboration meeting, anyone in the call can take control of the session and become the 'driver'. The driver will control navigation of the shared model on all machines in the call.

To become the driver:


- Click **Drive**  on the **Collaborate** toolbar.

Note:

Upon clicking the **drive** button, all other users in the call will receive a message advising that you are requesting control. They will have to answer **Yes** to this message if you are to drive NavisWorks on their machine.

Although real-time navigation in NavisWorks can be performed on all machines in a call by one user, it is not possible for review data such as saved viewpoints, comments and redlines, to be automatically updated on all users' machines. This information can however be updated on their machines by refreshing the model. This **refresh** process can be performed on one users machine and refresh all machines in the call.

To refresh all attendees machines:

- Click **Refresh**  on the **Collaborate** toolbar.

SwitchBack

SwitchBack allows the current view of the currently loaded file to be sent back to AutoCAD (version 2004 or later) or MicroStation-based CAD products.

Note:

The native CAD package must be installed on the same machine as NavisWorks for **SwitchBack** to work.

AutoCAD (version 2004 or later)

- For AutoCAD (version 2004 or later) or products based on it, first open the product in the usual manner and load the **nwexport** application. This can be done easily by running the **nwload** command in the command line. If **SwitchBack** needs to be available whenever AutoCAD is run, nwexport can be added to the set of startup applications in AutoCAD.
- Once the CAD package is running, and nwexport has been started, selecting an object in the scene will allow the **SwitchBack** command to be selected either from the **Review** menu, from the right-click shortcut menu of the object, or, if a Clash Detective tool is available, via the **SwitchBack** button on the **Results** tab. Selecting **SwitchBack** then takes the current NavisWorks camera view back to the CAD package.
- Switching back** to AutoCAD whilst an object is selected will not only set the view in AutoCAD, but also select the object. Selection of objects is done by entity handle, therefore, you must have **Convert**

Entity Handles option enabled when files are loaded into NavisWorks.

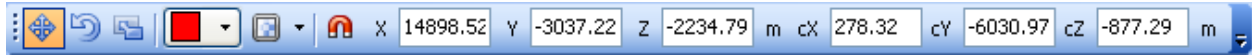
- Some objects cannot be selected in AutoCAD (for example, blocks) which may mean that running SwitchBack may be unsuccessful with a given selected object. If this is the case try selecting further up the object tree and trying again.

MicroStation (/J and v8)

- For MicroStation (/J and v8) or products based on it, first prepare MicroStation by loading the NavisWorks exporter "**mdl load nwexport6**".
- To get nwexport to load automatically when MicroStation is run, add "**nwexport6**" to the list of mdl applications run automatically on startup.
- Once the NavisWorks exporter has been run, selecting an object in the scene will allow the **SwitchBack** command to be selected either from the **Review** menu, from the right-click shortcut menu of the object, or, if a Clash Detective tool is available, via the **SwitchBack** button on the **Results** tab. Selecting **SwitchBack** then takes the current NavisWorks camera view back to the first visible view in MicroStation.
- If you wish to override the view used by **SwitchBack**, use the "**nwview <view number>**" key-in where **view number** is the visible window in MicroStation. This view setting is not saved between sessions.
- **Switching back** to MicroStation whilst an object is selected will not only set the view in MicroStation, but also select the object. Selection of objects is done by element id (MicroStation v8) or DMRS value (MicroStation /J).

Chapter 21. Object Manipulation

In this section you will learn how to modify position, rotation, size, color and transparency of geometry objects in your model by using the **Object Manipulation** toolbar.



To open it, right-click anywhere in the toolbar area of the screen, and click **Object Manipulation** on the shortcut menu.

All object manipulation is carried out the in the main NavisWorks window.

Note:

If objects are moved through the **Object Manipulation** toolbar, they are considered to be globally moved, as if they'd been changed in the original CAD model.



Translate Item



Rotate Item



Scale Item



Modify Item Color




Modify Item Transparency



Snap Item

Manual Entry boxes

Using Snapping

When you manipulate geometry objects by changing their position, rotation or size you can use snapping to control the precision of your operations in the main NavisWorks window. To turn on snapping mode, click the **Toggle Snapping**  button on the **Object Manipulation** toolbar.

The snap works like a 'gravity' around the snap points. This enables you to snap the start position of the selected visual tool to a relevant point on the screen, such as center, corner of bounding box, vertex of geometry. Similarly, the end point of the translation, rotation or scale operation can also be snapped to a desired point on the screen (for example, center of another geometry object).

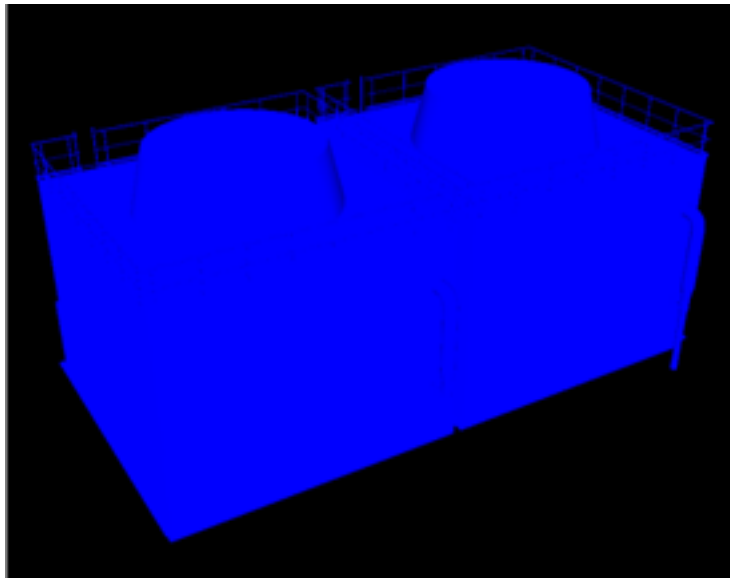
You can adjust the way snapping works by using the **Options Editor**. For more information, see ["Snapping"](#).

Highlighting Objects

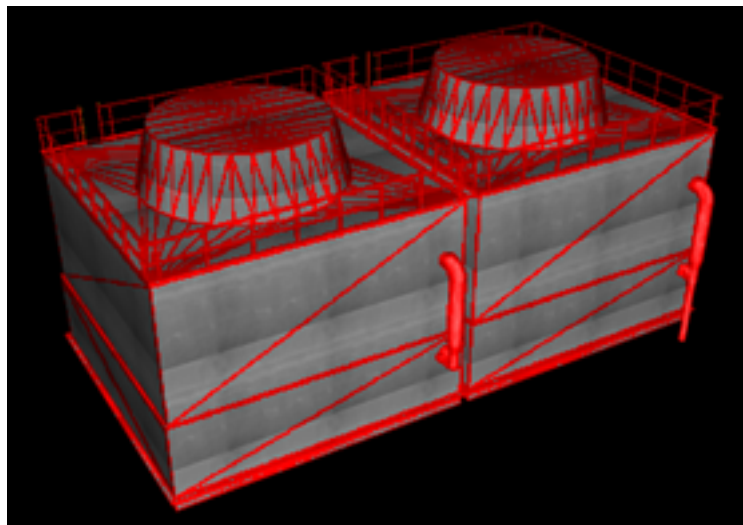
To get a clearer view of geometry objects in the main NavisWorks window, you can use the **Options Editor** to adjust the way in which the current selection is highlighted.

You can use three different highlighting methods:

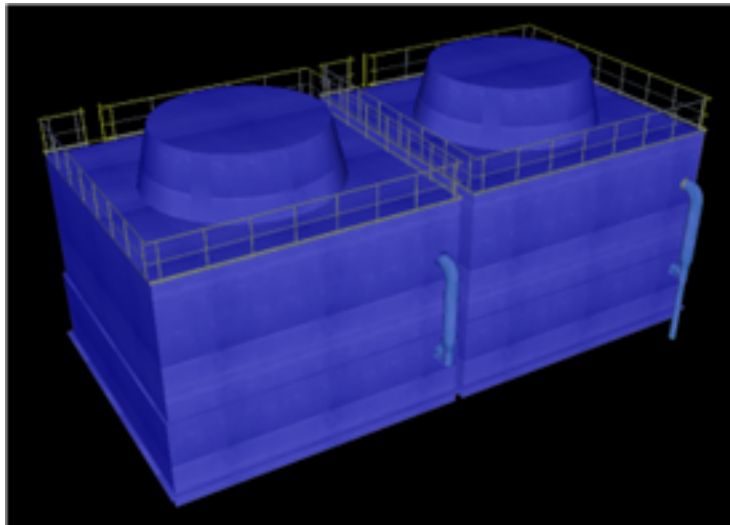
- Shaded



- Wireframe

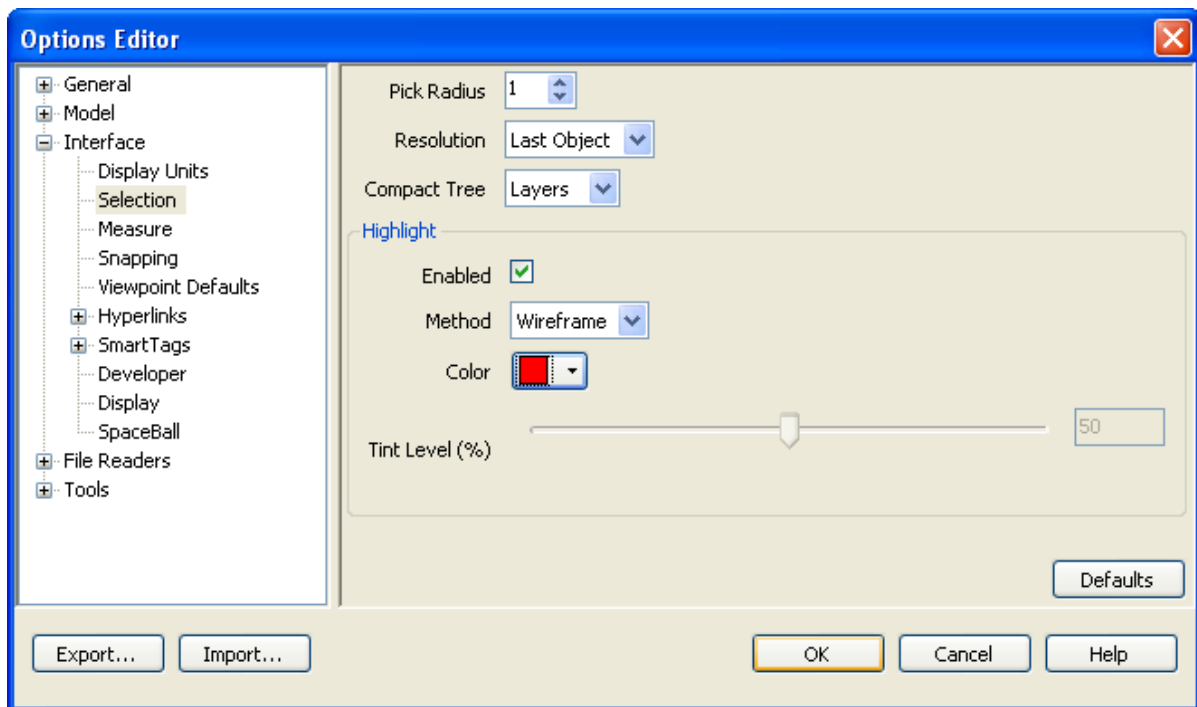


- Tinted



To adjust highlighting:

1. On the **Tools** menu, click **Global Options**.
2. Expand the **Interface** node in the **Options Editor** dialog box, and click the **Selection** option.
The Selection page is displayed.




3. Locate the **Highlight** area, and select the **Enabled** check box to turn on highlighting of the selected

items.

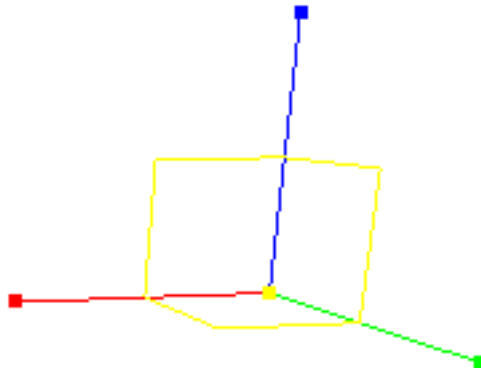
4. Use the **Method** drop-down list to select the type of highlighting you want (Shaded, Wireframe or Tinted).
5. Click the **Color** button to select the highlight color.
6. If you selected **Tinted** in the **Method** box, use the slider to adjust the **Tint Level**.
7. Click **OK** to set these options or **Cancel** to exit the dialog box without setting them.


Moving Objects

To move an object:

1. Select the object you want to move in the main NavisWorks window.
2. Click the **Translate Item**  button on the **Object Manipulation** toolbar.

The translation tool is displayed with three colored axes at the correct angles relevant to the current camera position.



3. Use the translation tool to change the position of the selected object:
 - To move the currently selected object, place the mouse over the square at the end of the desired axis. When the cursor changes to , drag the square on the screen to increase/decrease the translation along that axis.
 - To move the object along several axes at the same time, drag the square frame between the desired axes.
 - Dragging the yellow square in the middle of the translation tool enables you to snap this center point to other geometry in the model.


Note:

You can adjust snapping to increase your precision.

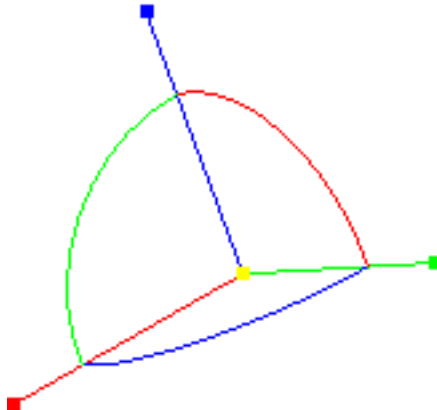
- To move the translation tool itself rather than the selected object, hold down the CTRL key while dragging the square at the end of the desired axis.
- To snap the tool to other objects, hold down the CTRL key while dragging the yellow square in the middle of the tool.
- For the point-to-point translation, hold down the CTRL key, and use the center square to drag the tool to the start point. Then, with CTRL released, drag the square again to move the object to the end point.


Rotating Objects

To rotate an object:

1. Select the object you want to rotate in the main NavisWorks window.
2. Click the **Rotate Item**  button on the **Object Manipulation** toolbar.

The rotation tool is displayed with three colored axes at the correct angles relevant to the current camera position.



3. Use the rotation tool to rotate the selected object:
 - Before you can rotate the selected objects, you need to position the origin (center point) of the rotation. To do this, place the mouse over the square at the end of the desired axis. When the cursor changes to , drag the square on the screen to increase/decrease the translation along that axis. This will move the rotation tool itself.
 - Dragging the yellow square in the middle of the rotation tool enables you to move it around, and snap it to points on other geometry objects.


Note:

You can adjust snapping to increase your precision.

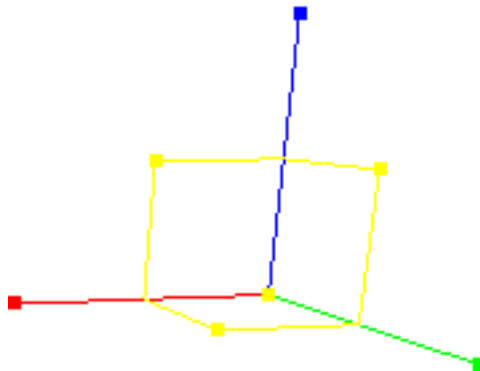
- Once the rotation tool is positioned correctly, place the mouse over one of the curves in the middle, and drag it on the screen to rotate the object. The curves are color-coded, and match the color of the axis used to rotate the object around. So, for example, dragging the blue curve between the X and Y axes, rotates the object around the blue Z axis.
- To rotate the orientation of the rotation tool to an arbitrary position, hold down the CTRL key while dragging one of the three curves in the middle.
- To snap the tool to other objects, hold the CTRL key while dragging the yellow square in the middle of the tool.


Scaling Objects

To change an object's size:

1. Select the object you want to scale in the main NavisWorks window.
2. Click the **Scale Item**  button on the **Object Manipulation** toolbar.

The scale tool displays three colored axes at the correct angles relevant to the current camera position.




3. Use the scale tool to resize the selected object:
 - To resize the selected object, place the mouse over one of seven squares. When the cursor changes to , drag the square on the screen to modify the size of the object. Typically, dragging a square up or right increases the size, dragging it down or left decreases the size.
 - To resize the object across a single axis only, use colored squares at the end of the axes. To

resize the object across two axes at the same time, use yellow squares in the middle of the axes. Finally, to resize the object across all three axes at the same time, use the square in the center of the tool.

- You can modify the center of scaling. To do this, place the mouse over the square in the middle of the tool, and hold down the CTRL key while dragging the square on the screen.


Changing Color

To change an object's color:

1. Select the object you want to modify in the main NavisWorks window.
2. Click the **Modify Item Color**  button on the **Object Manipulation** toolbar, and choose the desired color.

Changing Transparency

To change an object's transparency:

1. Select the object you want to modify in the main NavisWorks window.
2. Click the **Modify Item Transparency**  button on the **Object Manipulation** toolbar.
3. Use the slider to adjust how transparent or opaque the selected object is.

Using the Manual Entry Boxes

The manual entry boxes enable you to translate, rotate, and scale geometry objects by typing in numerical values, instead of using the visual tools in the main NavisWorks window. The boxes are context-sensitive, and change depending on the currently selected manipulation tool.

- Translation:

X, Y, Z represent translation distance in the current model unit, and cX, cY, cZ represent the translation center point.


- Rotation:

X, Y, Z represent degrees of rotation around that axis, and cX, cY, cZ represent the rotation center

point.

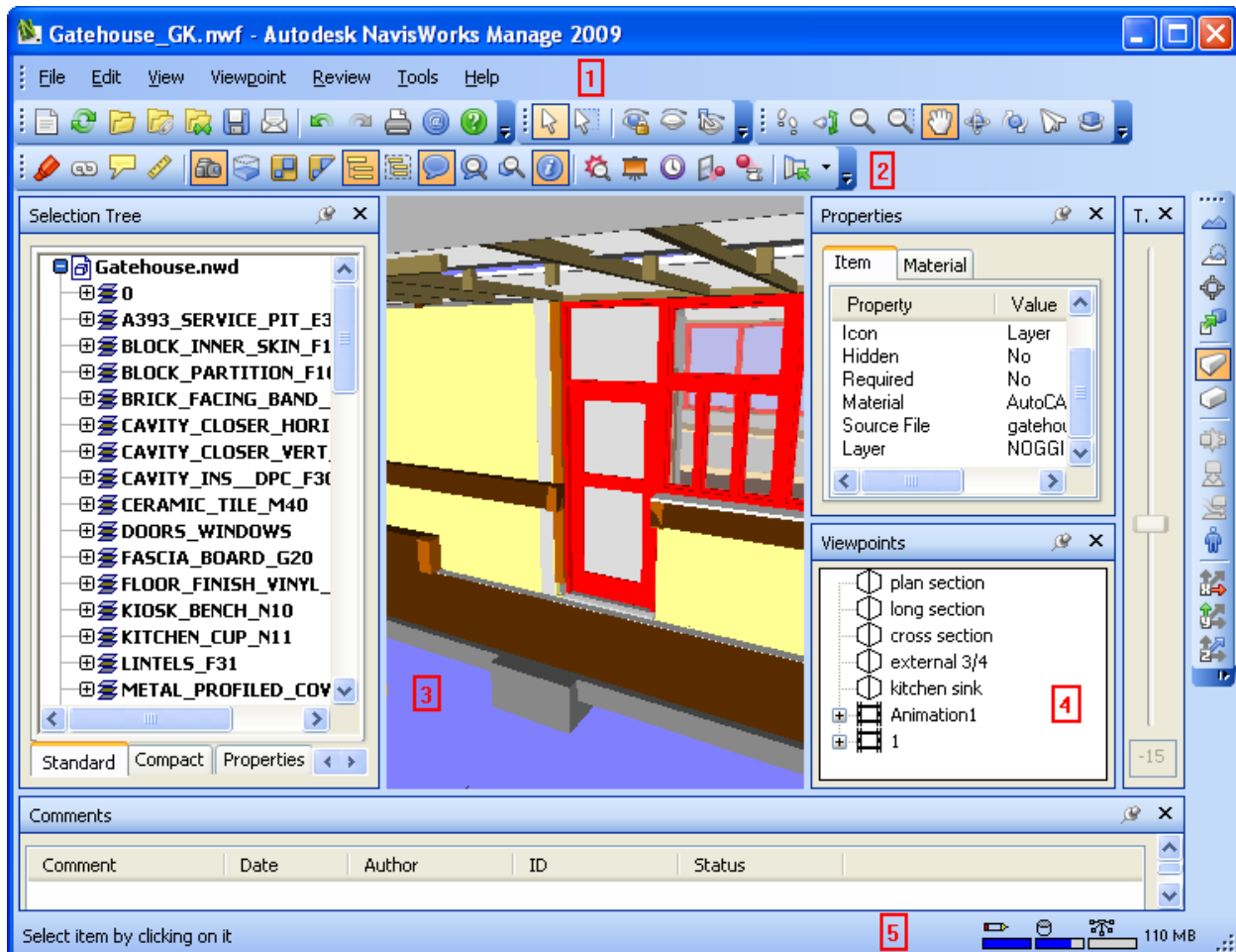
- Scaling:

X, Y, Z represent a scaling factor (1 being the current size, 0.5 half, 2 being double, and so on), and cX, cY, cZ represent the scaling center point.

So, for example, selecting , and typing some numbers into the Manual Entry boxes will move the object along the axis by the amount entered.

Chapter 22. Interface

The NavisWorks interface is intuitive and easy to learn and use. It contains a number of traditional Windows elements, such as toolbars, control bars, dialog boxes, shortcut menus and so on.



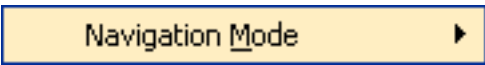
- 1 - Menu bar
- 2 - Toolbars
- 3 - Navigation window
- 4 - Control bars
- 5 - Status bar


The Main Interface Components

This section briefly describes the main interface components.

