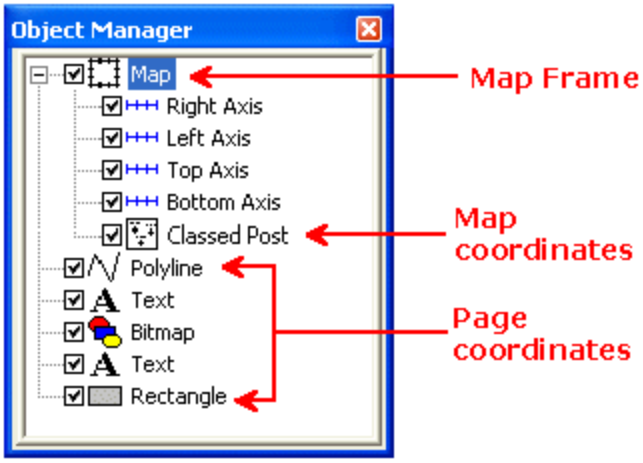
DataPOINTS
A Newsletter for Users of Golden Software Products

Issue 48

Surfer: Converting Drawn Objects from Page Coordinates to Map Coordinates

Surfer uses two sets of coordinates to keep track of objects - map coordinates and page coordinates. Maps, which are always contained within a map frame, are stored in map coordinates. Objects drawn with the drawing tools (lines, polygons, text, etc.) are stored in page coordinates.

Since drawn objects are anchored to the page using page coordinates, they do not move if the map is rescaled or repositioned. It is possible, however, to convert the drawn objects into map coordinates and overlay them into the map frame.



Maps are objects within a map frame and use map coordinates. Drawn objects use page coordinates.

To convert an object from page coordinates to map coordinates, export the drawn objects to a DXF file using map coordinates, load the DXF file as a base map, and overlay with your other maps.

Exporting drawn objects to a DXF file is a two step process. First, export the map to a DXF file and save the map coordinates. Next, export the drawn objects to a DXF file using the saved coordinates.

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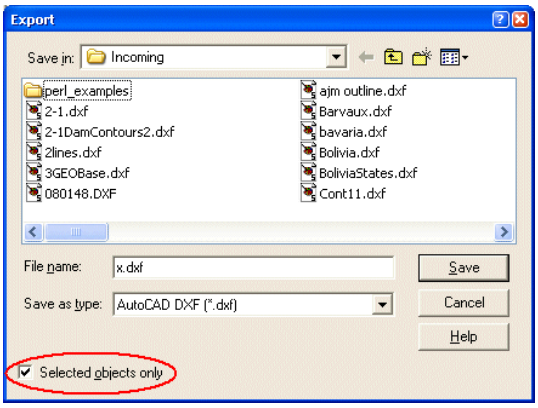
Surfer Drawn Objects (Continued):

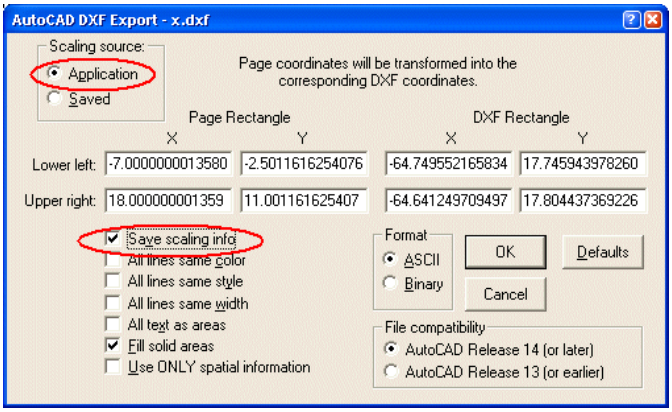
Step-by-step procedure

1. Click on the map to select it. The status bar should then indicate that a single map is selected.
2. Choose the **File | Export** menu command.
3. Specify a DXF file name in the **Export** dialog box.



