

Questions and Answers

Autodesk® Navisworks® Manage software helps enable designers, engineers, and contractors to visualize and review the design project before it is built, helping to minimize design coordination and schedule errors between the teams.

The Autodesk Navisworks software product family helps to improve productivity and quality on commercial building projects and industrial facility development. A comprehensive 3D project review solution for architecture, engineering, and construction professionals seeking better design validation, clearer insight, and more construction predictability. Three Navisworks project review products combine 3D design data, regardless of file format, for real-time visualization, dynamic simulation, and faster analysis of entire 3D projects. Autodesk® Navisworks® Manage software provides a powerful, yet easy-to-use toolset helps deliver precise fault-finding and interference management, 4D scheduling, and photorealistic presentation.

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1. General Product Information

1.1 What are the Autodesk Navisworks software products?

The Autodesk Navisworks software product family consists of four products.

There are three project review products

1. Autodesk® Navisworks® Manage software
2. Autodesk® Navisworks® Simulate software
3. Autodesk® Navisworks® Review software

The fourth product is the viewer Autodesk® Navisworks® Freedom software that ships with the products listed above and can be downloaded from www.autodesk.com.

1.2 What's new in Autodesk Navisworks Manage 2010?

Autodesk Navisworks Manage 2010 helps improve customer productivity and workflows, and enhances collaboration by focusing on three key areas:

- **Usability:**

Users will benefit from the standard Autodesk® SteeringWheels® tool and Autodesk® ViewCube® navigation widget, helping increase navigation efficiency, which is a fundamental Navisworks task.

The ViewCube:

This is an on-screen cube-shaped widget that rotates as you orbit your 3D scene and provides you with feedback about your current camera viewing angle in relation to the model world.

The ViewCube also provides a clickable interface to switch between views. For example, clicking on the front of the ViewCube will turn the scene until you are facing the front of the model. The ViewCube can also be dragged to rotate the model.

Once you have clicked on a corner, face, or edge of the ViewCube, an animated view transition is performed smoothly taking you from the current viewpoint to the new position and orientation.

SteeringWheels:

SteeringWheels are task-based floating tool palettes that travel with the cursor to minimize tool access time. Tools are grouped into various wheels depending on the navigation task and user skill level.

In-view Measurements:

Autodesk Navisworks 2010 displays measurements directly in the scene view. This helps increase efficiency as you no longer need to go to the Measure Tools control bar to read your result.

- **Workflow:**

A number of functional improvements have been made to the measurement and sectioning tools, which help to both save time and increase accuracy. CSV Import and Export support has been added to TimeLiner, allowing schedule modifications to be exported out of Navisworks. A number of enhancements to Clash Detective

make it easier to identify the location of clashes, and also improve management of results.

Measure Shortest Distance:

This new feature allows you to take more accurate measurements between two objects, without needing a vertex to snap to. This allows you to more quickly select two objects and at the push of a button, Navisworks will calculate the shortest distance, regardless of object complexity.

Measure Between Centerlines—Utilize the Benefit of Parametric Cylinders:

Many engineers require measurements to be taken from the centerlines of pipes. Navisworks does not always display a centerline, however these can be calculated for parametric cylinders.

When using the measure shortest distance feature, measurements will be taken from centerlines when available and display a centerline icon.

Measurements As Redlines:

Having taken a measurement, it can now be converted into a redline and saved with a viewpoint. Multiple measurements can be stored in this way on the same viewpoint. This could be used to provide necessary dimensions for the positioning of a piece of equipment, for example, which could help reduce the need for plotted paper drawings.

Section Box and Align Section Plane

The new Section Box tool allows you to automatically add six section planes, revealing only those objects within the box.

You can set the dimensions of the section box, and then iteratively move the box around the project site, until you have reviewed the whole model.

When using individual section planes to more quickly and accurately position the plane, there is now an Align to Plane option. This allows you to click on any object face and the section plane will be aligned directly to that face.

An Align to Line option is also available, allowing you to click on a point along a line in the model. The section plane will be aligned to that point, perpendicular to the line.

TimeLiner—Import/Export CSV Support:

CSV files created from external applications, such as Microsoft® Office Excel®, can be linked from the Navisworks TimeLiner module.