The Menu Bar

The **Menu** bar contains all commands available in NavisWorks, grouped together by similar or 'like' functionality. For example, all commands related to review functionality are located under the **Review** menu, all commands related to user assistance are located under the **Help** menu and so on.

When a menu has a right-pointing arrow, such as , there is a submenu associated with that choice.

When a menu item is followed by a series of dots, such as , there is a dialog box associated with that choice.

The Toolbars

NavisWorks toolbars provide quick access to frequently used commands. Every button on a toolbar includes a tooltip, which describes the function the button activates. Placing the mouse over a button displays a brief instruction on how to use this feature in the **Status** bar.

You can rearrange, open and close toolbars:

- To move a toolbar, click the dotted line at the edge of the toolbar, and drag it to a different location.
- To open or close toolbars, right-click an empty area next to the last toolbar on the screen, and choose from the list of available toolbars on the shortcut menu.

In addition to rearranging the existing NavisWorks toolbars, you can customize their appearance and content, and create your own toolbars.

Note:

To quickly personalize a toolbar, click the **Toolbar Options**  button on the right, and click **Add** or **Remove Buttons** on the shortcut menu.

When a NavisWorks toolbar button has a down-pointing arrow, such as , a submenu toolbar is

associated with that choice. Click the triangle to open the menu, and select a specific option. As you move through the menu, additional help is displayed in the **Status** bar. When the option is selected, it becomes the current command and is displayed as a button in the toolbar. To repeat the command, click the button in the toolbar. To choose a different command, click the triangle again.


Some toolbar buttons enable you to choose a program mode. For example, to look around your model, you need to be in look around mode. To rotate the model, you need to be in examine mode and so on. NavisWorks remains in the selected mode until instructed otherwise. To identify the mode you are in, look at the buttons. If a button is highlighted and has a dark blue border around it, the corresponding mode is currently active.



To leave the mode, either click the same button again or choose a different mode.


Some buttons are used to toggle the display of control bars, dialog boxes, and window panes (for

example, the Presenter window, the Animator window etc.). Again, if a button is highlighted and has a dark blue boarder around it, it means that the corresponding display element is currently open.

As you open more toolbars on the screen, or resize the NavisWorks window, the toolbars may get overlapped with each other to reduce the screen clutter. When this happens, some buttons will be hidden under the overlaps. To quickly access the entire set of commands on a toolbar, click the chevron  button at the right end of the toolbar. The remaining commands available for that toolbar will appear.

The Main Navigation Window

The main navigation window (also referred to as 'main NavisWorks window' and 'main 3D navigation view') is used to interact with 3D models.

You can control how much space the main navigation window uses compared to the control bars by moving the  sliders from side to side. Alternatively, you could auto hide the control bars, or switch on full screen mode.

The main navigation window can be split vertically, horizontally, or into four segments. For more information, see “ [Splitting the Main View](#) ”.

Right-clicking in the main navigation window displays a shortcut menu of available commands. If you right-click a single item, or select one or more items and right-click, this menu contains commands related to the items. If you right-click an area that contains no items or data, the menu contains commands related to the main navigation window.

The Control Bars

Most features are accessible from the control bars (also referred to as 'palettes'). To display a control bar, click **View > Control Bars** on the menu bar, and then choose from the list of available control bars. Alternatively, click the desired control bar button on the **Workspace** toolbar.

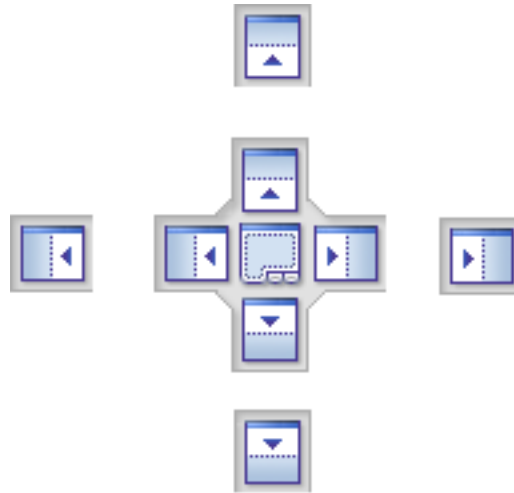
All control bars are dockable and resizable, and will automatically lock to specific locations near to where they are moved.

Note:

Holding down the CTRL key when moving a control bar prevents it from auto docking.

Using the Docking Tool

When you drag a control bar or a window pane from its current location towards a new destination on the interface, a docking tool appears.



The docking stickers point towards the four edges of the interface.



When the control bar you are dragging is close to the place where you want it to dock, move the mouse over the corresponding area of the docking tool. You will see an outline of the control bar appear on the interface. To dock the control bar there, release the mouse button.

Tiling Control Bars

You can tile control bars and window panes on the interface. To do this, drag a control bar you want to tile over the control bar where you want it to be placed. When a rectangular outline appears, release the mouse button.

Auto Hiding Control Bars

You can **auto hide** control bars and window panes; this keeps the control bars active while maximizing the amount of available screen space. If auto-hide is active, the body of the control bar disappears when you move the cursor out of it, leaving only the title bar visible. Move the cursor over the title bar to display the entire control bar again.

To switch auto-hide on, click  on the title bar. To switch auto-hide off, click  on the title bar.

The Shortcut Menu

Right-clicking a control bar displays a shortcut menu of available commands. If you right-click a single item, or select one or more items and right-click, this menu contains commands related to the items. If you right-click an area that contains no items or data, the menu contains commands related to the control bar.

The Status Bar

The **Status** bar appears at the bottom of the NavisWorks screen. As this is not a toolbar, it cannot be customized or moved around.

The left-hand corner of the **Status** bar is used to display short instructions on how to use the NavisWorks features.

In the right-hand corner of the **Status** bar there are four performance indicators, that give you constant

feedback as to how NavisWorks is performing on your machine.



- The progress bar under the left hand icon (pencil) indicates how much of the current view is drawn, i.e. how much drop-out there is in the current viewpoint. When the progress bar is at 100%, the scene is completely drawn, with no drop-out. The icon will change color when it is working. Whilst the scene is being drawn, the pencil will change to yellow. If there is too much data to handle and your machine cannot process this quickly enough for NavisWorks, then the pencil will change to red, indicating a bottleneck.
- The progress bar under the central icon (disk) indicates how much of the current model is loaded from disk, i.e. how much is loaded into memory. When the progress bar is at 100%, the entire model, including geometry and property information, is loaded into memory. The icon will change color when it is working. Whilst data is being read, the disk will change to yellow. If there is too much data to handle and your machine cannot process this quickly enough for NavisWorks, then the disk will change to red, indicating a bottleneck.
- The progress bar under the right hand icon (web server) indicates how much of the current model is downloaded, i.e. how much has been downloaded from a web server. When the progress bar is at 100 %, the entire model has been downloaded. The icon will change color when it is working. Whilst data is being downloaded, the web server will change to yellow. If there is too much data to handle and your machine cannot process this quickly enough for NavisWorks, then the web server will change to red, indicating a bottleneck.
- The field to the right of the icons reports the amount of memory currently being used by NavisWorks. This is reported in Megabytes (MB).

View Menu

The **View** menu gives you control over the NavisWorks interface. It allows you to hide or reveal control bars, use workspaces, and split the current view into several smaller views. It also allows you to display statistics about the currently loaded scene.

The **View** menu includes the following items:

- Control Bars
- Workspaces
- Split Vertical
- Split Horizontal
- Toggle Title Bars
- Full Screen
- Window Size
- Stereo
- Stereo Options

- Scene Statistics

Control Bars

To display a control bar:


- On the **View** menu, click **Control Bars**, and click one of the following:
Camera Tilt, Plan Thumbnail, Section Thumbnail, Viewpoints, Selection Tree, Selection Sets, Find Items, Comments, Find Comments, or Properties.

Alternatively, use the buttons on the **Workspace** toolbar.

Workspaces

NavisWorks comes with several default workspaces. You can use these workspaces as-is or modify them in accordance to your requirements.

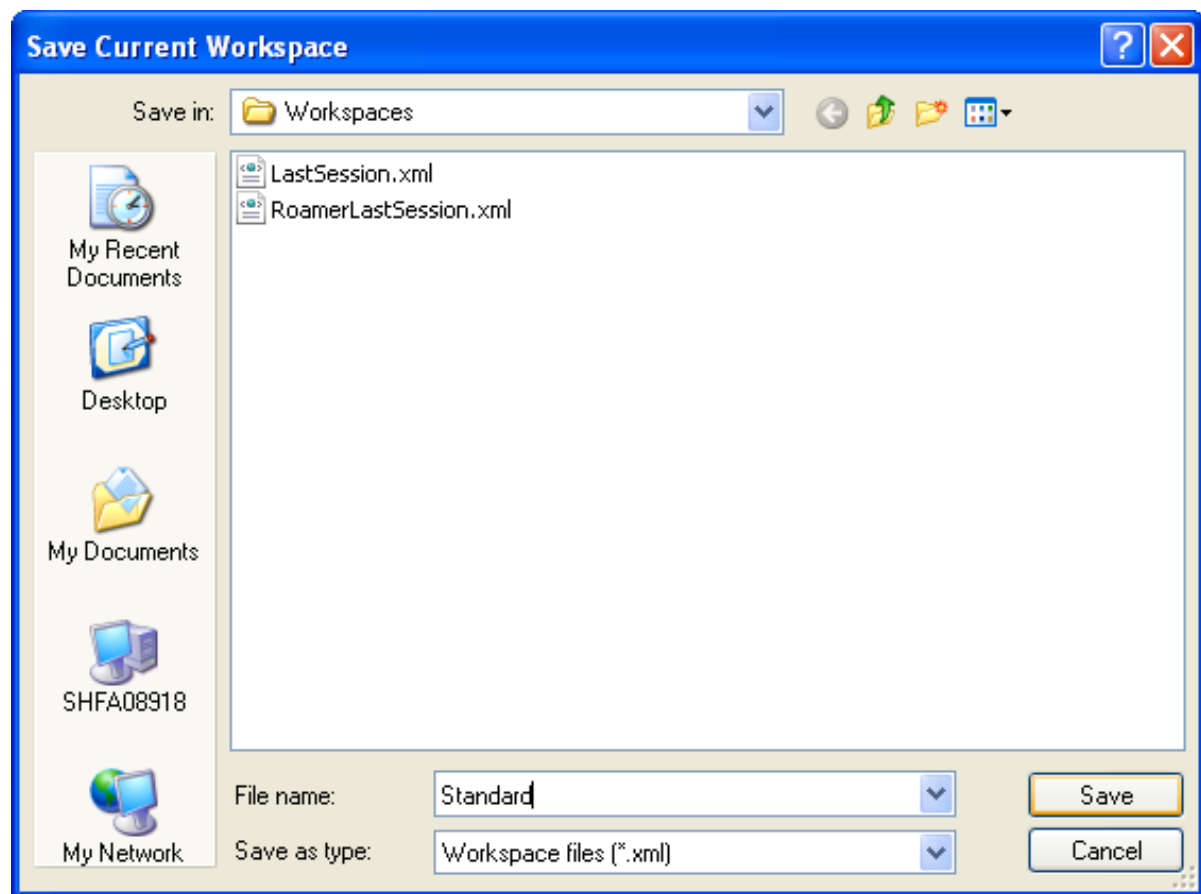
Workspaces enable you to work in a custom, task-oriented design review environment. Each workspace contains sets of toolbars and control bars with the tools required to perform a certain job, making it easy to switch between layouts as necessary. For example, 'file aggregation', 'project review', 'object animation' and 'Clash Detective' workspaces could be set up, saved and used as appropriate. The workspaces can also be shared with other users. You could, for example, create separate workspaces for occasional and 'heavy-weight' NavisWorks users, or setup your own corporate standard.

When you first start NavisWorks a default workspace is used. You can choose a different workspace at any time by clicking **View > Workspaces**, and then selecting the required workspace from the list. Alternatively, click  on the **Workspace** toolbar, and click the desired workspace to open it.



To save the current interface layout to a new workspace:

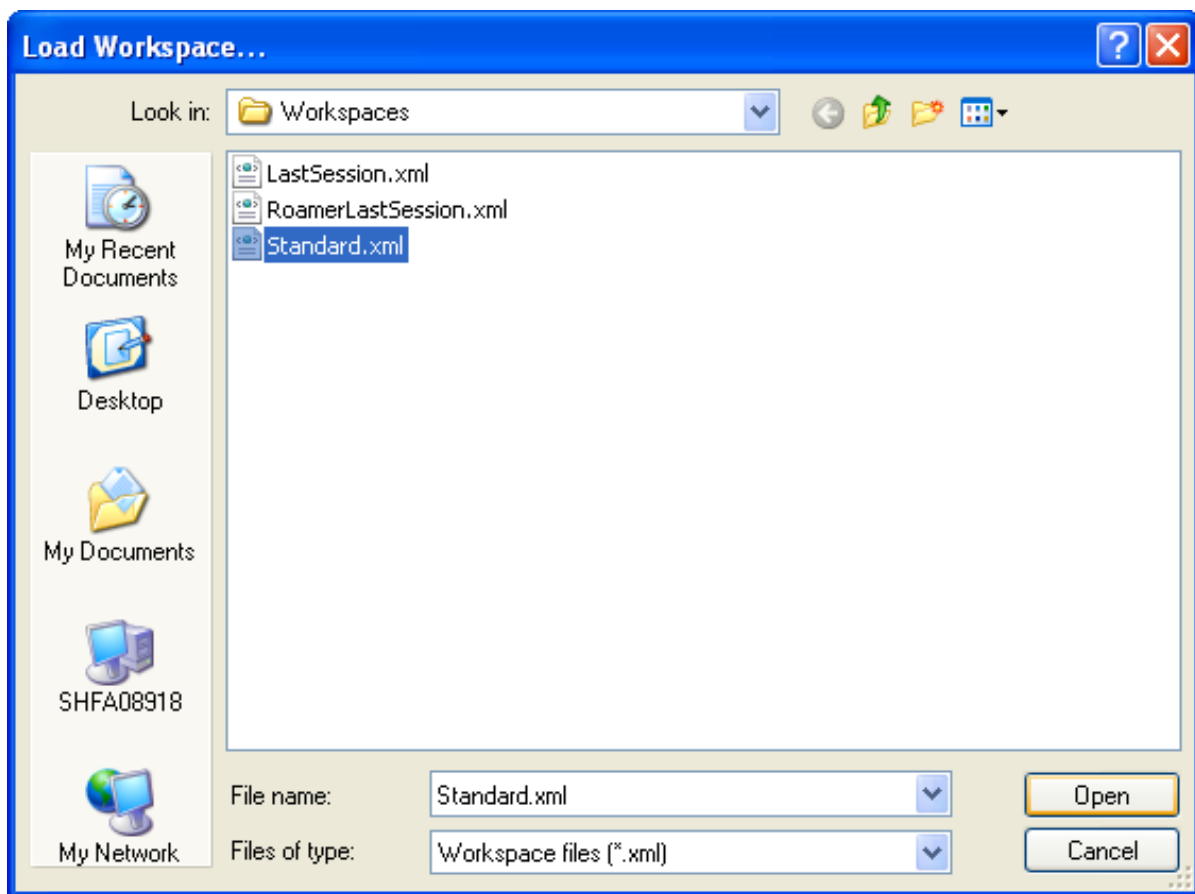
1. Configure your workspace. For example, you can close all toolbars except the **Standard**, **Selection Tools**, **Navigation Mode**, and **Workspace**.
2. On the **View** menu, click **Workspaces > Save Workspace**.
3. In the **Save Current Workspace** dialog box, enter a name for the new workspace. You can also select the name of an existing workspace to overwrite it with your modified configuration.



4. Click **Save**.

To load a saved workspace into NavisWorks:

1. On the **View** menu, click **Workspaces > Load Workspace**.
2. In the **Load Workspace** dialog box, browse to the folder containing the workspace, select the workspace, and click **Open**.



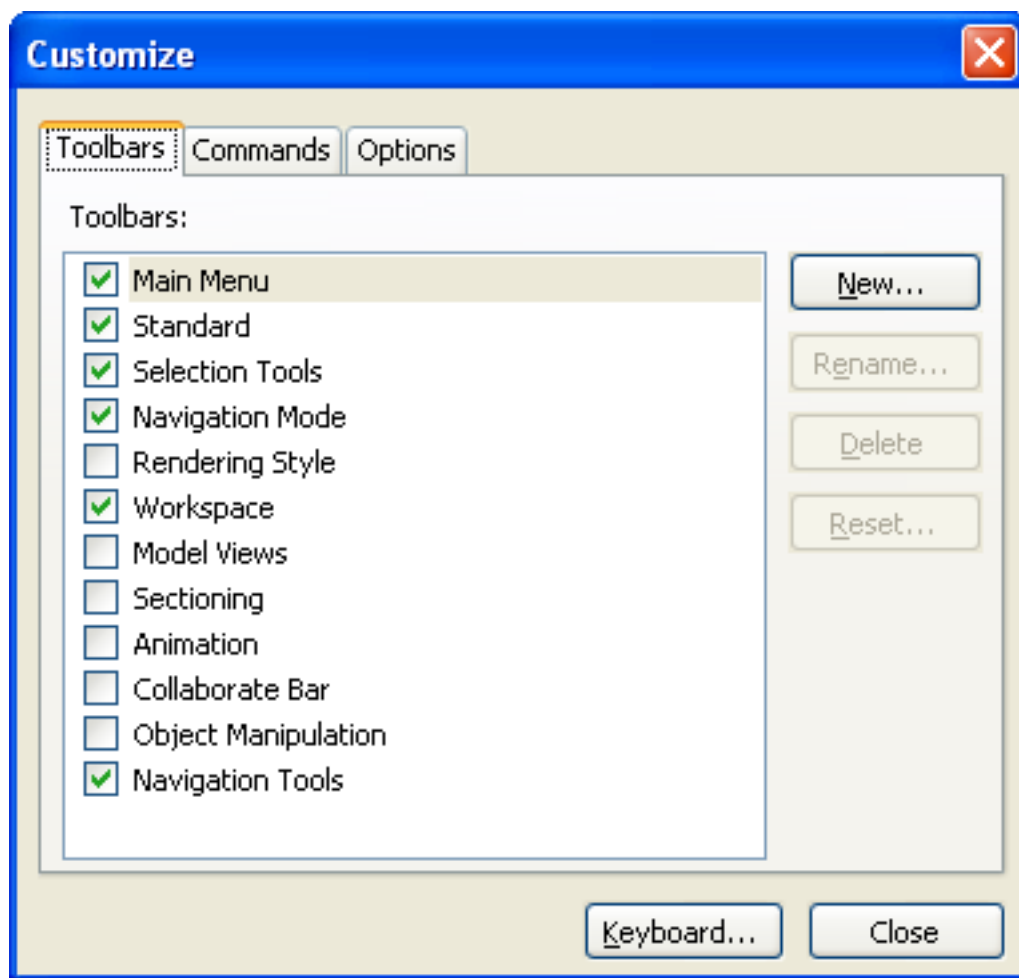
Customizing Toolbars

You can customize appearance and contents of the NavisWorks toolbars by using the **Customize** dialog box.

To open the Customize dialog box:

- Right-click any toolbar on the screen, and click **Customize** on the shortcut menu.
- or
- On the **Tools** menu, click **Customize**.

The **Customize** dialog box is displayed.



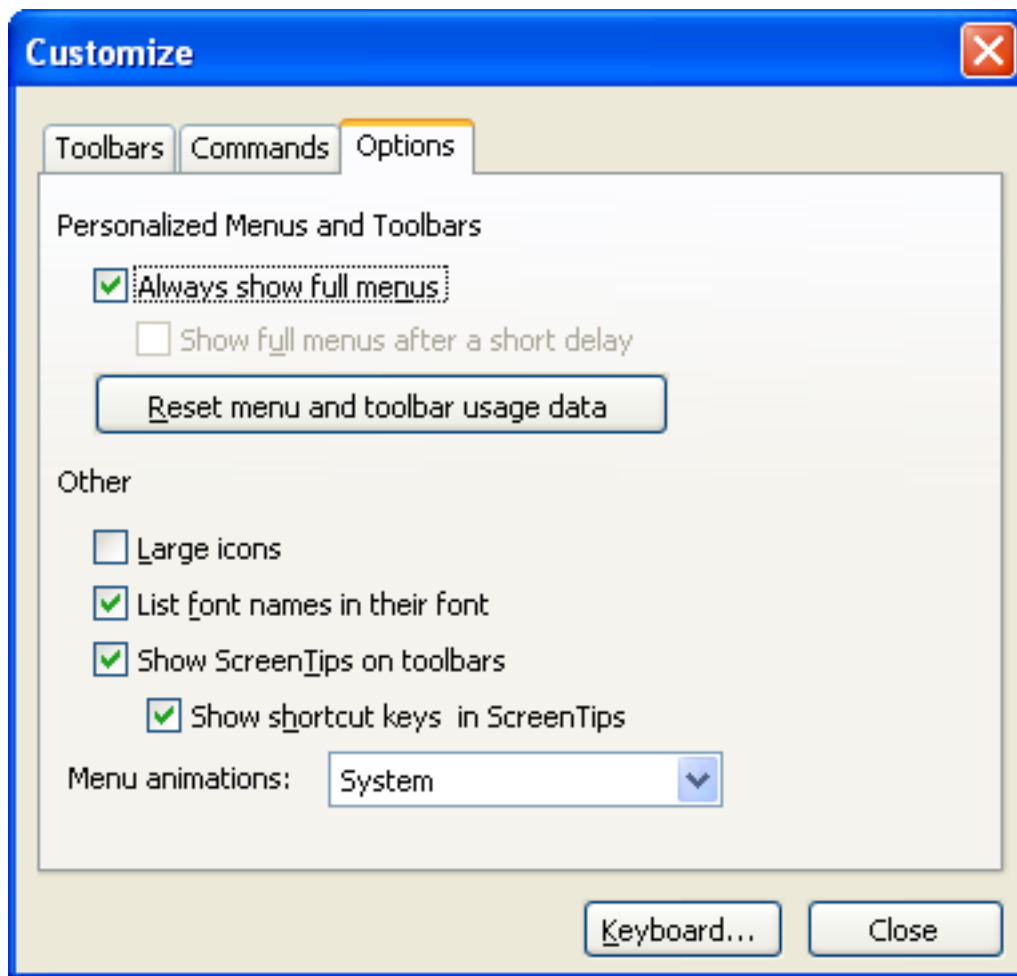
This dialog box has the following purposes:

- Displaying/hiding toolbars. On the **Toolbars** tab, select the check box in front of a toolbar's name to display it. Clear the check box to hide the toolbar.
- Changing appearance of toolbars and menus.
- Changing contents of toolbars and menus.
- Customizing keyboard shortcuts.

Personalizing Appearance of Toolbars and Menus

To personalize appearance of toolbars and menus:

1. In the **Customize** dialog box, click the **Options** tab.



2. By default, the NavisWorks menus display all commands. If you want to show only basic and frequently used commands on short versions of the menus, clear the **Always Show Full Menus** check box.

If you want to show all commands on the menu after a brief delay when you rest the mouse pointer on an open menu, select the **Show Full Menus After a Short Delay** check box.

3. Click **Large Icons** to toggle the size of the toolbar buttons.
4. Click **List Font Names in Their Font** to toggle the way the font names are shown in font lists.
5. Click **Show ScreenTips on Toolbars** to toggle the display of tooltips when the mouse is over a toolbar button.

If the tooltips are on, you can click **Show Shortcut Keys in Screen Tips** to toggle the display of shortcut keys in tooltips.

6. To modify the way menus are animated, click the drop-down button in the **Menu Animations** field, and select one of the options.
7. Optionally, click the **Reset Menu and Toolbar Usage Data** button to restore default settings.
8. Close the dialog box.

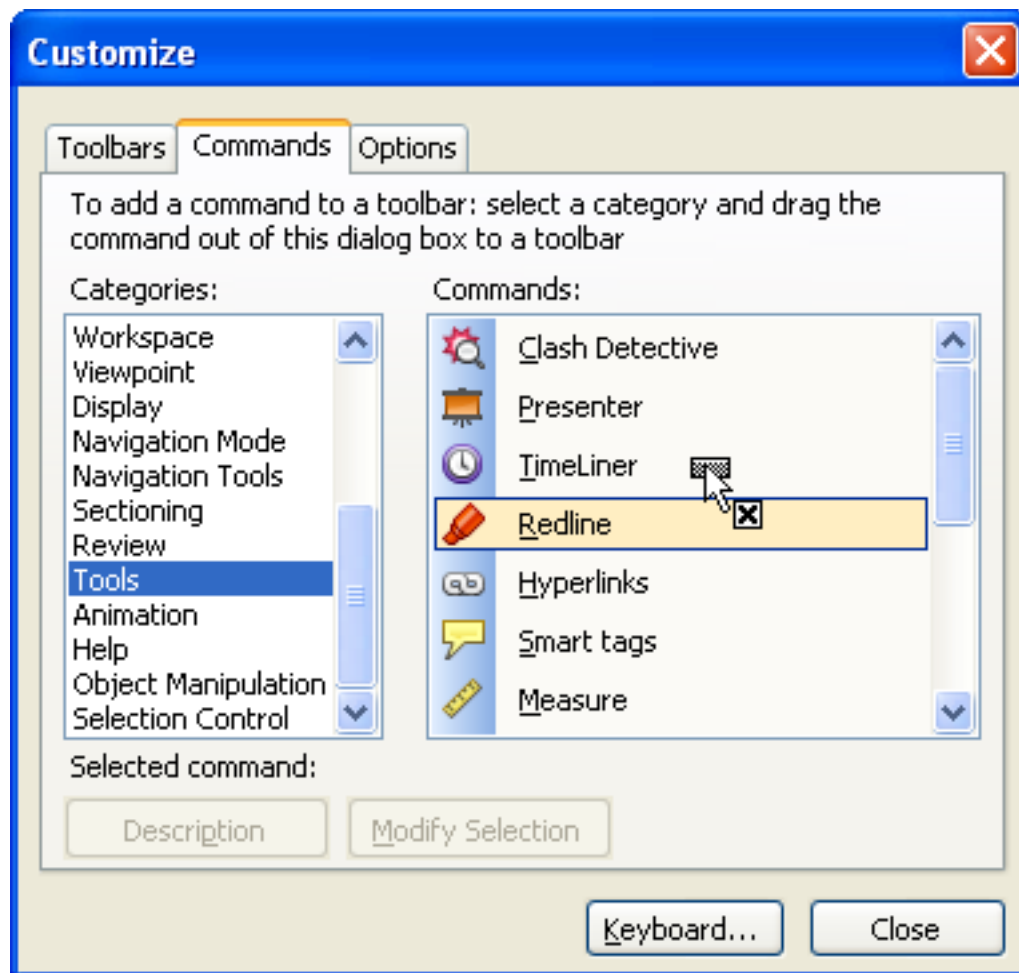
Changing Toolbar and Menu Contents

Note:

You cannot use the procedures below to add/remove commands from shortcut menus.

To add commands:

1. In the **Customize** dialog box, click the **Commands** tab.
2. In the **Categories** field, click the group of commands you want to rearrange, for example 'Tools'.



3. Drag the command from the **Commands** field to the desired location. You can either place it on one of the NavisWorks toolbars or inside one of the menus on the menu bar.

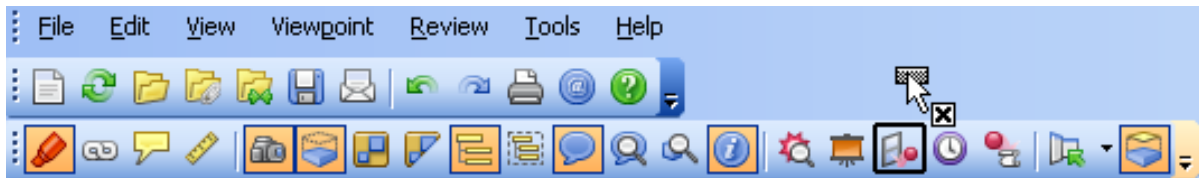
Once you've dropped the command onto a toolbar or a menu, clicking the **Description** button gives you more information about it.

4. If you want to edit the command's appearance, click the **Modify Selection** button, and then click the required option on the shortcut menu:

- **Reset** - resets the selected command to its default appearance.
 - **Delete** - deletes the selected command.
 - **Name** - specifies the name of the command. Place & (ampersand) in front of a letter you want to use as a keyboard shortcut. Pressing ALT together with this letter will activate the command.
 - **Default Style** - uses the default style for the command.
 - **Text Only** - the command is shown as text (as it's entered in the **Name** field).
 - **Image and Text** - the command will use both text and image.
 - **Begin a Group** - adds a separator to the left of the command if it's added to a toolbar, or above the command, if it's added to a menu.
5. Close the dialog box.

To delete commands:

1. Open the **Customize** dialog box.
2. Drag the command you want to remove from a menu or a toolbar until a cursor displays a small cross.



3. Release the left mouse button to delete the command.
4. Close the dialog box.

To edit commands:

1. Open the **Customize** dialog box.
2. Select the command on a menu or on a toolbar.
3. To change the command's position, simply drag it to a new place.
4. To change the command's appearance:

In the **Customize** dialog box, click the **Commands** tab.

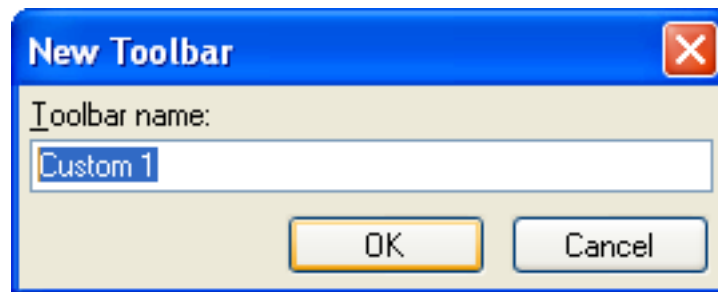
Click the **Modify Selection** button, and click the desired option on the shortcut menu.

5. Close the dialog box.

To add a custom toolbar:

1. In the **Customize** dialog box, click the **Toolbars** tab.
2. Click the **New** button.

The **New Toolbar** dialog box is displayed.



3. Enter a name for the toolbar in the **Toolbar Name** field and click **OK**. By default, new toolbars are named "Custom X" where 'X' is the next available number added to the list.

If you need a more descriptive name, you can rename your toolbar later by clicking the **Rename** button.

4. In the **Customize** dialog box, click the **Commands** tab, and drag the desired commands to your new toolbar. Alternatively, you can simply drag commands from other menus and toolbars.
5. Close the dialog box.

To delete a custom toolbar:

1. In the **Customize** dialog box, click the **Toolbars** tab.
2. Select the toolbar you don't need, and press the **Delete** button.
3. Close the dialog box.

Customizing Keyboard Shortcuts

To customize keyboard shortcuts:

1. In the **Customize** dialog box, click the **Toolbars** tab.
2. Click the **Keyboard** button.

The **Customize Keyboard** dialog box is displayed.



3. In the **Categories** field, click the group that contains the command to which you want to assign a shortcut.
4. In the **Commands** field, click the actual command.
If the command has a shortcut assigned to it, it is displayed in the **Current Shortcut** field.
5. In the **Select a New Shortcut** drop-down list, click the shortcut key combination you want to use.
6. Click the **Assign** button.

Note:

Clicking **Remove** removes the shortcut assignment for the selected command, and clicking **Reset All** restores the default shortcut assignments.

7. Close the dialog box.

Workspace Toolbar

The **Workspace** toolbar gives you control over the NavisWorks interface. You can personalize this toolbar, if you want.



Redline



Hyperlinks



Smart Tags



Measure



Viewpoints



Sectioning



Plan Thumbnail



Section Thumbnail



Selection Tree



Selection Sets



Comments



Find Comments



Find Items



Properties



Workspaces

Customizing the Main Window

You can split the main scene into a number of segments, each of which can be navigated separately. You may find this useful when comparing lighting and rendering styles, or animating different parts of your model etc.

You can also adjust the size of the main window, or view the model in full screen mode.

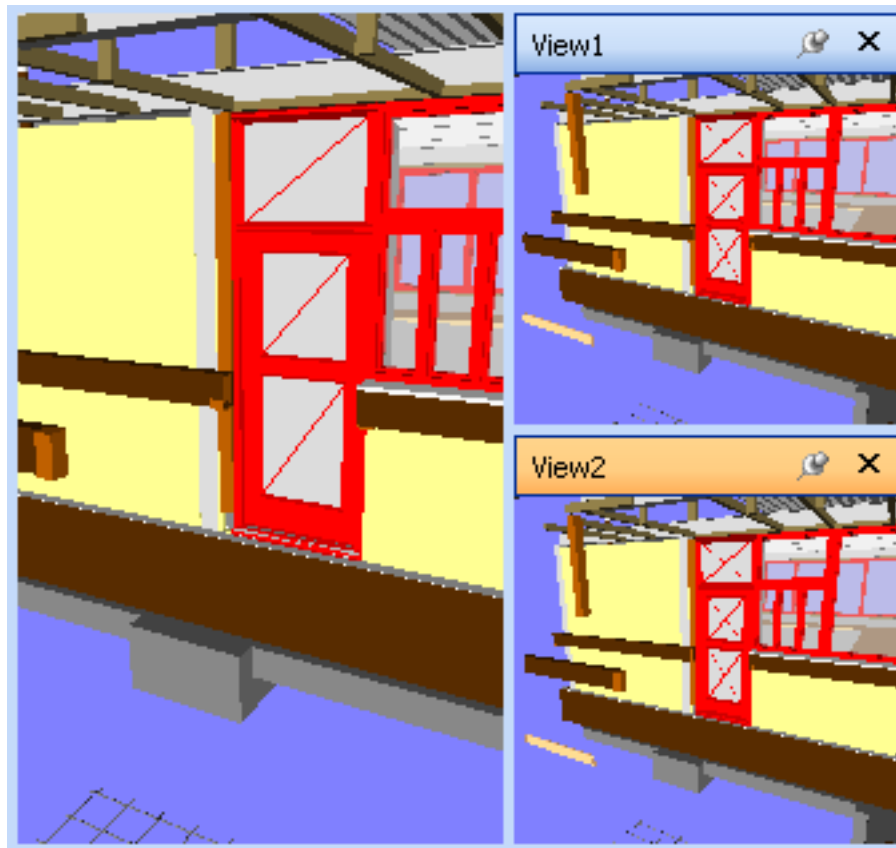
Splitting the Main View

You can look at several views of your model simultaneously by splitting the main NavisWorks window.

To create a view and make it dockable:

1. To split your current view horizontally, click **View > Split Horizontal** on the menu.
2. To split your current view vertically, click **View > Split Vertical** on the menu.
3. To adjust the default window split, hover the mouse over a vertical or a horizontal dividing line, and drag the black sliders into the desired position.
4. Click **View > Toggle Title Bars** on the menu.

All of your custom views now have title bars. By default, new views are named "ViewX" where 'X' is the next available number.




The view windows with title bars are resizable, and can be docked and auto hidden the same way as control bars.

Note:

The recording and playback of animations will occur in the most recently used view. Each separate view remembers the navigation mode being used.

To delete views:

- To delete views, switch on the title bars, and click  to close each window.

If you need to use different views, but don't want to have any splits in the main NavisWorks window, consider moving your views elsewhere, for example, you can tile them on the **Viewpoints** control bar.

Full Screen Mode

Selecting **Full Screen** or pressing the **F11** key puts NavisWorks into Full Screen mode; the main 3D

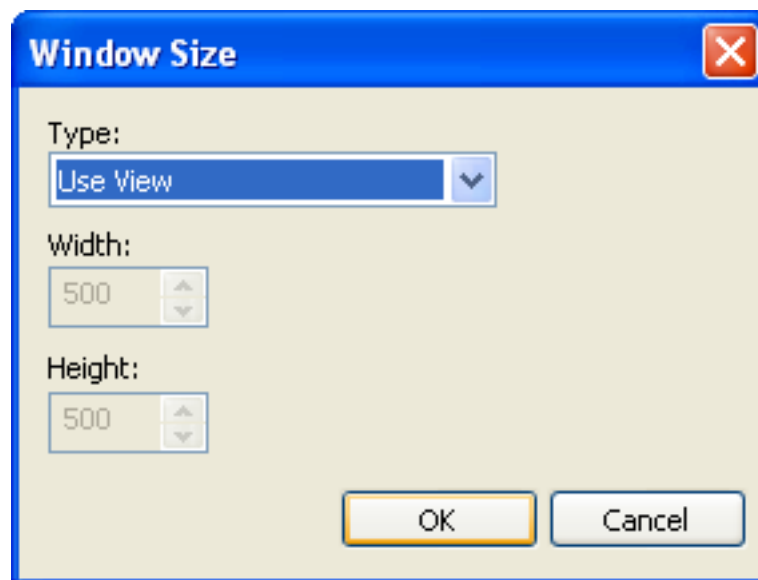
navigation view takes up the full screen with no interface showing. Pressing the **F11** key for a second time turns full-screen mode off. Full screen mode will always go to full screen on the primary display. If two monitors are available, the interface can be placed on one whilst the main 3D view renders in full screen on the other.

Sizing of Navigation Window

NavisWorks allows you to specify the size of the main navigation window. This can be of particular use if you are composing a scene for image or animation export. By setting the window size to the same proportions as your intended output, you can visualize exactly how it will result.

Explicit sizing of the main navigation window:

1. On the **View** menu, click **Window Size**. The **Window Size** dialog box is displayed.



2. From the **Type** drop-down list, select the sizing type you wish to specify:
 - Select **Use View** to maximise the window size.

Or

 - Select **Explicit** and enter the exact width and height you wish the window to be.

Or

 - Select **Use Aspect Ratio** and enter the height you require and the width will be automatically calculated from the aspect ratio of the current view.
3. Click **OK** to set the window size, or **Cancel** to return to NavisWorks without changing it.

Stereo Rendering

Stereoscopic viewing in NavisWorks allows the viewing of the 3D model through stereo-enabled hardware, including active and passive stereo viewing glasses in conjunction with both CRT screens and dedicated projectors.

This feature requires the host computer have an OpenGL graphics card with stereo support. If this hardware is available, and has the correct driver and display settings, stereo can be turned on by selecting the **View, Stereo** menu option, otherwise this option will be greyed-out.

Note:

Some drivers require stereo to be explicitly enabled in the driver and may require lower color or resolution settings before stereo becomes available.

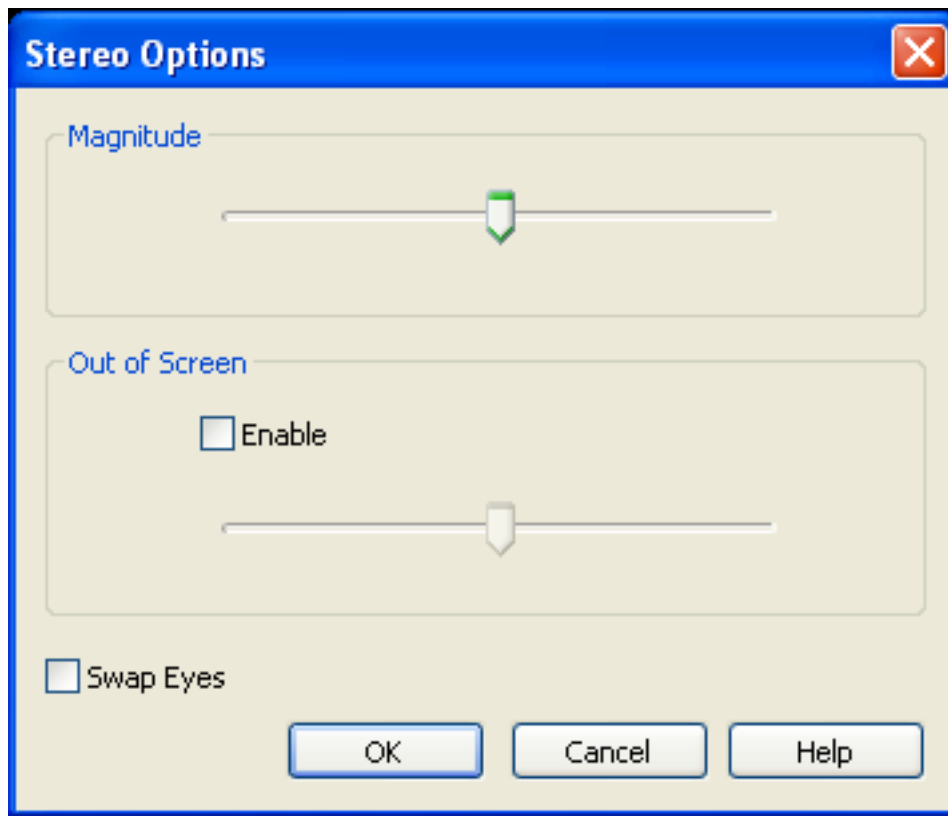
Selecting this menu option puts the video output into stereo mode; the view will look blurred without the correct glasses being worn. If the camera is in orthographic mode, it will need to be set to perspective for the effect to work correctly.

Note:

As the view for each eye has to be rendered separately it is not possible to support incremental filling in of detail in stereo mode. The detail appears when rendering is complete. Progress can be seen using the bar in the status area, and it is still possible to interrupt and start interacting again at any time.

Stereo Options

1. Go to **View, Stereo Options....** The options dialog will be displayed.



2. Slide the **Magnitude** bar to vary the strength of the stereo effect.
3. Sliding the **Out of screen** bar, when enabled, and when using a focal point based navigation mode (examine, orbit, turntable, etc.), will position the model so that parts closer than the focal point appear in front of the screen, with the rest behind. The slider controls the balance, moving objects more or less out of the screen. When using any other navigation mode (walk, fly, etc.), the focal point is set so that any avatar will be level with the screen. Objects between you and the avatar will appear in front of the screen.
4. Check the **Swap Eyes** check box to swap the left and right eyes over. This can be useful when moving from CRT to a large screen projector and back.
5. Click **OK** to set the options or **Cancel** to exit the dialog without setting them.

Scene Statistics

This displays a list of the files contributing to the scene, and the different graphic elements that make up the scene, along with which of these have been processed or ignored when loaded.

Other useful statistics are the bounding box of the entire scene and the total number of primitives (triangles, lines, points) in the scene.

To view scene statistics:

- Go to **View, Scene Statistics** to display all the statistics about the current scene.

The number of each type of element is listed together with which have been ignored or processed in creating the scene.

Units

NavisWorks has the concept of what unit the scene is presented in. This is most useful when measuring items, setting tolerances for clash detection, or sizes of textures. There is a single scene unit that is set from the **Global Options** dialog and this unit is used throughout the interface whenever appropriate.

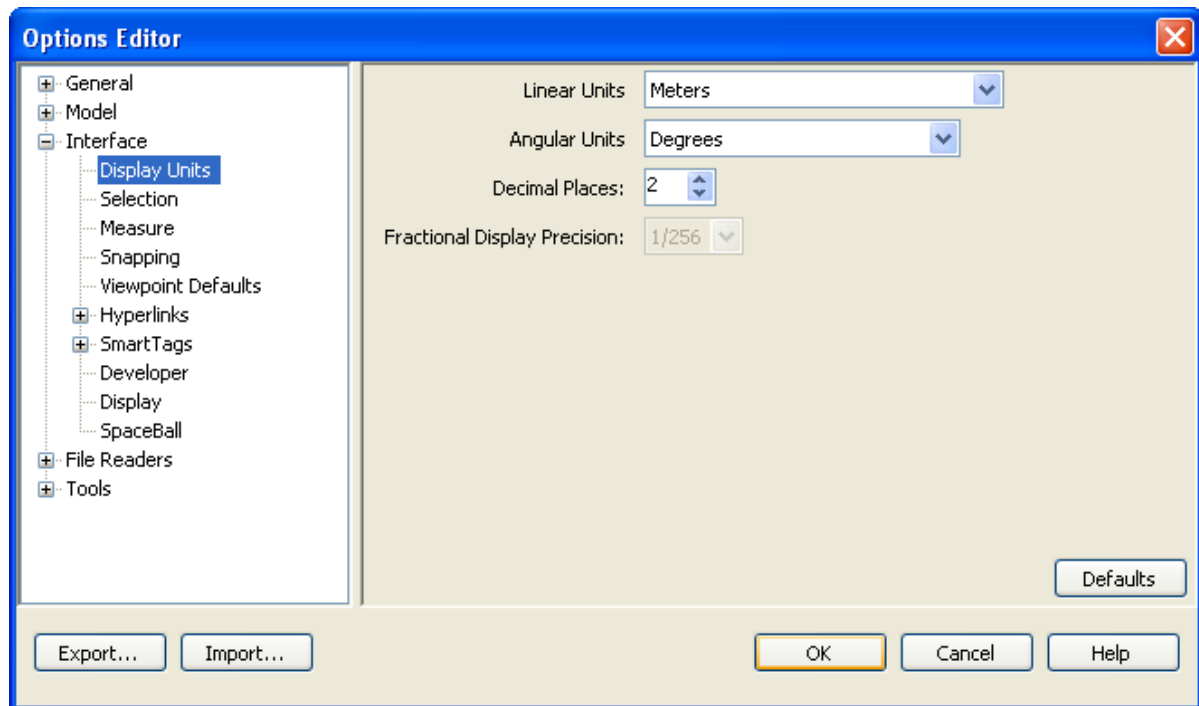
There is a default unit setting for each file type so that when files are opened, they are scaled appropriately to the scene's units. They can, of course, be rescaled after if the units turn out to be wrong for the scene.