Any schedules created in TimeLiner, or modifications to linked schedules can now be exported to the common CSV format. This provides the opportunity for that data to be imported into other applications.

- **Interoperability:**

Navisworks continues to offer support for the latest 2010 versions of Autodesk design applications, including the AutoCAD® families, the Revit®-based products, and Autodesk® Inventor® software. In addition to this, support for non-Autodesk applications such as ArchiCAD® 12 have been updated, and the introduction of two new file formats, JT Open and CIS2.

The JT format is widely used in the automotive industry, and the inclusion of this in Autodesk Navisworks Manage helps allow those users to work without needing to alter their processes.

The CIS2 file reader supports the CIMSteel Integration Standards (CIS/2) adopted by the American Institute of Steel Construction (AISC) as their format for data exchange between steel related CAD software.

Updated File Readers and Exporters

- Autodesk 2010 design applications
 - AutoCAD 2010 software, AutoCAD® Architecture 2010 software, AutoCAD® MEP 2010 software, AutoCAD® Civil 3D® 2010 software
 - Autodesk® Revit® Architecture 2010 software, Autodesk® Revit® Structure 2010 software, Autodesk® Revit® MEP 2010 software
 - Autodesk Inventor 2010 software
 - Autodesk® 3ds Max® 2010 software
- JT Open
- Graphisoft ArchiCAD 12
- Faro
- CIS2

Operating Systems

The full 64-bit versions of Autodesk Navisworks software provide users with access to the increased performance and memory available from 64-bit operating systems. This provides the opportunity to handle even larger project datasets.

Additional New Features

There are a host of other new features and enhancements in our Autodesk Navisworks 2010 software, and this final section identifies some of the most noteworthy.

User Interface Enhancements

Fixed near and far clipping planes

A new manual override option allows you to specify the distance of near and far clipping planes. This can create the effect of having dynamic section planes that update as you move around the model. It can also help you avoid display problems when viewing large models or when your viewpoint is in close proximity to surrounding geometry.

Artificial horizon

You can now place your model against a fixed artificial horizon so that it appears more realistic and does not float in midair. The background of the scene view is split across the horizontal plane giving the effect of a sky and the ground. The resulting artificial horizon gives you an indication of your orientation in the 3D world.

Button menus

Some toolbar buttons exist in mutually exclusive groups of which only one at a time can be selected. These buttons are now grouped under drop-down menus to improve accessibility and decrease interface clutter.

Site and project folder assignment at install

You can now configure site and project folders at install time, making deployment across an organization easier. These folders provide a shared working environment, from workspaces to Global Options.

Core Product Enhancements

Communication Center

This allows the Autodesk Navisworks team to notify you of product related updates and announcements. This can include information on:

- Product support
- Subscription announcements
- Articles and tips
- Maintenance patches
- Featured technologies and content

Auto-save and recovery

The option of automatically saving a backup of your work at regular intervals using the Auto-save tool has been added. Now, should an application error occur, these backup files can be used for automatic recovery.

New style Help documentation and content

The Help documentation has been updated in both style and content, making it easier to locate information and also providing concepts to better understand why and how features are used.

2. Technology

2.1 Is there an API for extending Autodesk Navisworks?

Autodesk Navisworks offers an API (application programming interface) to help allow the customization of Navisworks products.

2.2 What can I do with the Autodesk Navisworks API?

The API is designed to maximize the customization possibilities of Navisworks and minimize the constraints upon using it creatively. The potential of the API to automate, augment, assimilate, and create Navisworks functionality is will developed that it can help make implementation easier. Examples of API use are listed below to illustrate its capabilities:

1. Put an interactive version of your design model on a website, helping to increase access and aid understanding of the design.
2. Link models to an external database to bring up extra information about the selected object within Navisworks, helping to make your model a more powerful and intuitive way to access design, build, and operational data.
3. Automate the process of compiling your latest set of drawings into a Navisworks model and producing clash reports, so it can be scheduled to run each night, using Navisworks to help increase your efficiency.
4. Embed an interactive 3D window into your own application, to allow the user to explore a design, outputting snapshots to picture files or saving viewpoints back into Navisworks, allowing you to use the Navisworks 3D interface as an intuitive GUI component.