Units Options

Setting units options:

1. On the **Tools** menu, click **Global Options**.
2. Expand the **Interface** node in the **Options Editor** dialog box, and click the **Display Units** option.

The Display Units page is displayed.



3. Choose the **Linear Units** from the list. You should be able to choose the exact format you wish.
4. Choose the **Angular Units** from the list.
5. Enter the number of decimal places you want to see throughout the interface for your units in the **Decimal Places** box. If the unit chosen is a fractional unit, rather than decimal unit, then you have

the choice of what level of fraction to display the units from the **Fractional Display Precision** drop-down list.

6. Click **OK** to set the options or **Cancel** to exit the dialog without setting them.

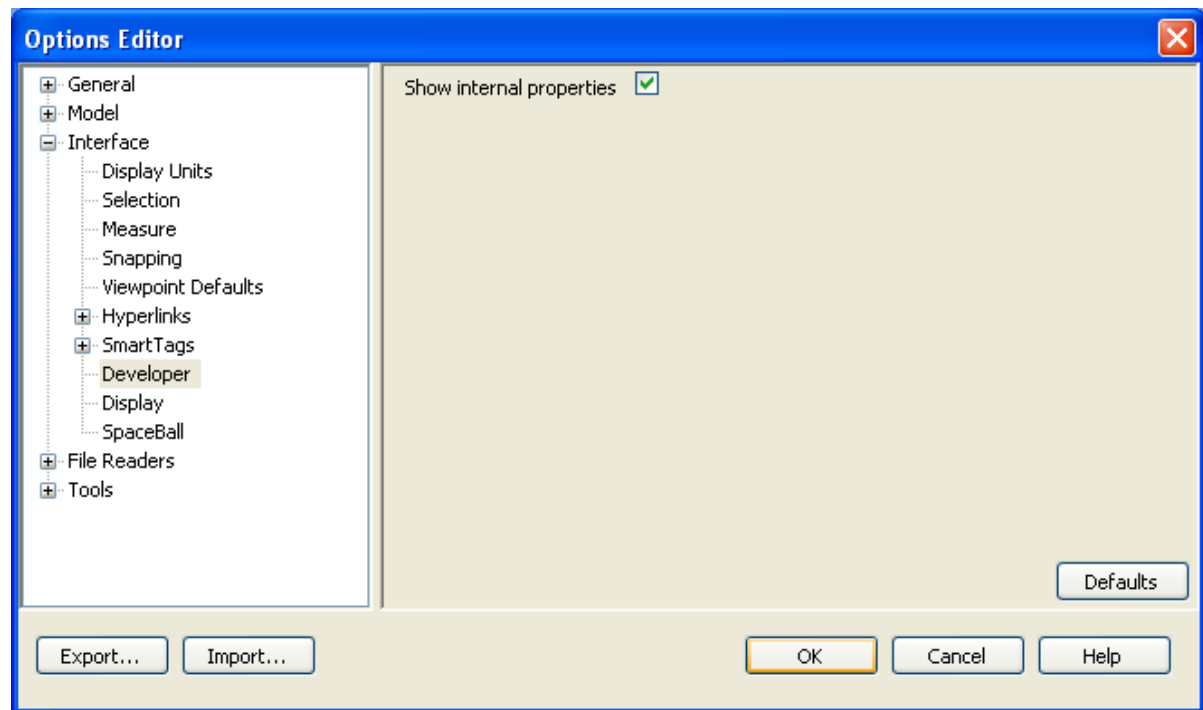
Profiles

NavisWorks can be adjusted to your level of CAD technical knowledge. By default, a standard profile is used. If necessary, you can use a developer profile to display additional object properties.

Using a developer profile:

1. On the **Tools** menu, click **Global Options**.
2. Expand the **Interface** node, and click the **Developer** option.

The Developer page is displayed



3. Select the **Show Internal Properties** check box to display additional object properties.

Note:

Now the **Geometry** tab and **Transform** tab will be shown in the **Properties** control bar for the associated models and items.

4. Click **OK** to set the profile or **Cancel** to exit the dialog box without setting it.

Search Directories

NavisWorks searches for a variety of configuration files in subdirectories of three standard directories. These files can be overridden on a per user, all users or per installation basis. The search directories are :

- Application Data\Autodesk NavisWorks Review 2009 within the current user profile.
Usually C:\Documents and Settings\user\Application Data\Autodesk NavisWorks Review 2009 where user is the name of the current user.
- Application Data\Autodesk NavisWorks Review 2009 within the all users default profile.
Usually C:\Documents and Settings\All Users\Application Data\Autodesk NavisWorks Review 2009.
- Within the NavisWorks install directory. Usually C:\Program Files\Autodesk NavisWorks Review 2009.

Chapter 23. Tools

The **Tools** menu in NavisWorks gives access to a series of useful tools and options.

The **Tools** menu includes the following items:

- TimeLiner Playback
- Compare
- Redline
- Hyperlinks
- Smart Tags
- Measure
- Animation
- Background Color
- File Options
- Customize
- Global Options

Comparing Models

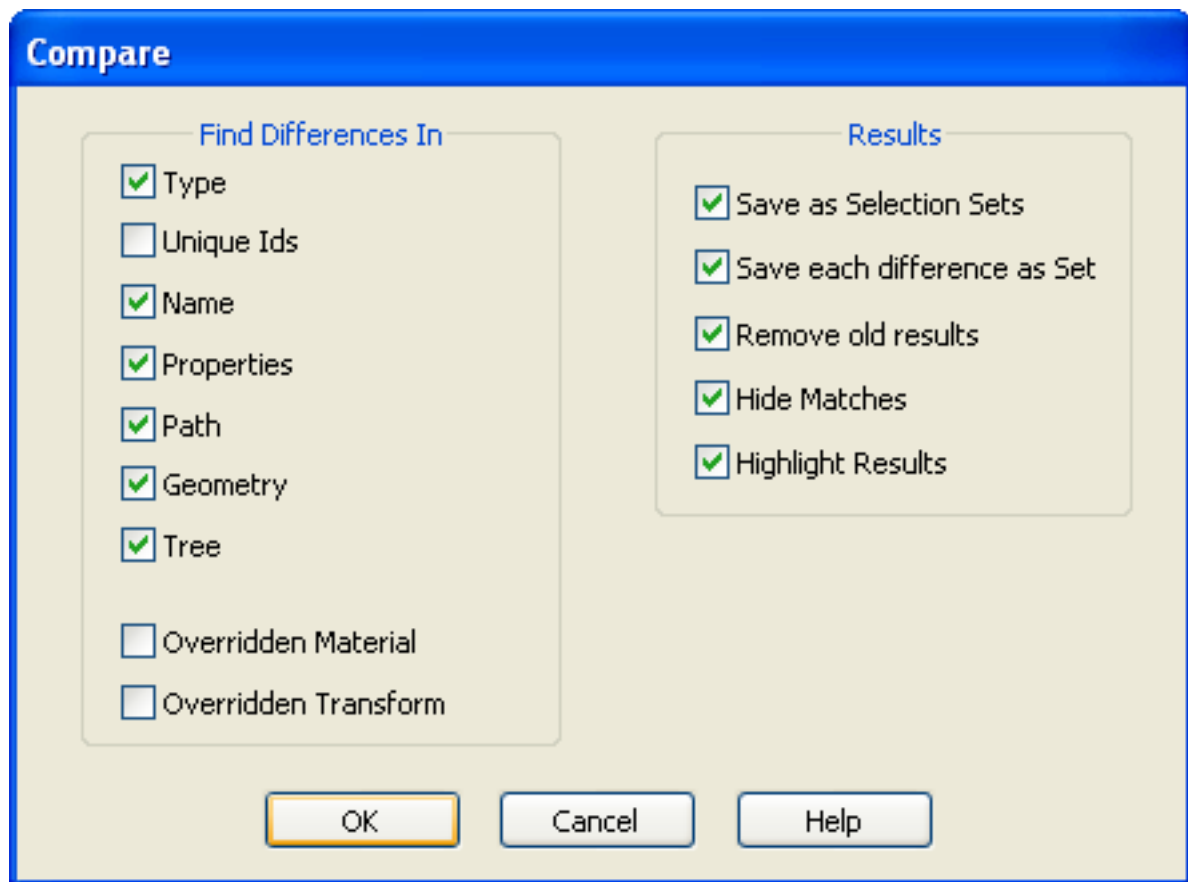
The **Compare** tool becomes available when *exactly* two items are selected. These can be any types of item, but the compare tool is most useful when comparing two versions of the same model. During the comparison, NavisWorks will start at each item and recursively travel down each path, as seen in the standard selection tree, comparing each item it comes across in terms of the criteria requested.

When the comparison has finished, you have the option of saving the differences as Selection Sets with comments describing the differences in more detail.

Comparing two items

1. Select exactly two items in the scene (see [Chapter 13, *Selecting Items*](#) for more information on how to do this).
2. On the **Tools** menu, click **Compare**.

The **Compare** dialog box is displayed.



3. In the **Find Differences In** section of the dialog, check all the boxes of the criteria that you want NavisWorks to compare for differences between the two items. **Overridden Material** and **Overridden Transform** relate to changing the color and/or transparency in NavisWorks and changing a file's origin, scale or rotation since loading into NavisWorks, so these are unchecked by default. All the other criteria relate to properties of items from the original CAD model.
4. Check **Save as selection set** if you want to save the selected items that you are comparing between as a selection set. You can then use this for later comparisons between the same items.
5. Check **Save each difference as set** if you want to save the resulting differences found in the comparison between the two items as a selection set for later analysis. The selection set will also have a comment attached detailing the differences in more depth.
6. Check **Remove old results** if you want to remove any selection sets resulting from a previous comparison, in order to reduce confusion when looking at the results.
7. Check **Hide matches** if you want to hide all items that turn out to be the same in the comparison, when the comparison finishes. To show them again, reset all hidden items.
8. Check **Highlight results** if you want to highlight each resulting difference with a color override, when the comparison finishes. Reset the color using the reset material command.
9. Click **OK** to start the comparison, or **Cancel** to return to NavisWorks without making any comparison. At any time during the comparison, you can click on **Cancel** on the **Exporting** dialog to abort the comparison.

The colors of the resulting highlights are as follows:

- White for items that match;
- Red for differences between items;
- Yellow for things found in the first item that aren't in the second;
- Cyan for things found in the second item that aren't in the first.

Chapter 24. Options

There are two types of options: File Options and Global Options. These are both accessed from the **Tools** menu. File options are saved in NavisWorks files (.nwf or .nwd) and reinstated when opening it. Global options, on the other hand, are set for *all* NavisWorks sessions.

File Options

These options are saved into NavisWorks files and re-loaded when opening these files into NavisWorks. They are predominantly concerned with the appearance of the model and the speed of navigation around it.

To get to the File Options dialog, go to **Tools, File Options**. You will get a tabbed dialog box offering one of the following five file options:

- Culling. See “ [Culling Options](#) ”.
- Orientation. See “ [Orientation Options](#) ”.
- Speed. See “ [Speed Options](#) ”.
- Head light. See “ [Head Light options](#) ”.
- Scene lights. See “ [Scene Lights Options](#) ”.
- DataTools. See “ [Adding Database Links](#) ”.

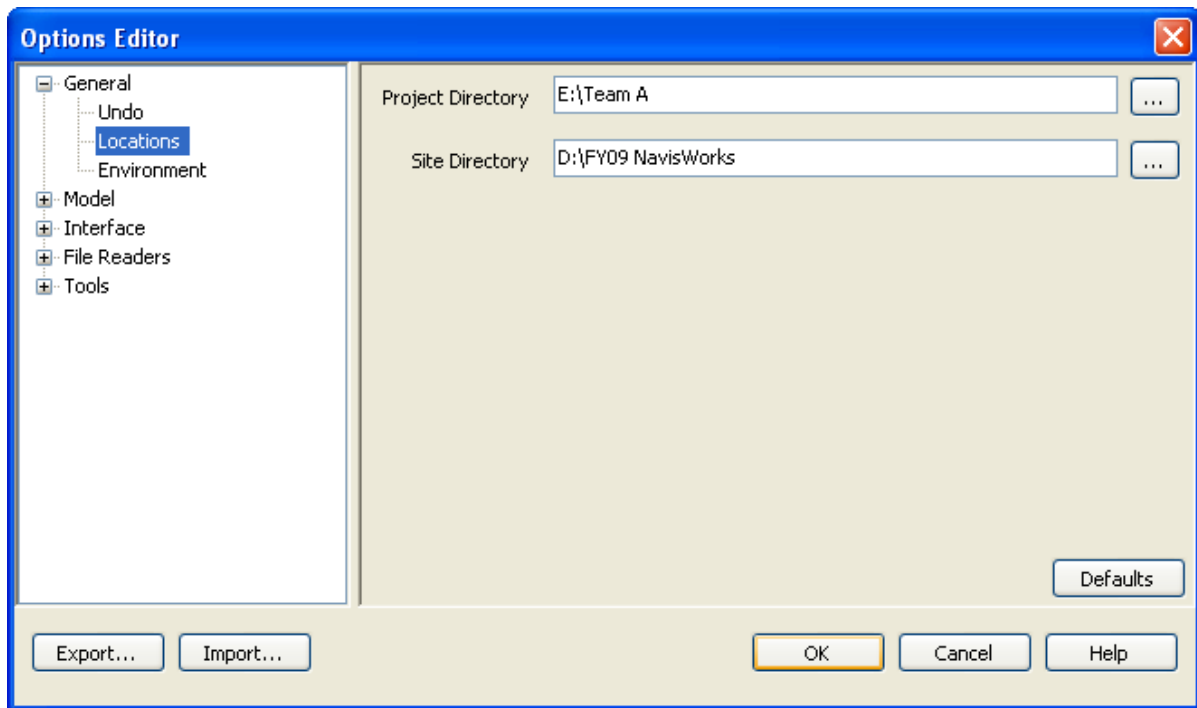
Location Options

These options enable centralized sharing of global NavisWorks settings, workspaces, datatools, avatars, Clash Detective rules, Presenter archives, custom Clash Detective tests, object animation scripts etc. The settings can be shared across an entire project site, or across a specific project group depending on the required level of granularity.

Setting location options:

1. On the **Tools** menu, click **Global Options**.
2. Expand the **General** node in the **Options Editor** dialog box, and click the **Locations** option.

The Locations page is displayed:



3. In the **Project Directory** field, browse to the directory that contains the NavisWorks settings specific to your project group.
4. In the **Site Directory** field, browse to the directory that contains the NavisWorks settings standard across the entire project site.
5. Click **OK** to save the changes or **Cancel** to exit the dialog without saving them.

Note:

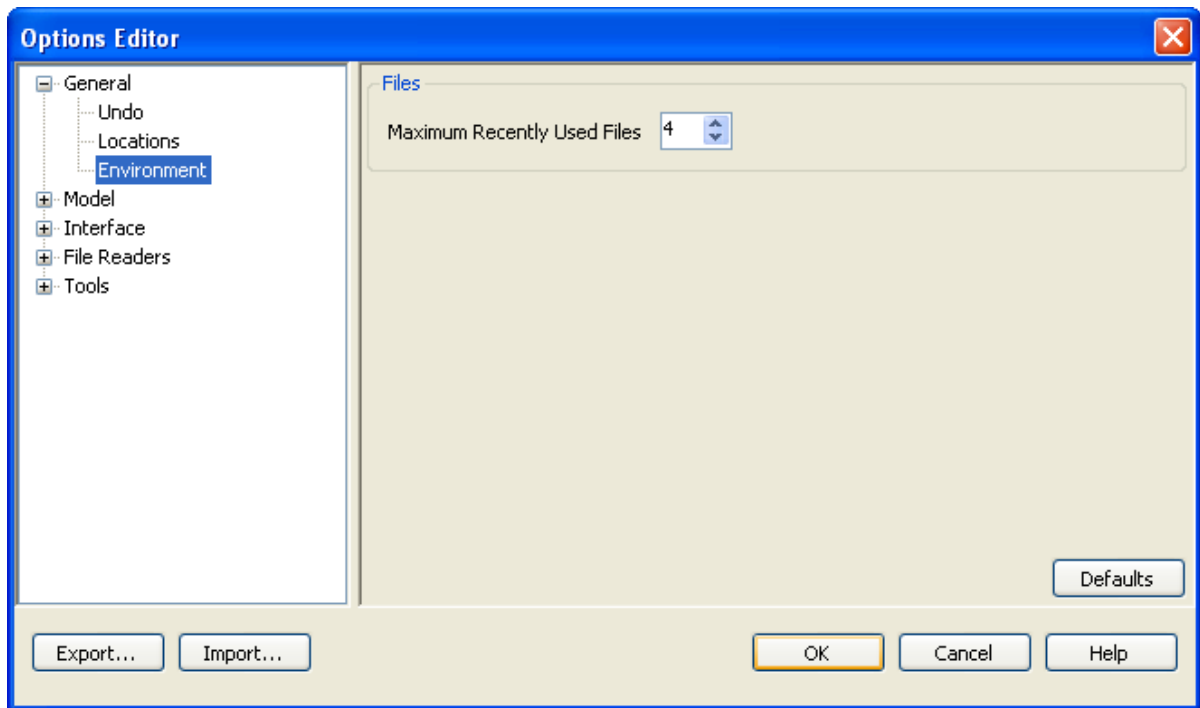
When you run NavisWorks for the first time, the settings are picked up from the installation directory. Subsequently, NavisWorks examines the current user profile and the all users profile on the local machine, and then checks the settings in the **Project** directory and the **Site** directory. The files in the **Project** directory take precedence.

Environment Options

Setting environment options:

1. On the **Tools** menu, click **Global Options**.
2. Expand the **General** node in the **Options Editor** dialog box, and click the **Environment** option.

The Environment page is displayed:

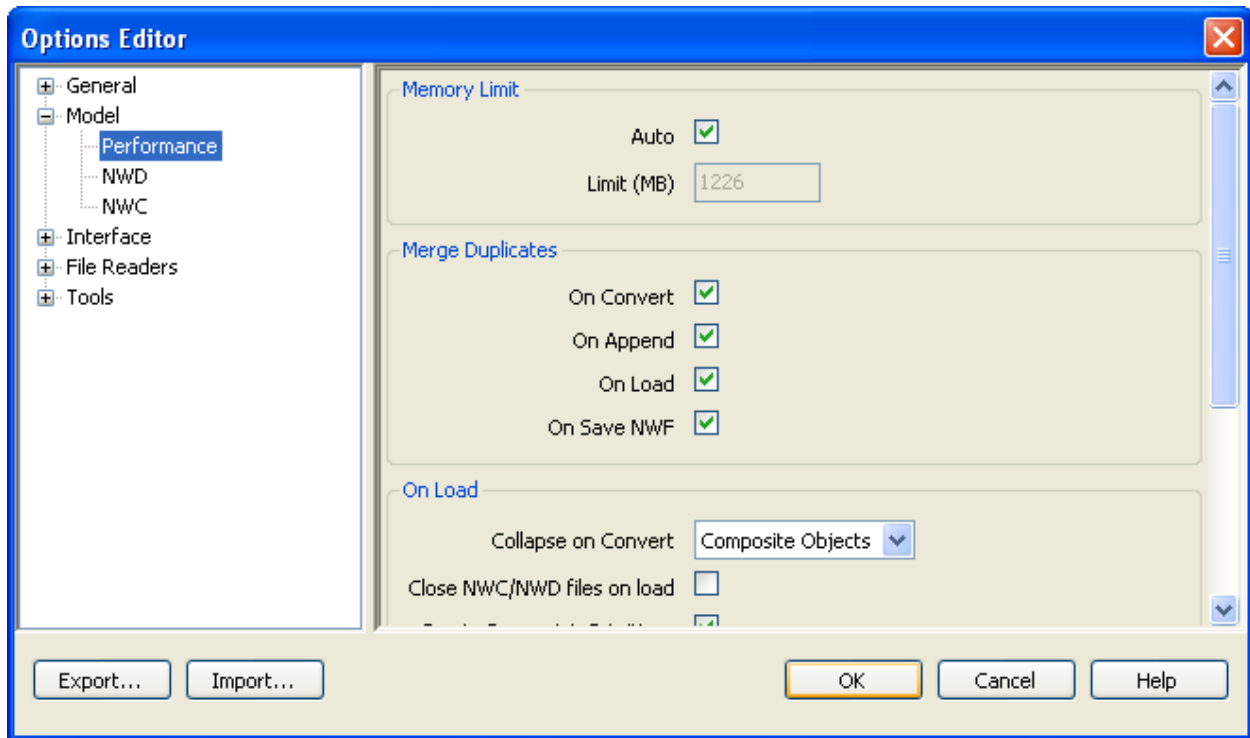


3. Enter the desired number into the **Maximum Recently Used Files** to specify how many file shortcuts NavisWorks can remember. By default, shortcuts to the 4 most recently opened files can be displayed.
4. Click **OK** to save the changes or **Cancel** to exit the dialog without saving them.

Global Options

These options are persistent across NavisWorks sessions and are not saved into NavisWorks files.

The **Options Editor** can be accessed via the **Tools** menu, or it can be launched as a separate application. To do this, go to **Start > Programs > Autodesk > Autodesk NavisWorks Review 2009 > Options Editor**. The options are grouped together, and presented in a tree structure, making it quicker to find and change them.



Options can be exported and imported, making it quick and easy for project managers, or systems administrators, to ensure the NavisWorks settings on all machines are identical.

Configuring Global Options

The options are presented in the dialog box in a hierarchical tree structure. The following categories are available:

- General
- Model
- Interface
- File Readers

General Options

You can configure:

- Buffer Size. See “[Undo Options](#)”.
- File Locations. See “[Location Options](#)”.
- Number of Recent File Shortcuts to Store. See “[Environment Options](#)”.

Model Options

You can configure:

- NavisWorks Performance. See “ [Performance Options](#) ”.
- NWD File Parameters. See “ [NWD Options](#) ”.
- NWC File Parameters. See “ [NWC Options](#) ”.

Interface Options

You can configure:

- Display Units. See “ [Units Options](#) ”.
- Selection and Highlighting Parameters. See “ [Selection Options](#) ”, and “[Highlighting Objects](#)”.
- Measurement Parameters. See “ [Measure Options](#) ”.
- Snapping. See “[Snapping](#)”.
- Viewpoints. See “ [Viewpoints Options](#) ”.
- Hyperlinks. See “ [Hyperlinks Options](#) ”.
- Smart Tags. See “ [Smart Tags Options](#) ”.
- Profiles. See “ [Profiles](#) ”.
- Display Parameters. See “ [Display Options](#) ”.
- SpaceBall Parameters. See “ [Using a SpaceBall](#) ”

File Readers Options

You can configure:

- 3DS. See “ [3DS File Reader Options](#) ”.
- ASCII Laser Scan. See “ [ASCII Laser Scan File Reader Options](#) ”.
- DGN. See “ [DGN File Reader Options](#) ”.
- DWF. See “ [DWF File Reader Options](#) ”.
- DWG/DXF/SAT. See “ [DWG and DXF File Reader Options](#) ”.
- Faro Scan. See “ [Faro Scan File Reader Options](#) ”.
- IFC. See “ [IFC File Reader Options](#) ”.
- IGES. See “ [IGES File Reader Options](#) ”.
- Inventor. See “ [Inventor File Reader Options](#) ”.

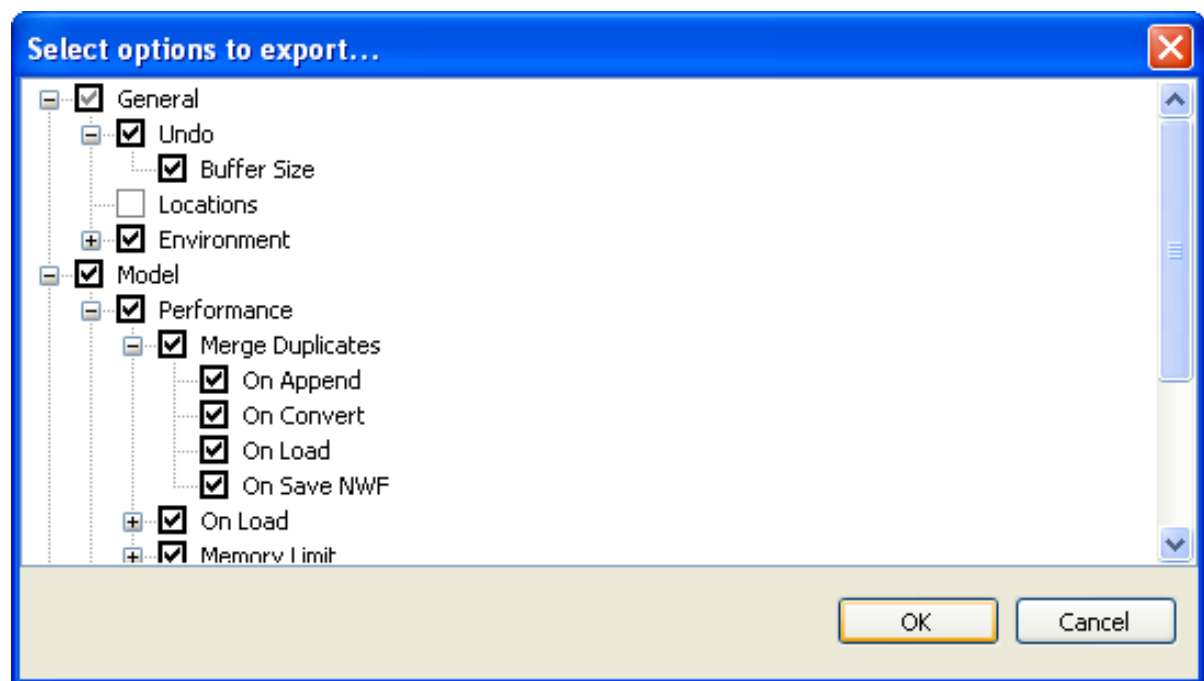
- Leica Scan. See [“ Leica Scan File Reader Options ”](#).
- MAN. See [“ MAN File Reader Options ”](#).
- PDS. See [“ PDS Files ”](#).
- Riegl Scan. See [“ Riegl Scan File Reader Options ”](#).
- RVM. See [“ RVM File Reader Options ”](#).
- SKP. See [“ Sketchup SKP File Reader Options ”](#).
- STEP. See [“ STEP File Reader Options ”](#).
- STL. See [“ STL File Reader Options ”](#).
- VRML. See [“ VRML File Reader Options ”](#).
- Z+F. See [“ Z+F Scan File Reader Options ”](#).

Importing and Exporting Global Options

To export Global Options:

1. On the **Tools** menu, click **Global Options**.
2. In the **Options Editor** dialog box, click the **Export** button.

The **Select Options to Export** dialog box is displayed:

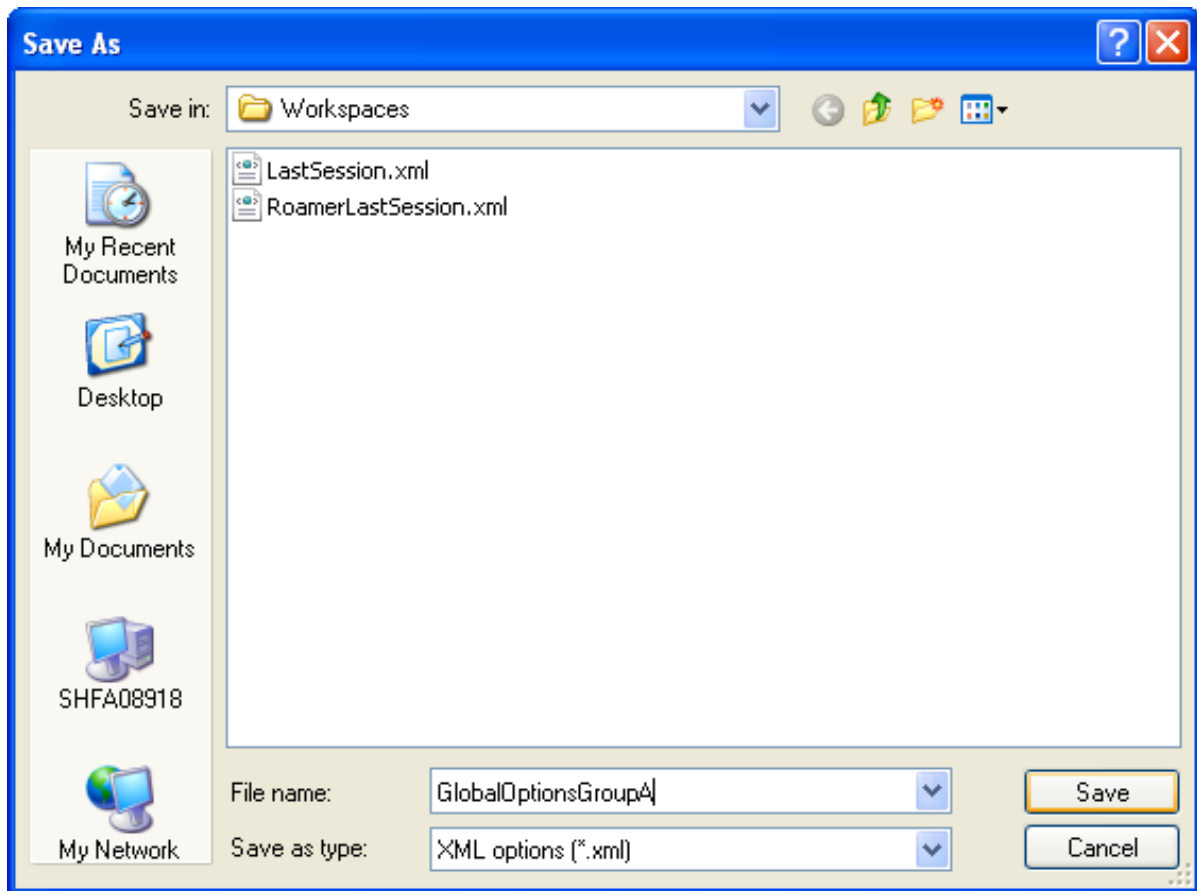


3. Select the check boxes for all options you want to be exported (or 'serialized'). If an option cannot be exported, it is greyed out.

Note:

To quickly select/deselect all options for a given category, use the top-level check boxes. For example, selecting the **General** check box, instantly selects all options under this node.

4. Click **OK** to export the settings.
5. In the **Save As** dialog box, enter a name for the settings file. You can also select the name of an existing settings file to overwrite it with your modified configuration.

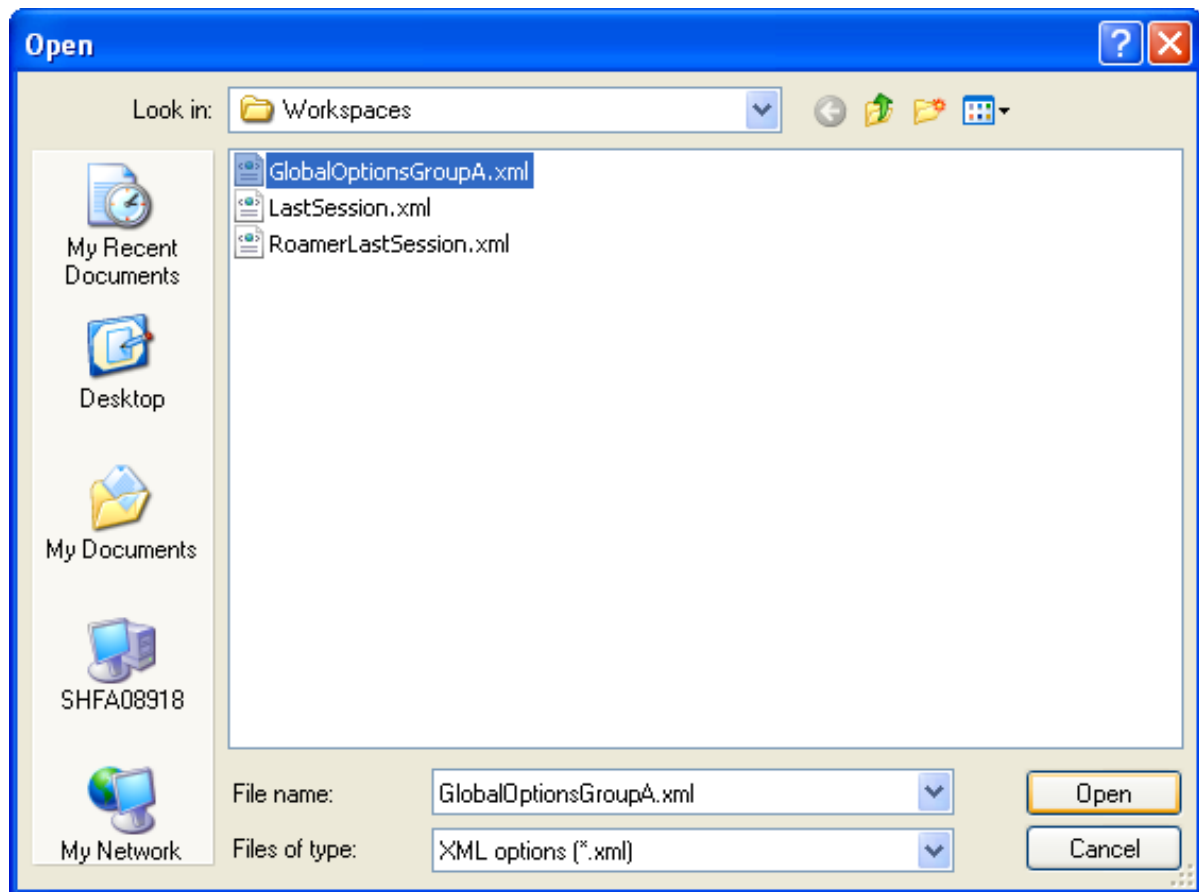


6. Click **Save**.
7. Click **OK** to close the **Options Editor**.

To import Global Options:

1. On the **Tools** menu, click **Global Options**.

2. In the **Options Editor** dialog box, click the **Import** button.
3. In the **Open** dialog box, browse to the folder containing the settings file, select it, and click **Open**.



4. Click **OK** to close the **Options Editor**.

Chapter 25. DataTools

This feature is used to link Object Property elements in NavisWorks to fields that exist in a table within a database. Any database with a suitable ODBC driver is supported, and properties contained within database tables can be brought through and shown on the **Properties** control bar. If an object in a scene has associated database properties, clicking on that object will show the properties in a separate tab.

Data linked from a database can also be included in any searches using the **Find** tool, and can also be used within **Clash Detective** as part of the clash criteria. See “[Finding Items](#)” for more details on how to use the **Find** tool, and the **Using Clash Detective** section for more information on clashes and clash criteria.

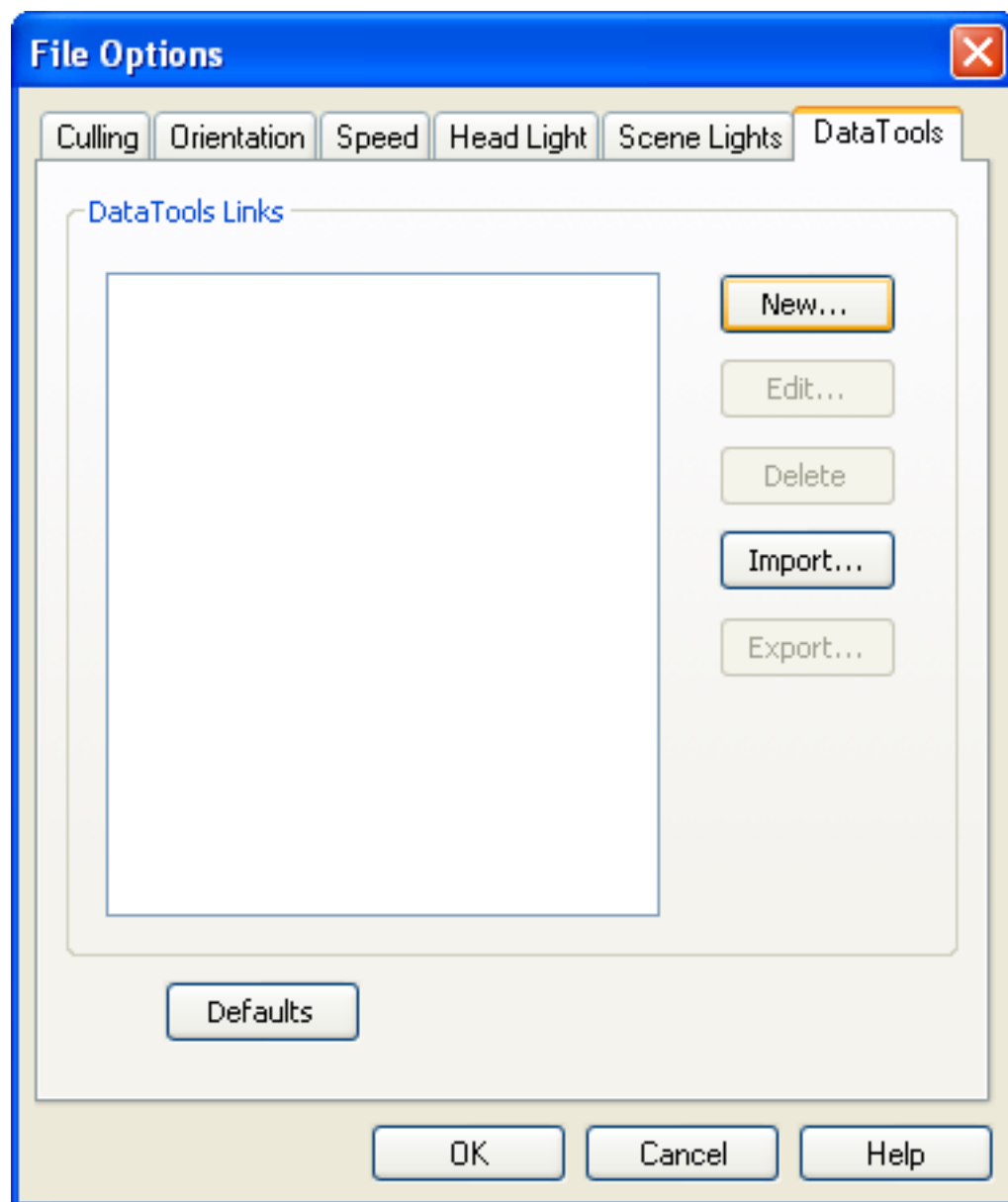
Adding Database Links

Databases are commonly used to store large amount of data, such as equipment specifications, catalogue data, and maintenance manuals.

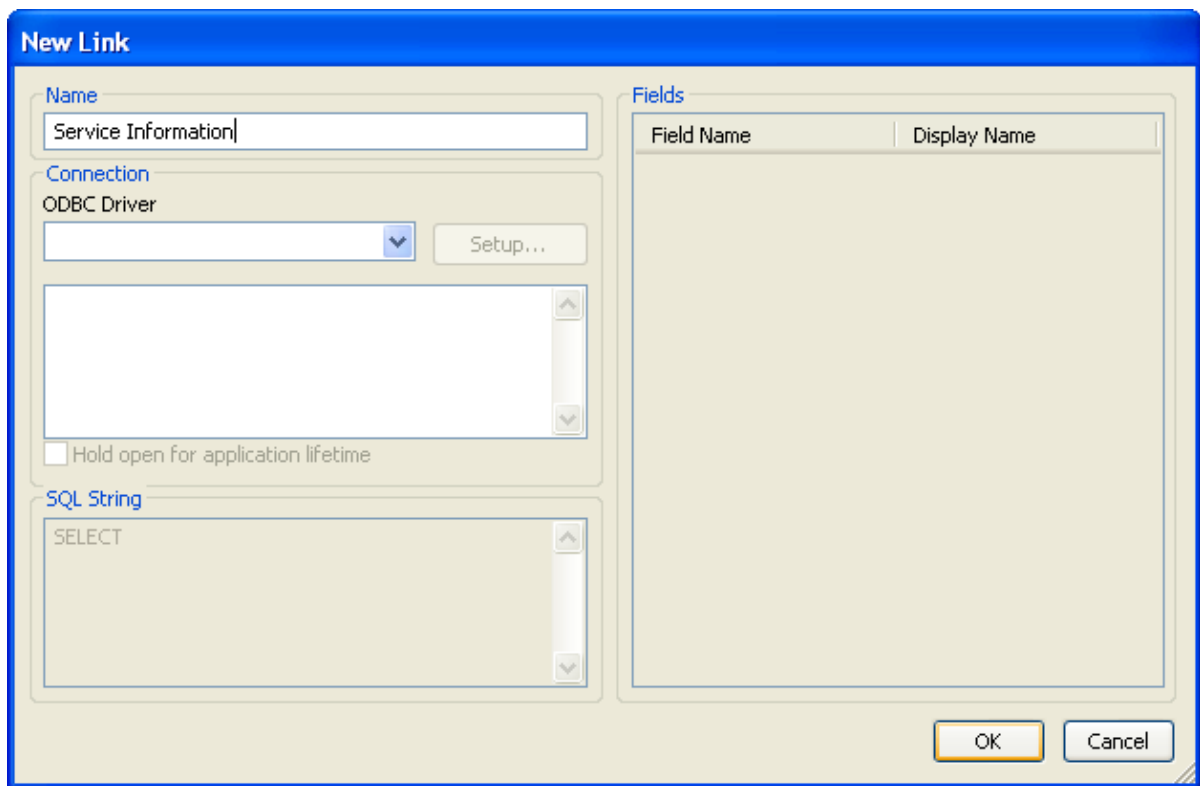
The **DataTools** functionality enables you to create and configure links between the stored data files, and the model files. You can have as many links as you wish, but they all should have unique names.

Adding a database link:

1. On the **Tools** menu, click **File Options**.
2. In the **File Options** dialog box, **DataTools** tab, click the **New** button.



3. In the **New Link** dialog box, enter a **Name** for the new link, e.g., 'Service Information'. This is the name of the tab that will appear on the **Properties** control bar.



The 'New Link' dialog box is shown with a blue title bar. It contains several sections: 'Name' with a text field containing 'Service Information'; 'Connection' with an 'ODBC Driver' dropdown menu, a 'Setup...' button, and a large empty text area; a checkbox labeled 'Hold open for application lifetime'; 'SQL String' with a text area containing 'SELECT'; and 'Fields' with a table header showing 'Field Name' and 'Display Name'. At the bottom right are 'OK' and 'Cancel' buttons.