5. Output a HTML report of all drawings used in a model with images of all redlining and clash results and any associated comments, giving you the ability to produce customized output to better suit your business practices.

2.3 What does the Autodesk Navisworks API comprise of?

The API currently consists of four main components, each tailored to suit different requirements:

Automation

Giving you better control to perform common functions within Navisworks, this component allows you to automate your usage of our software. Capabilities include opening and saving models, viewing animations, applying materials, and performing clash detection tests.

Plug-ins

The plug-in component of our API is more powerful and versatile, helping enable you to extend the functionality of Navisworks by adding new features that make use of our software's interactive 3D design review facilities. This includes capabilities for adding custom exporters, tools, properties, and Clash Detective rules.

ActiveX

Our ActiveX component allows you to integrate the 3D capabilities of Navisworks into your own applications and web pages, giving you powerful 3D demonstration and interaction capabilities without the time/costs associated with producing your own 3D graphics engine.

NWCreate

If you work with your own propriety 3D file format or any other format not currently supported by Navisworks, NWCreate gives you the facilities to help write your own file reader to work within Navisworks or to help create an exporter to run from within your own software.

2.4 What do I need in order to use the Autodesk Navisworks API?

Written primarily by developers for developers, it is essential to have a developer or development team with basic to intermediate knowledge of one of the supported programming languages.

The Automation, Plug-ins and ActiveX API is accessed through a Windows COM (Component Object Model) interface, and so any language that supports COM can use it. These include C, C++, Visual Basic, Visual Basic Script (VBS), and Delphi, however our examples and documentation are mostly aimed at Visual Basic users.

The NWCreate API is accessed through a stdcall C or C++ interface. C++ is the preferred language, but any language that supports stdcall interfaces can use it. These include Visual Basic, and C# through P/Invoke.

2.5 How do I get the Autodesk Navisworks API?

Our API is already included with Navisworks products. The API is installed by default into the Navisworks installation directory.

The API directory includes documentation and examples to help you get started.

3. Installation, Configuration, and Licensing

3.1 What are the hardware and system requirements?

The recommended hardware and operating system requirements for running Autodesk Navisworks software are:

Hardware/Software	Requirement
Operating System	Windows Vista® 32-bit Enterprise, Business, Ultimate, Home Premium (SP1) Windows Vista 64-bit Enterprise, Business, Ultimate, Home Premium (SP1) Windows® XP Professional, Professional x64, Home Edition, (SP2 and SP3)
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, 1,024 x 768 VGA, True Color (minimum) 256 meg or greater, 1,280 x 1,024 32-bit color video display adapter, True Color (recommended)
Hard Disk	Installation 800 MB
Pointing device	Microsoft-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

Please ensure that you have read these requirements before making your purchasing decision.

3.2 Can Autodesk Navisworks software application take advantage of a 64-bit environment?

Yes.

3.3 Does Autodesk Navisworks software work in a Windows Vista environment?

Yes

4. Compatibility and Interoperability

4.1 What file formats and applications are supported by Autodesk Navisworks software products?

Navisworks has its own native file formats (NWD, NWF, NWC), however Autodesk Navisworks software can additionally read a combination of many popular 3D CAD formats. The following table lists the CAD file formats currently supported by Autodesk Navisworks Manage 2010, Autodesk Navisworks Simulate 2010, and Autodesk Navisworks Review 2010 software products.

Format	Extension
Navisworks	.nwd .nwf .nwc
AutoCAD	.dwg, .dxf
MicroStation® (SE, J, V8, and XM)	.dgn, .prp, .prw
3D Studio	.3ds .prj
ACIS® SAT	.sat
DWF™	.dwf
PDS Design Review	.dri
IFC	.ifc
IGES	.igs .iges
Inventor	.ipt .iam .ipj
Informatix MicroGDS	.man .cv7
RVM	.rvm
SketchUp®	.skp
JT	.jt
CIS/2	.stp
STL	.stl

VRML	.wrl .wrz
STEP	.stp .step

Supported Laser Scan Formats

The following table details the laser scan formats currently supported by Autodesk Navisworks Manage 2010, Autodesk Navisworks Simulate 2010, and Autodesk Navisworks Review 2010 software products.