Field Name	Display Name
------------	--------------

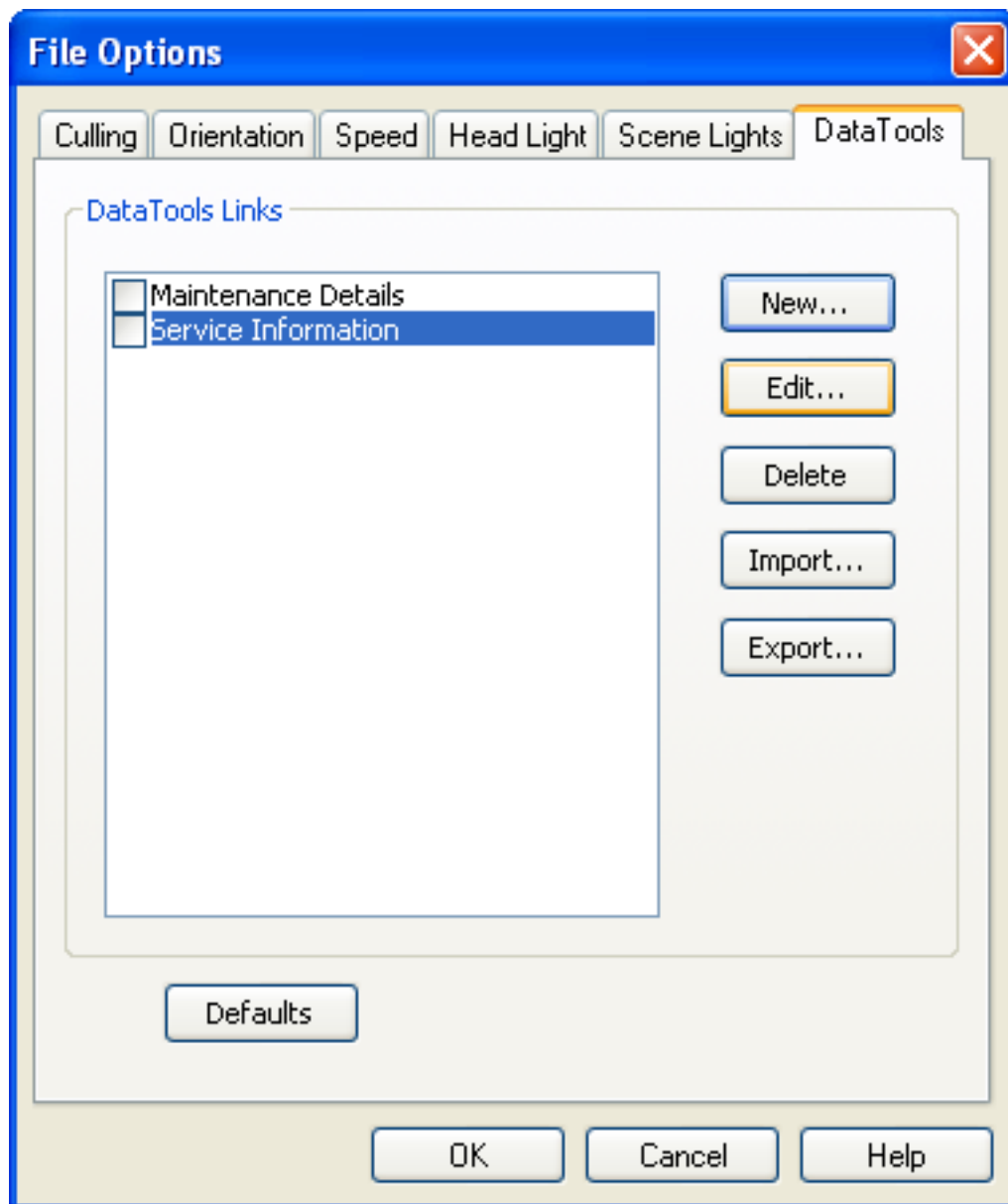
You are now ready to configure the database link.

4. Click **OK** to save the link and return to the **File Options** dialog box.

Configuring Database Links

To configure a database link:

1. On the **Tools** menu, click **File Options**.
2. In the **File Options** dialog box, **DataTools** tab, select the link you want to configure in the **DataTool Links** area, and click the **Edit** button.



Note:

If you haven't added any links yet, click the **New** button, and follow the procedure for adding database links first.

3. Configure the ODBC Driver:

In the **Edit Link** dialog box, select the appropriate **ODBC Driver** to define the type of the database to link to, for example 'Microsoft Access Driver (*.mdb).

Click the **Setup** button. The driver wizard will open, and guide you through the setup options. If you have difficulties setting up your connection details, contact your database administrator. When you finish, the box underneath will show the connection string. This string can be modified, if necessary. For the list of tags you can use in the string, see “

Full Tag List ”.

For example, if you want to select a database with a certain name (say, test.mdb) that is always next to the model file (as in the resultant NWD/NWF not the original), type in:

```
DBQ=%pushpath(%poppath(%currentpath), "test.mdb");  
DRIVER={Microsoft Access Driver (*.mdb)};
```

If you want to select a database with the same name as the original model file (say, AutoPlant), type in:

```
DBQ=%join(%removeext(%removepath(%sourcepath)), ".mdb");  
DRIVER={Microsoft Access Driver (*.mdb)};
```

4. Select the **Hold Open for Application Lifetime** check box, if you want to keep the database link open until you exit NavisWorks.
5. Specify which table in the database to query:

In the **SQL String** field, click after SELECT, and enter the selection statement, for example: `SELECT * FROM tblBoilerData WHERE "NWUniqueID" = %prop("Entity Handle", "Value");`

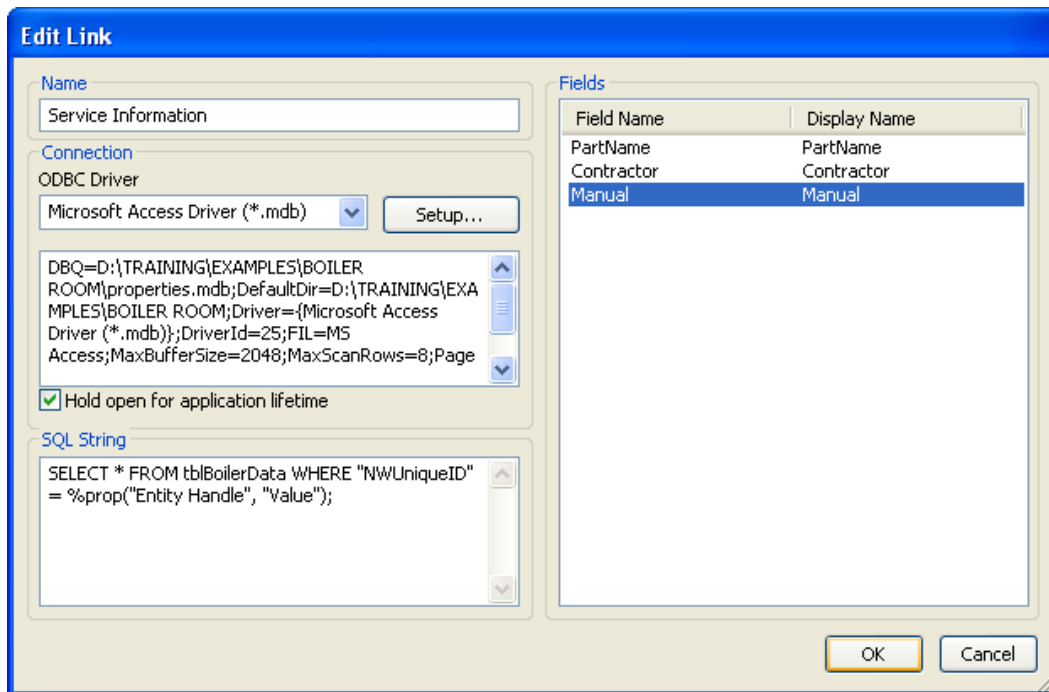
This statement instructs NavisWorks to select all columns from the tblBoilerData table, whilst requiring that the column called NWUniqueID matches a category/property pair called Entity Handle/Value. For the list of tags you can use in the SQL statement, see “[Full Tag List](#)”.

6. Select which columns you want to display as link categories on the **Properties** control box:

Double-click the **Fields Name** field, type the exact name of the database column, for example: "PartName", and press **Enter**.

The **Display Name** is automatically completed for you, but you can click it, and enter a different name, if you want. The text entered here is the category name shown on the link tab of the **Properties** control bar.

Repeat the above process to list all required categories in the **Fields** area of the dialog box.



7. Click **OK** to save the changes.

Note:

The model is not linked to the external data source until you have activated the link.

Managing Database Links

All file-based connection information is saved inside the project NWF or NWD. The global connection information is saved on the local machine. If the associated database is available on loading the NWF/NWD file, the link will automatically establish itself when an object is selected. On selecting an object, if the database is available, and there is data associated with the object, NavisWorks will create an appropriate database tab in the Properties control and show the appropriate data as set up in the connection details.

Object Properties can be extracted from a database connection and embedded as static data within the published NWD file. See [“Publishing from NavisWorks”](#) for more information.

Activating Database Links

To use a database link, you need to activate it. To do this, click **Tools > File Options**, open the **DataTools** tab, select the check boxes for all links you want to activate, and click **OK**.

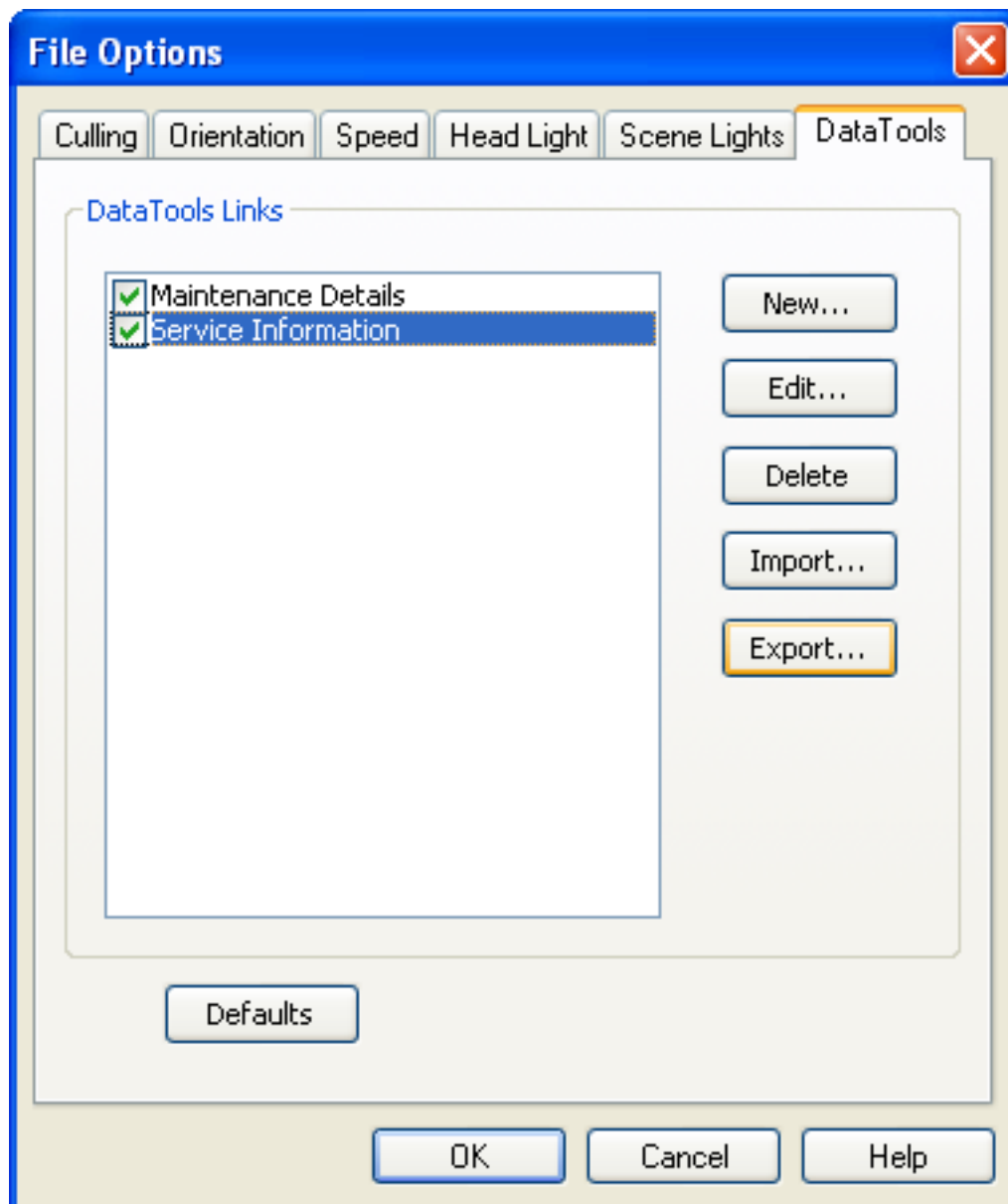
Note:

You cannot activate links with insufficient or invalid configuration information.

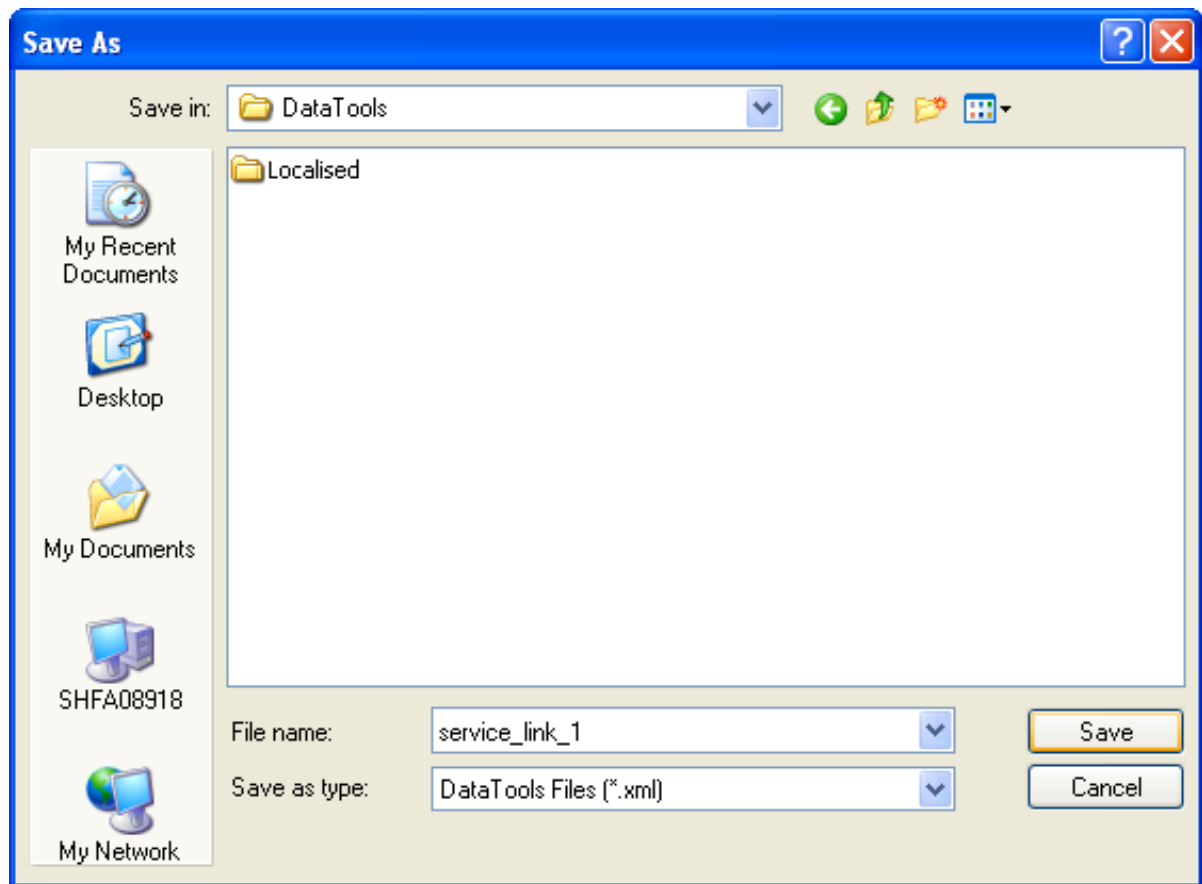
Exporting Database Links

To export a database link:

1. On the **Tools** menu, click **File Options**.
2. In the **File Options** dialog box, **DataTools** tab, select the link you want to export, and click the **Export** button.



3. In the **Save As** dialog box, browse to the desired folder, and enter a name for the datatools file. You can also select the name of an existing datatools file to overwrite it with your modified configuration.

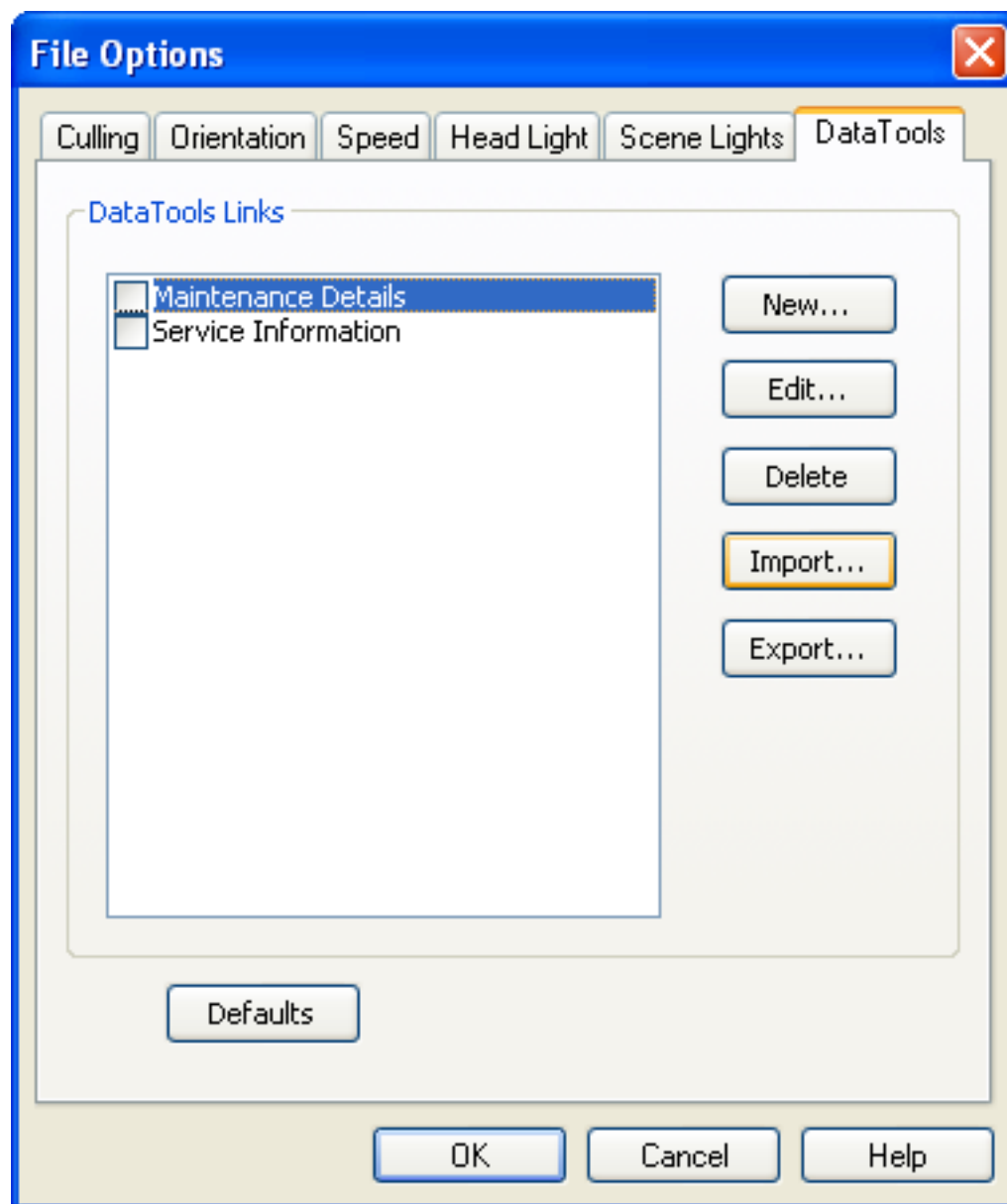


4. Click **Save**.
5. Click **OK** to close the **File Options** dialog box.

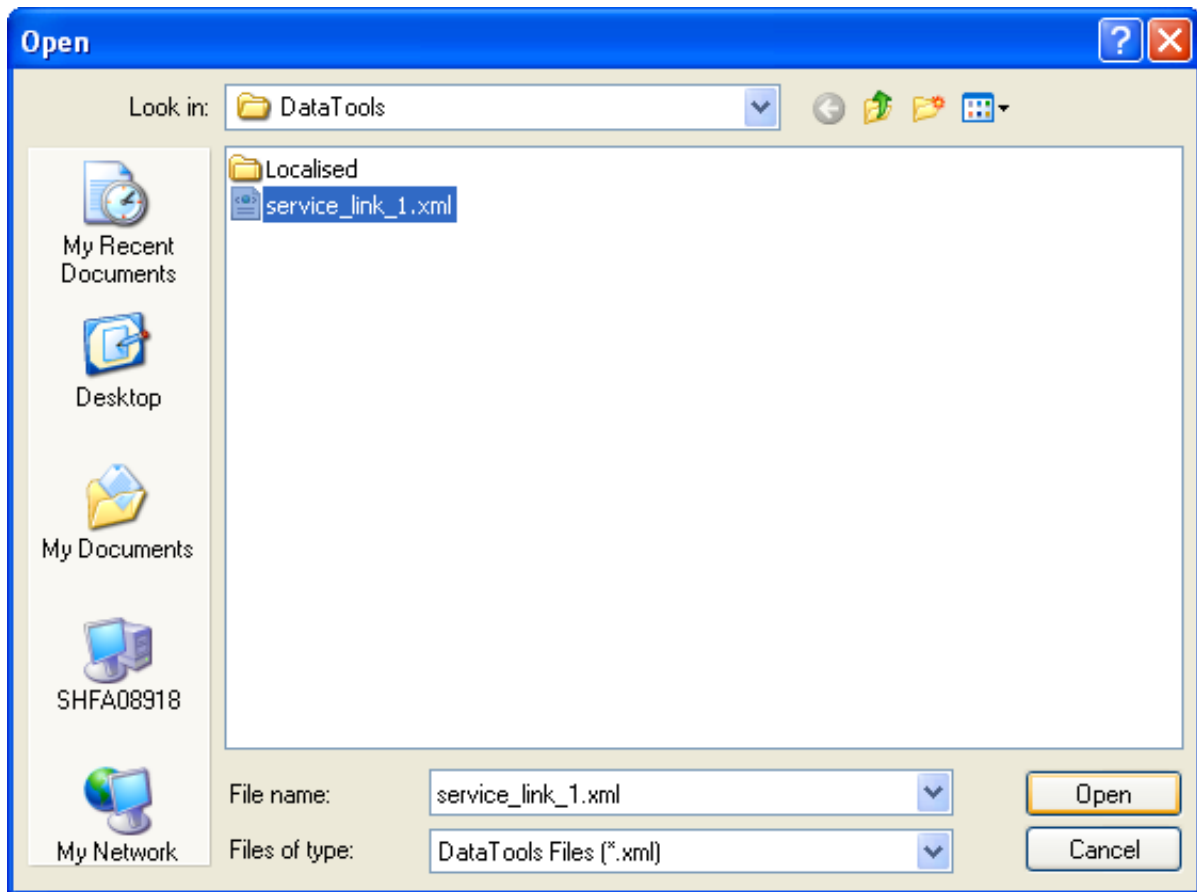
Importing Database Links

To import a database link:

1. On the **Tools** menu, click **File Options**.
2. In the **File Options** dialog box, **DataTools** tab, and click the **Import** button.



3. In the **Open** dialog box, browse to the folder containing the datatools file, select it, and click **Open**.



4. Click **OK** to close the **File Options** dialog box.

Full Tag List

This section lists all NavisWorks tags you can use.

Property Tags

- **%prop("category","property")** - Property of the currently selected object. Category is the name of the tab in the property windows (e.g. Item or Entity Handle) and property is the name of the property in that tab (e.g. Value or Layer).
- **%intprop("category","property")** - Property of the currently selected object. This is the same as the previous tag except instead of using the publicly visible category and property name use the internal NavisWorks names. The benefit of using internal names is that they are not language dependent. This is advanced tag suitable for users familiar with the NavisWorks API.

File/Path Tags

- **%sourcepath** – This tag represents the full path and filename that the currently selected object comes from. Even when a collection of model files have been combined into a single NWD file this tag will still remember the path and filename of the original model file.
- **%currentpath** - This tag represents the full path and filename of the currently loaded model. If you currently have an NWF or NWD loaded that contains many other models it will just return the path and filename of the top level NWF/NWD.

File/Path Manipulation Tags

- **%removeext("text")** – If the provided text includes a filename with an extension this tag will remove the extension.
- **%removepath("text")** – If the provided text includes a path and filename this tag will remove the path and just return the filename.
- **%poppath("text")** – If the provided text includes a path this tag will remove the top level. If it the text also includes a filename that will count as the top level and be removed. For example, `%poppath("c:\temp")` becomes `c:\` and `%poppath("c:\temp\readme.txt")` becomes `c:\temp`.
- **%pushpath("text1","text2")** – If text1 is a path and text2 is a file or folder name then text2 will be added onto the path in text1. For example, `%pushpath("c:\test","model.nwd")` becomes `c:\test\model.nwd`.

String Manipulation Tags

- **%join("text","text")** – This tag simply joins the two pieces of text together. For example, `%join("c:\","model.nwd")` would return `c:\model.nwd`.

Note:

Tags must not contain white space between the brackets (unless enclosed by quote marks), so

```
%prop("EntityHandle","Value")
```

works, but

```
%prop("EntityHandle", "Value")
```

does not.

Examples

The examples below illustrate how tags could be used with SQL queries.

- Selecting all columns from table Test whilst requiring that the column called Entity Handles matches a category/property pair called Entity Handle/Value and the column called File Name matches the original filename of the drawing:

```
SELECT * FROM Test WHERE "Entity Handle" = %prop("Entity Handle","Value")
AND "File Name" = $removeext(%removepath(%sourcepath));
```

Here the path and the extension of the file name are being stripped, so a file like
c:\model\3rdFloorDucts.dwg would come out as 3rdFloorDucts.

- Selecting two columns from table Test whilst requiring that the column called Entity Handle matches a category/property pair called Entity Handle/Value:

```
SELECT Name,Part FROM Test WHERE "Entity Handle" = %prop("Entity
Handle","Value");
```

- Selecting all columns from table Test whilst requiring that the column called Value is within a certain range given by two category/property pairs:

```
SELECT * FROM Test WHERE Value BETWEEN %prop("Pressure","Minimum") AND
%prop("Pressure","Maximum");
```

Chapter 26. Getting Help

The **Help** menu gives you access to useful resources about your system, your product and the documentation. NavisWorks comes with full context-sensitive help as well as user guides in Adobe Acrobat™ .pdf format. The **Help** menu contains:

- Help Topics
- What's This?
- NavisWorks on the Web
- License
- Customer Involvement Program
- System Info
- About NavisWorks

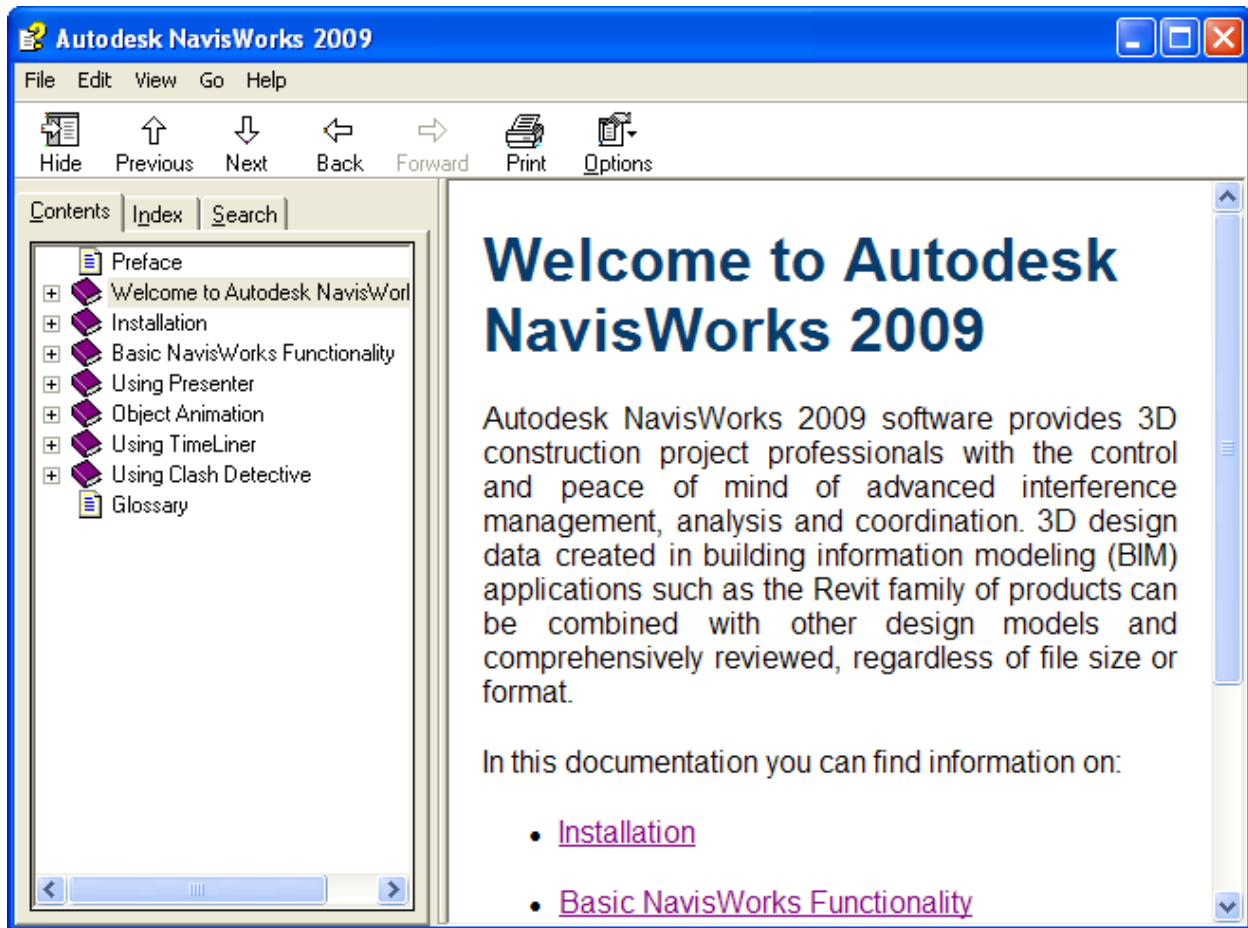
If the online documentation and help does not answer your query, try www.autodesk.com/support. If the website does not help answer your problem, you should contact the reseller from whom you purchased the software.

Help Topics

NavisWorks contains full help documentation. This is structured in chapters, sections and procedures which can be easily navigated on the **Contents** tab.

To open the NavisWorks help documentation, click **Help > Help Topics** on the menu bar.

The **NavisWorks** help window is displayed:




In the **Contents** tab, select an item to view its contents. Expand and contract the chapters and sections (identified with a book icon) using the plus and minus icons to the left of them. The contents of the selected item will be displayed in the right hand pane.

The **Index** tab has a full index of all NavisWorks help topics. Select the topic you are interested in learning more about from the list, then click **Display**. The selected topic will be displayed in the right hand pane.

Should you not be sure of the topic name that you are interested in learning more about, use the **Search** tab to search on any keyword. Enter the keyword to be found, then click **List Topics**. Any topics within the NavisWorks help containing the keyword you entered, will be listed. Select the topic you are interested in and then click **Display**. The selected topic will be displayed in the right hand pane.

You can enclose a phrase in quotation marks to search on that exact phrase.

What's This?

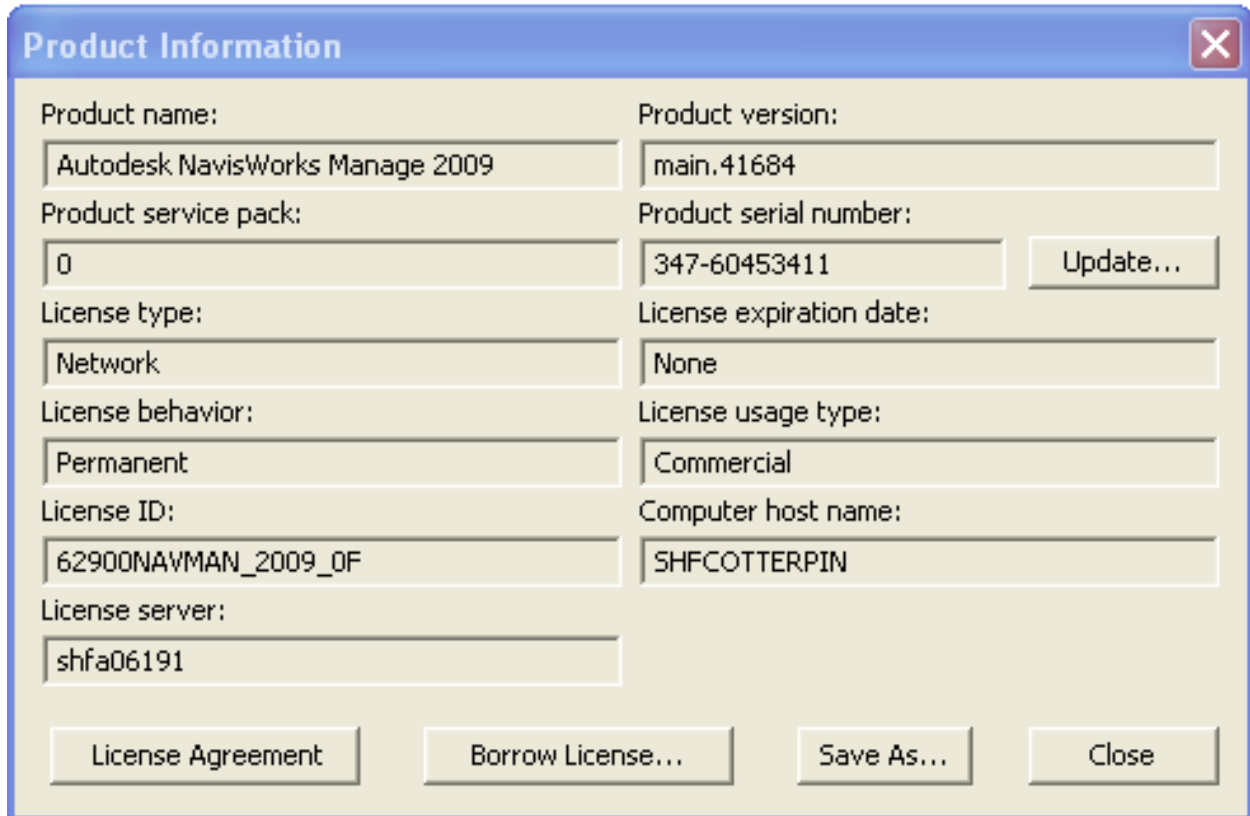
NavisWorks contains full context-sensitive help. If you want to find out more about any item in the interface. Click  and click over the toolbar button, window or menu command that you want to know more about. The appropriate **Help** topic will then be displayed.

NavisWorks on the Web

To visit the NavisWorks pages on the Internet, click **Help > NavisWorks on the Web** on the menu bar.

License

Opens the **Product Information** dialog box, which enables you to view and manage your license information:

The image shows a 'Product Information' dialog box with a blue title bar and a close button (X) in the top right corner. The dialog contains several text input fields and buttons. The fields are arranged in two columns. The first column contains: 'Product name:' with 'Autodesk NavisWorks Manage 2009', 'Product service pack:' with '0', 'License type:' with 'Network', 'License behavior:' with 'Permanent', 'License ID:' with '62900NAVMAN_2009_OF', and 'License server:' with 'shfa06191'. The second column contains: 'Product version:' with 'main.41684', 'Product serial number:' with '347-60453411' and an 'Update...' button, 'License expiration date:' with 'None', 'License usage type:' with 'Commercial', and 'Computer host name:' with 'SHFCOTTERPIN'. At the bottom of the dialog are four buttons: 'License Agreement', 'Borrow License...', 'Save As...', and 'Close'.

License Agreement - opens the Autodesk Software License Agreement.

Update - enables you to update the serial number.

Save As - enables you to save the license information as a .txt file.

Activate - enables you to activate the product.

For network license installations, it also allows you to borrow/return license (see the procedures below).

To borrow a license:

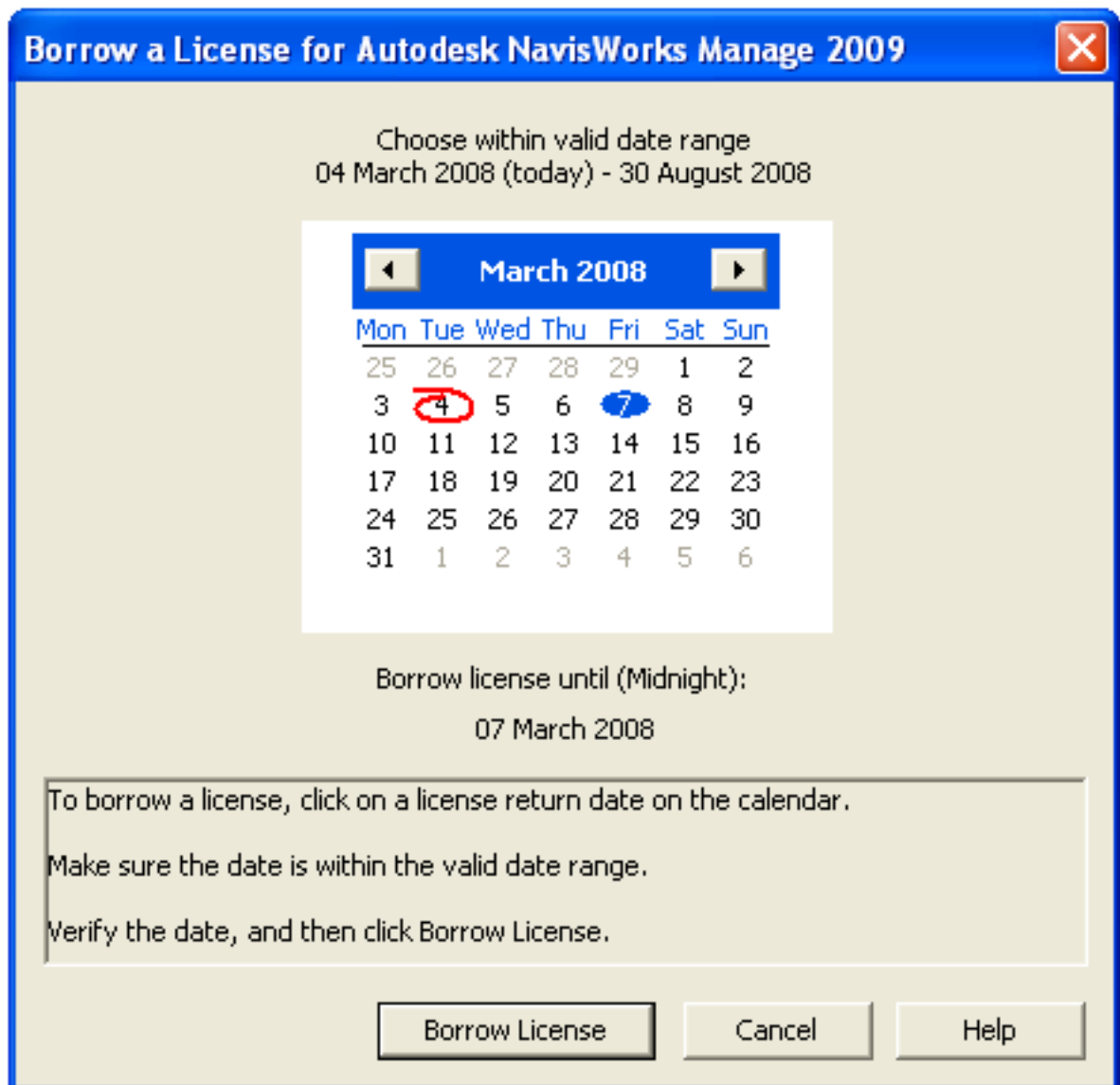
1. Start NavisWorks, and click **Help > License**.
2. In the **Product Information** dialog box, click the **Borrow License** button.

Note:

This allows you to use license while not connected to the network (e.g. site visit) but means that the license is not available to anyone else. If not explicitly returned the license will be automatically returned on the date you specify.

3. In the **Borrow a License for Autodesk NavisWorks Review 2009** dialog box, use the Calendar to select the date you want to borrow the license until, and click the **Borrow License** button.

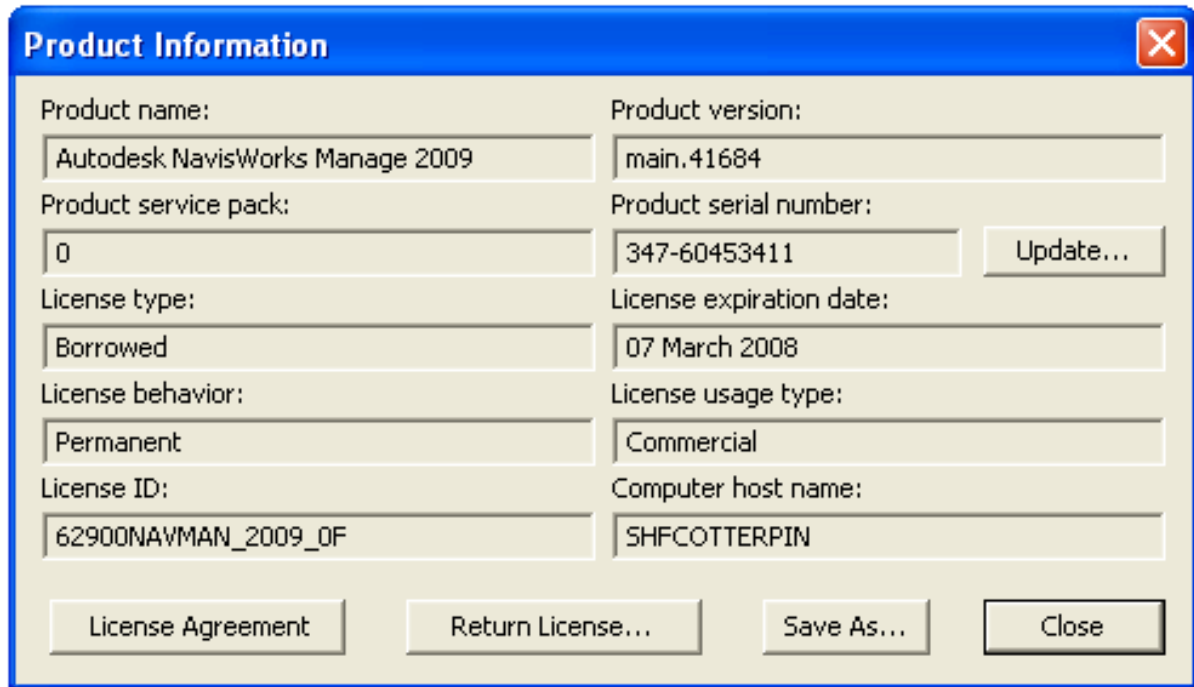
This date should be the longest time you will be unable to reach the network for.



4. Click **OK**. Your license is now borrowed. Once borrowed, you can return the license whenever you want or simply wait for it to expire.

To return a borrowed license:

1. Start NavisWorks, and click **Help > License**.
2. In the **Product Information** dialog box, click the **Return License** button.

The image shows a 'Product Information' dialog box with a blue title bar and a close button (X) in the top right corner. The dialog contains several text fields and buttons. The fields are arranged in two columns. The first column contains: 'Product name:' with the value 'Autodesk NavisWorks Manage 2009', 'Product service pack:' with the value '0', 'License type:' with the value 'Borrowed', 'License behavior:' with the value 'Permanent', and 'License ID:' with the value '62900NAVMAN_2009_OF'. The second column contains: 'Product version:' with the value 'main.41684', 'Product serial number:' with the value '347-60453411' and an 'Update...' button to its right, 'License expiration date:' with the value '07 March 2008', 'License usage type:' with the value 'Commercial', and 'Computer host name:' with the value 'SHFCOTTERPIN'. At the bottom of the dialog, there are four buttons: 'License Agreement', 'Return License...', 'Save As...', and 'Close'.