Format	Extension
ASCII Laser File	.asc .txt
Faro	.fls .fws .iQscan .iQmod .iQwsp
Leica®	.pts .ptx
Riegl	.3dd
Trimble	Native file <i>not</i> supported. Convert to ASCII laser file.
Z+F	.zfc .zfs

Supported Scheduling Software

The following table details the project scheduling software and formats supported by Autodesk Navisworks Simulate 2010 and Autodesk Navisworks Manage 2010.

Developer	Product	File Format	Notes
Asta	Powerproject 8 to 10	.pp	Requires Asta Powerproject to be installed on same machine, to make link.
Microsoft	Project 2000 to 2007	.mpp	Requires Microsoft Project to be installed on same machine, to make link.
Primavera	ProjectPlanner (P3)	n/a	Requires P3 to be installed on same machine. The file format is not read directly. Instead, TimeLiner logs into P3 and retrieves project information.
Primavera	Primavera Engineering and Construction	n/a	Requires Primavera v4.1, 5, or 6 Engineering and Construction to be installed on same machine, along with the Primavera SDK. TimeLiner connects to the Primavera database via an ODBC data source link.

Microsoft	Microsoft Project Exchange Format	.mpx	Does not require any project software to be installed. This is the common project exchange format that can be exported to and from a number of scheduling packages.
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4.2 Is Autodesk Navisworks software compatible with earlier versions?

Yes

4.3 Will third-party applications work with the current version of Autodesk Navisworks software?

Your existing third-party applications may or may not be compatible with the current version of Autodesk Navisworks software. Contact your third-party software supplier for details.

5. Consulting, Training, and Support

5.1 Where can I find technical support information for Autodesk Navisworks software?

You can learn about support options from your local Autodesk Authorized Reseller. Visit www.autodesk.com/support to find a knowledge base of commonly asked support questions. Autodesk software manuals and documentation are also a great source of answers to your support questions.

In addition, Autodesk® Subscription customers can get access to direct web support. One-to-one online communication with Autodesk support technicians provides fast, complete answers to your installation, configuration, and troubleshooting questions. For more information about Autodesk Subscription, contact your Autodesk Authorized Reseller or visit www.autodesk.com/subscription.

5.2 What are my options for training?

Check with your local Autodesk Authorized Reseller. To locate a reseller, visit www.autodesk.com/reseller.

Training courses may also be offered through Autodesk Consulting, custom training to match your organization's specific needs. To obtain more information about Autodesk's training services, visit www.autodesk.com/training.

You can also enroll in instructor-led training at Autodesk Authorized Training Center (ATC®) sites around the world. These training centers use Autodesk Official Training Courseware (AOTC) to deliver comprehensive courses for new and intermediate Autodesk Navisworks users. To learn more, visit www.autodesk.com/atc.

6. Subscription

6.1 What benefits do I get by subscribing to the Autodesk Navisworks?

Autodesk Subscription is the best way to keep your software tools and learning up to date. For an annual fee you get any new upgrades of your Autodesk® software and any incremental product enhancements, if these are released during your Subscription term, as well as self-paced training options, access to Subscription-only extensions, and a broad range of other technology and business benefits.

With Autodesk Subscription, you can take advantage of Autodesk e-Learning. Its concise, self-paced online lessons are designed to address crucial application functions and industry practices. Experts in their respective industries developed the lessons to challenge and enhance your existing knowledge. By the end of each 15- to 30-minute lesson, you will have worked with the content, demonstrated your knowledge, and have access to the files used in each exercise. E-Learning may not be available in all languages.

Autodesk Subscription also includes direct web support. You have access to one-to-one online communication with Autodesk support technicians, so you can quickly get complete answers to your installation, configuration, and troubleshooting questions. Web and email communications deliver support straight to your desktop. Plus, you have web access to your account through the Subscription Center, so you can track and manage questions and responses.

For more information about Autodesk Subscription, contact your Autodesk Authorized Reseller or visit **www.autodesk.com/subscription**.

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