3. Click the **Return License** button, and then **Yes** when asked if you want to return it.

You have now returned to the original state.

Note:

Refer to the Autodesk Network Licensing Guide and Autodesk Standalone Licensing Guide for more information (accessible from the installer).

Customer Involvement Program

The Customer Involvement Program (CIP) is a program that dramatically improves the way Autodesk designs software and measures performance and quality. It lets customers be involved in helping make Autodesk products better meet their needs and the needs of the larger community of users.

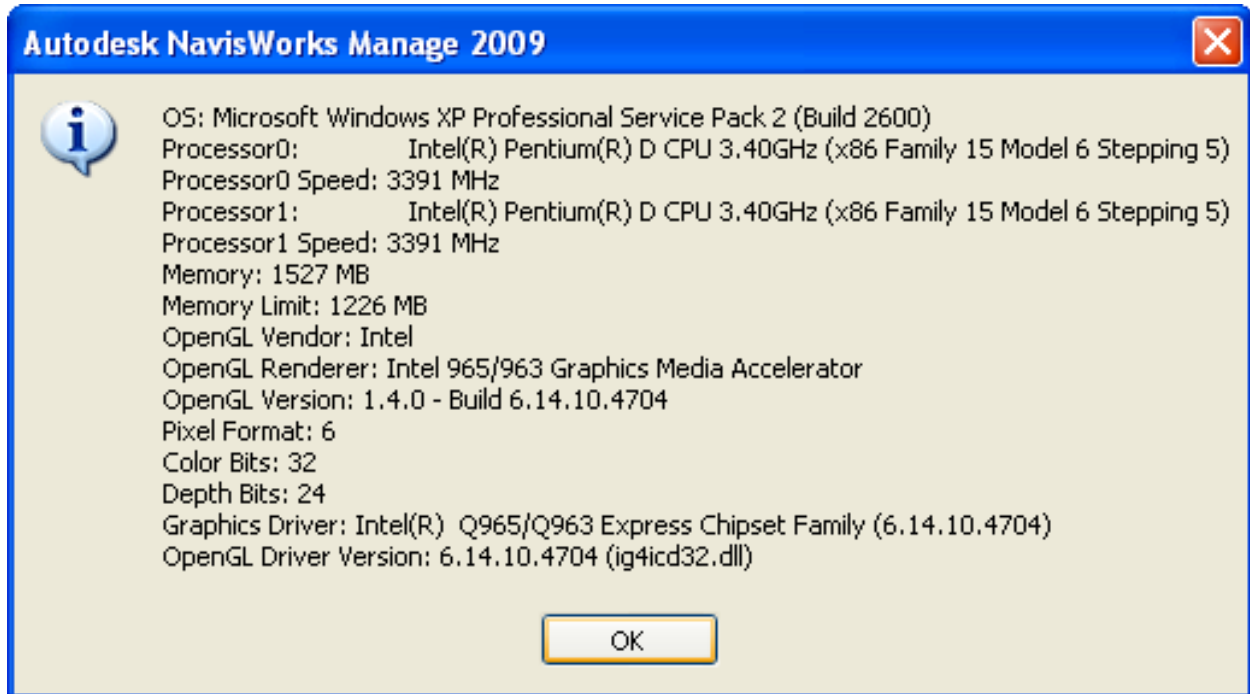
CIP automatically collects information about software features usage, system configuration and software errors from those customers that choose to participate. About once a day, a small file containing CIP information is sent to Autodesk's servers. The CIP program DOES NOT send actual design information to Autodesk so it is not possible for Autodesk to replicate your actual drawings or design information using the CIP information.

If you'd like to join the Customer Involvement Program, click **Help > Customer Involvement Program** on the menu, select the participation option in the dialog box, and click **OK**.

You can stop your participation in the CIP program at any time by accessing the CIP dialog box again.

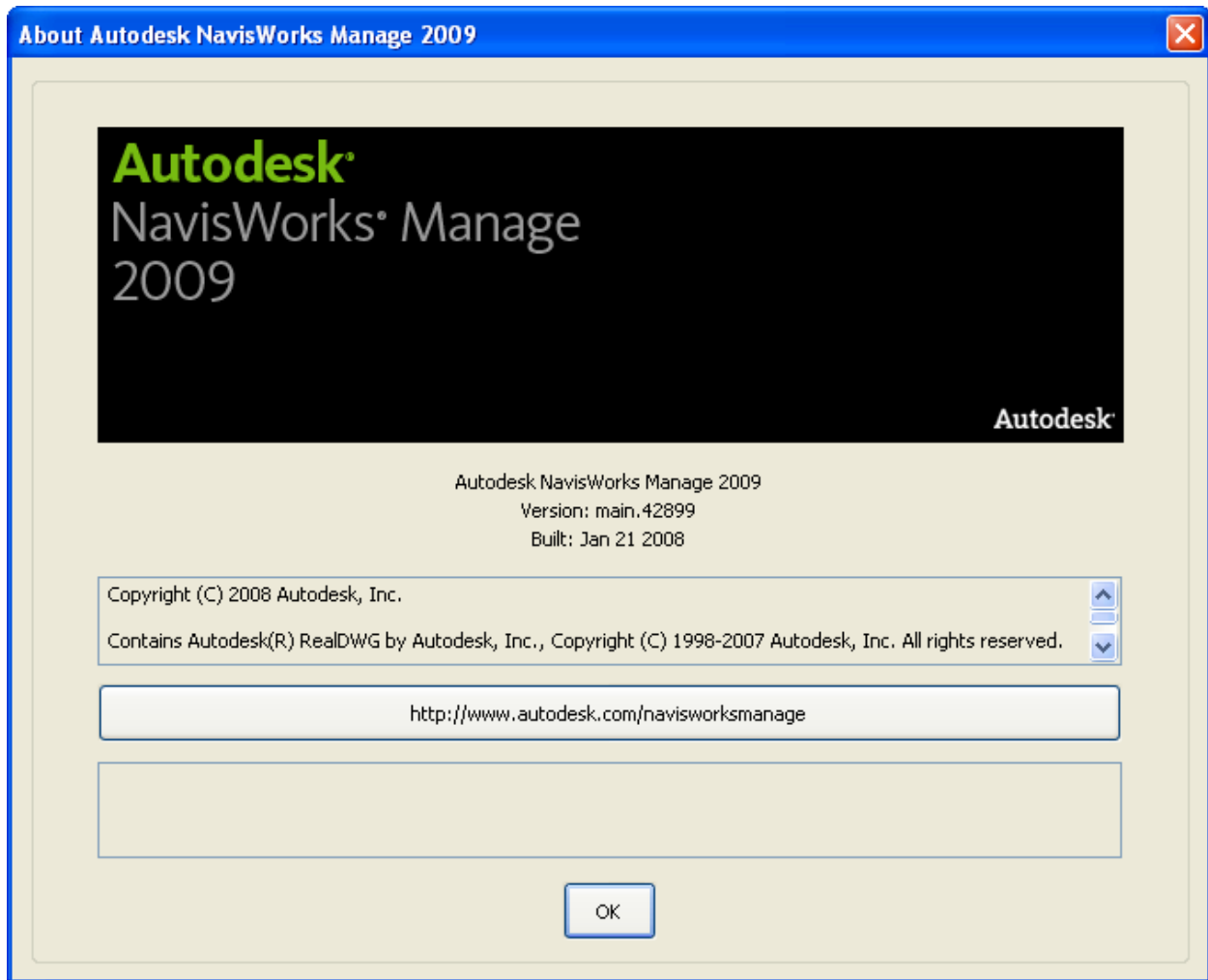
System Info

Opens a dialog giving you detailed information about your system, which can be helpful in support situations.



About NavisWorks

Opens a dialog giving you information about your product, including version and build number, which can be helpful in support situations.



Part 4. Using TimeLiner Playback

TimeLiner playback enables you to play back a TimeLiner construction sequence. In this section, you will learn how to simulate your TimeLiner sequence throughout the duration of the project schedule.

Chapter 27. Overview of TimeLiner

The TimeLiner tool adds 4D schedule simulation to Autodesk NavisWorks Review 2009.

In NavisWorks, TimeLiner has a playback-only option, allowing any externally created project data to be simulated, but no changes to be made to that data.

Working with the TimeLiner Window

By default, the TimeLiner window floats in the main NavisWorks window. Like all other floating windows, TimeLiner window is dockable and resizable, and will automatically lock to specific locations near to where it is moved. You can prevent it from docking while you drag it, by holding down Ctrl.

Note:

You can quickly dock and undock any floating window by double-clicking the window's control bar.

To open the TimeLiner window, select **TimeLiner** from the **Tools** menu.

The TimeLiner window contains the following:

- Simulate tab - enables you to set up and play simulations.

The Task Status

The Status Icons

Each task has its own **Status** identified by an icon, representing planned against actual relationships. Each icon shows two bars. The top bar represents the **Planned** dates, and the bottom bar represents the **Actual** dates. If the Actual start and finish dates are the same as the Planned start and finish dates, the bars are displayed in green. Any variations between Planned and Actual dates are displayed in red. Missing Planned or Actual dates are shown in grey.



Actual start and end dates equal Planned start and end dates.



Actual end date before Planned start date.



Actual start date after Planned end date.



Actual start date before Planned start date and Actual end date after Planned end date.





Actual start date before Planned start date and Actual end date equals Planned end date.





Actual start date equals Planned start date and Actual end date after Planned end date.


end date.


 Actual start date equals Planned start date and Actual end date before Planned end date.

 Actual start date after Planned start date and Actual end date equals Planned end date.

 Actual start date before Planned start date and Actual end date before Planned end date.

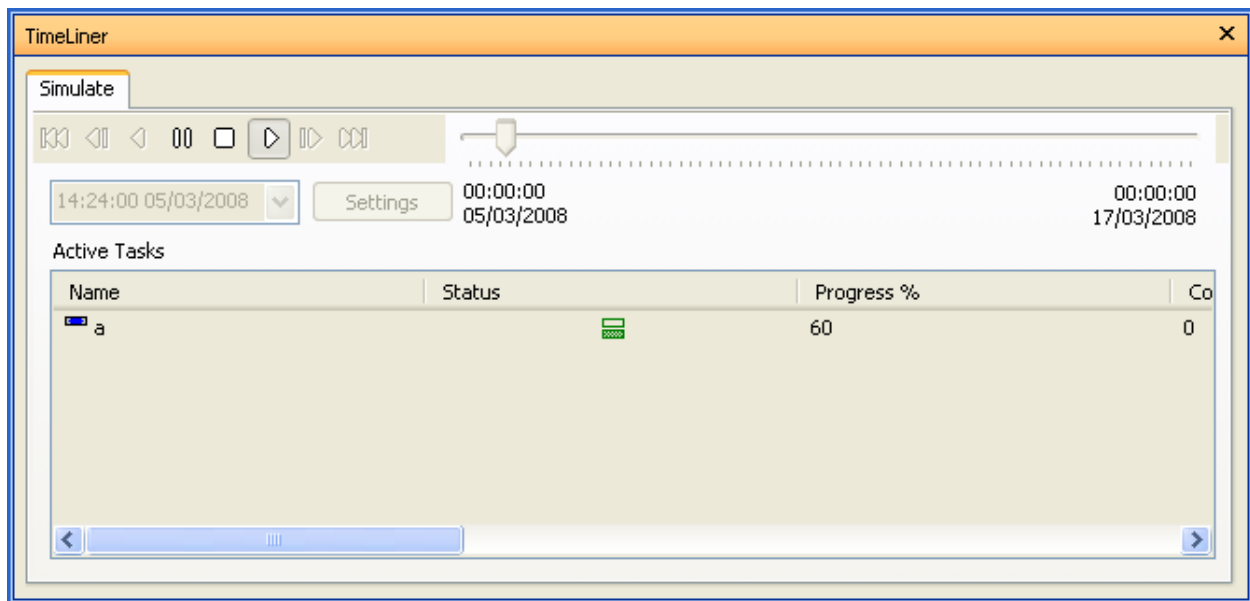
 Actual start date after Planned start date and Actual end date after Planned end date.

 Actual start and end dates only.

 Planned start and end dates only.


The Simulate Tab


The **Simulate** tab enables you to simulate your TimeLiner sequence throughout the duration of the project schedule.





The Playback Controls


Use the standard VCR buttons to step and play forwards and backwards through the simulation:


Rewind  will rewind the simulation back to the beginning.


 will step back a single step size.


Reverse Play  will play the simulation backwards.

Pause  will pause the simulation at the time you press it at. You can then look around and interrogate the model, or step forwards and backwards through the simulation. To continue playing from where you paused, just press **Play** again.

Stop  will stop the simulation playing and rewind back to the beginning.

Play  will play the simulation from the currently selected time.

Step Forwards  will step forwards a single step size.

Forward  will fast forward the simulation to the end.

You can use the **Simulation Position** slider to quickly move forwards and backwards through the simulation. Full left is at the beginning and full right is at the end.




The **Date/Time** box below the VCR buttons shows the point in time through the simulation. You can click on the drop-down icon to the right of the date to display a calendar, from which you can select a date to 'jump' to.

The Active Tasks

You can view the current simulation time for each of the active tasks, and how close to completion they are (**Progress** is displayed as a percentage). The **Status** of each active task is also displayed as an icon. For simulations where Planned and Actual dates are available, the status provides a visual representation as to whether there is any variance between the planned and actual dates. See TimeLiner task status for more information.

Playing Simulations

To play a simulation:

1. If the TimeLiner window is not already open, select **Tools > TimeLiner** from the menu bar.
2. Click the **Play**  button.

The TimeLiner window displays the tasks as they are carried out, and the main NavisWorks window shows the sections of the model added or removed over time, in accordance with the task types.

Glossary

Glossary of technical terms relating to Autodesk NavisWorks Review 2009.

Display Terminology

Average Frame Rate

This shows the current measured frame rate, averaged over the last second.

Average Frame Time

This shows the time taken to render the last frame.

Average Triangle Rate

This shows the rate at which triangles are being rendered and is a measure of how well your graphics card is working.

Culling

Culling is a process for determining items *not* to draw during the render of a scene. NavisWorks does a level of prioritized culling with the drop-out method of rendering interactive scenes, but you have a certain level of control over other aspects of culling such as backface, near and far planes.

Drop-Out

In order to maintain interactivity and guarantee a user-defined frame rate, NavisWorks only renders what it can in the fraction of a second it has. The remainder is "dropped out", or not rendered. However, NavisWorks prioritizes what is rendered and what is dropped out based on size of the item's bounding box, distance from viewer and size on screen, so only the less significant items in the scene are dropped out. Once navigation has ceased, the scene continues rendering until all items are visible.

Frame Rate

The frame rate is the number of frames per second (FPS) that are rendered in the main navigation window. NavisWorks guarantees a user-defined frame rate in order to maintain interactivity.

Export Terminology

These are terms specific to NavisWorks that are used in relation to exporting.

Codec

Codec stands for "COmpression-DECompression" and is a program that compresses and decompresses animations when creating and playing back .avi files. Codecs are installed independently of NavisWorks and are available when installed on your Windows™ system and the same codec that was used to create an .avi file is required to play it back.

File Terminology

.nwc Cache Files

When any native CAD file is opened or appended, NavisWorks creates a cache file (.nwc) if the write cache option is set. When the file is next opened or appended, NavisWorks will read data from the corresponding cache file rather than re-converting the original data if the cache is newer than the original file. If the original file is altered, NavisWorks will re-create the cache file when it is next loaded. Cache files speed up access to commonly used files. They are particularly useful for models made up of many files of which only a few are changed between viewing sessions. Cache files can also be exported from some CAD applications where a native file reader is not available with NavisWorks. Cache options can be edited from the **Global Options** dialog box under the **Tools** menu.

.nwd Published Data Files

Published .nwd files are useful when wanting to take a snapshot of the model at a certain time. All the geometry and review information is saved into the .nwd file and cannot then be changed. Published .nwd files can also contain information about the file, as well as being able to be password protected and time-bombed for security. These files are also very small, compressing the CAD data by up to 80% of the original size.

Published .nwd files are useful when issuing models for viewing by others with the NavisWorks Freedom free viewer, as well as being appendable themselves into NavisWorks to build up a larger scene.

.nwf Review Files

Review files are useful when using the native CAD files appended into NavisWorks. They store the location of the appended files, along with any design reviews made in NavisWorks, such as comments, redlines, viewpoints, animations and so on.

If a group of files is appended into a NavisWorks scene, and saved as an .nwf file, then on re-opening this .nwf file later, once the original CAD files have been changed, the updated CAD files will be loaded into the scene for review.

External References

External references (sometimes called reference files or "XRefs") are shown in NavisWorks selection tree as an inserted group. NavisWorks looks for the externally referenced files in the same place as AutoCAD or MicroStation would.

If the **Unresolved XRef** dialog box is shown, then this link has somehow been broken and the referenced files need to be relocated to where AutoCAD or MicroStation would expect them to be.

If these XRefs are not important for the current session, then you can **Ignore** the reference and the file will load without that XRef inserted. Similarly, **Ignore All** will load the file without any unresolved XRefs.

You can also use the **DWG/DXF** and **DGN** options in the **Tools, Global Options** dialog to set whether external references are loaded or not, giving you more control over file appending into NavisWorks.

Faceting Factor

During an export from a CAD package to .nwc, or while NavisWorks is reading a native CAD file, decisions must be made as how a curved

surface is reduced to flat facets. For most applications and file formats, you have control over the level of faceting that takes place.

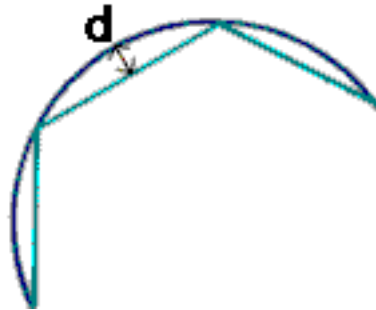
All items, no matter what their size, will use the same faceting factor and so have the same number of sides to curved entities. Therefore, you need to experiment a little with different values to account for the size that these items will appear on screen.

The faceting factor must be greater or equal to 0, where 0 results in the faceting factor being turned off. The default value is 1, if you double the value you get twice the number of facets, if you halve the value you get half as many facets. Larger faceting factors will result in more polygons to a model and larger NavisWorks files. There is little point having a large faceting factor if these curved entities are golf balls viewed from 200 yards!

For AutoCAD exports, the faceting factor is set from the NWCOPT command, MicroStation's faceting factor is set from **Options**, which is available from the NWCOUT export dialog, and the option to set the faceting factor on reading CAD files is found by choosing **Tools, Global Options**, and the relevant options tab.

Max Facet Deviation

Maximum facet deviation is used in conjunction with faceting factor to ensure that larger objects, with too large a deviation from the original, have additional facets added. If a difference greater than the entered value is found in a model it adds more facets. The values are measured in the model units.



Where d is greater than the maximum faceting deviation value, more facets are added to the object.

If the max faceting deviation is set to 0, then this function is ignored and just the faceting factor is used.

Shape Merge Threshold

MicroStation shapes are polygons that can have 3 or more vertices. They're often used to model more complex objects which can waste memory. So, NavisWorks merges all shapes on the same level or in the same cell and with the same color into a "Shape Set" if these shapes have less than or equal to the number of vertices given by the *Shape Merge Threshold*.

Selection Terminology

These are terms specific to NavisWorks that are used in relation to selecting items.

Composite Objects

A composite object is a group of geometry that is considered a single object in the selection tree. For example, a window object might be made up of a frame and a pane. If a composite object, the window object would be both the frame and the pane and be selected all at once.

Instances

An instance is a single object, which is referred to several times within a model, for example a tree. This has the advantage of cutting down on file size by not unnecessarily repeating an object.

Item Name

The original CAD or NavisWorks assigned identifier. Any item can have a name and this name will usually come from the original CAD package that the model was created in.

Item Type

Every item in NavisWorks has a type. Examples of types are reference files, layers, instances (sometimes called inserts) and groups. Every CAD package also has a number of geometry types, for example, polygons, 3D Solids and so on.

Selection Resolution

The selection resolution is the level in the selection tree you start selecting at. You can cycle through items in the tree by holding down the shift key during a selection.

User Name and Internal Name

Each category and property name has two parts - a user visible string which is localized and an internal string which isn't and is mainly used by the API. By default when matching names in the Smart Tags and Find Items dialogs, both parts must be the same, but you can use the flags to match only on one part. You might use **ignore user name** if you wanted to match something irrespective of which localized version was being used.

Viewpoint Terminology

Angular Speed

The speed that the camera moves when turning right and left in any navigation mode.

Aspect Ratio

Aspect ratio is the proportion of x-axis to y-axis size. For example, in exporting a bitmap of a viewpoint, maintaining the aspect ratio would keep the proportion of the view even if the number of pixels was different.

Anti-aliasing

Anti-aliasing improves image quality by softening the jagged edge appearance of sharp lines. 2x to 64x refers to the extra number of frames that are required for the anti-aliasing process. The greater the number of frames, the finer the effect, (with the consequent increase in rendering

	time).
Camera-Centric	Navigation modes in which the camera is moved around the model (c.f. model-centric).
Field of View	The field of view of a camera is the angle that the camera can see. A large field of view will fit more into the view, but will look distorted and a small field of view will tend to make the view more flat, tending towards an orthographic view. There are two fields of view in NavisWorks - vertical and horizontal. Editing one will change the other and the two are related by the viewpoint's aspect ratio.
Focal Point	The focal point is the position in 3D space that the camera will rotate around or zoom into in examine, orbit, turntable and zoom modes.
Model-Centric	Navigation modes in which the model is moved in front of the camera (c.f. camera-centric).
Roll	The roll of the camera is its angle around the viewing axis. This cannot be edited in a navigation mode where the world up vector stays upright (walk, orbit and turntable).
Saved Attributes	Each viewpoint can optionally save the state of its hidden and "required" items, as well as any material (color and transparency) overrides. Then, on recalling the viewpoint, those same items are re-hidden, re-made required, and the materials reinstated. This can be useful in the creation of animations when dragging on viewpoints onto an empty animation.
Tilt Angle	This is indicated in the scene's units below (negative) or above (positive) horizontal (0) at the base of the tilt bar.
World Up Vector	The direction that NavisWorks considers "up" is called the "world-up vector". This is maintained in the walk, orbit and turntable modes.

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