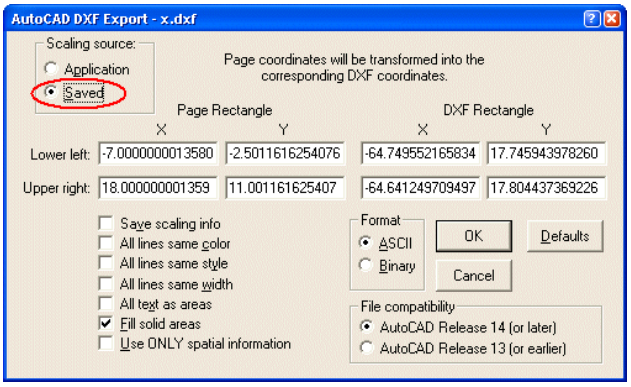
Select the map, choose ***File | Export****, specify a DXF file name, enable the* Selected objects only *check box, and click* Save*.*

4. Click the check box to enable the *Selected objects only* option.
5. Click the *Save* button.
6. In the **AutoCAD DXF Export** dialog box, make sure the *Scaling source* is set to *Application*.
7. Verify that the coordinates in the *DXF Rectangle* section are different than those in the *Page Rectangle* section.
8. Click the check box to enable the *Save scaling info* option.
9. Click OK.
10. In the plot window, deselect the map and select all the drawn objects using the **Edit | Invert Selection** menu command.
11. Choose the **File | Export** menu command.
12. Specify the DXF file name in the **Export** dialog box.
13. Click the check box to enable the *Selected objects only* option.
14. Click the *Save* button.
15. In the **AutoCAD DXF Export** dialog box, verify that the *Scaling source* is set to *Saved*.



When exporting the map to a DXF file, verify that the Scaling source *is set to* Application*, and click the check box to* Save scaling info*.*

15. Verify that the coordinates in the *DXF Rectangle* section are different than those in the *Page Rectangle* section.
16. Click OK.
17. Load the DXF file as a base map.
18. Select the maps (**Edit | Select All**) and choose **Map | Overlay Maps**.



When exporting the drawn objects to a DXF file, change the Scaling source to Saved.

Automating the process

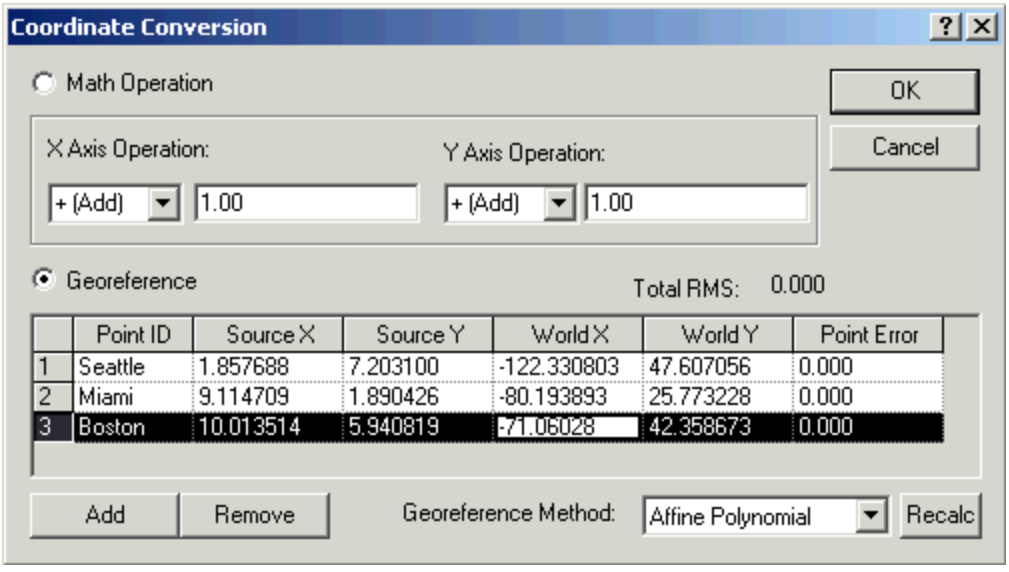
A rudimentary script to automate this process has been written and is available for download from ftp://ftp.goldensoftware.ws/public/scripts/surfer7/Export2Base.bas. It handles the case where there is one map frame, and all drawn objects are to be converted. For more complicated situations, this script could serve as the starting point for further development.

Using Didger to Convert the Coordinate System of a Vector File

Sometimes a customer, client, or colleague will send you a vector file, such as a SHP or DXF file, in a coordinate system that has no bearing on real world coordinates. You may need the file in real world coordinates in order to overlay the file with other map types. If you know the real world coordinates of any three points in the vector file, it is very easy in Didger to "recalibrate" or convert the coordinates of the file. Coordinate conversion adjusts the values of the existing coordinate system and maps them to new values.

Use the following steps to convert the coordinates of a vector file:

1. Start Didger 3 and go to **File | Import Vector**.
2. Choose the vector file (e.g. DXF, SHP, MIF, etc.) and click *Open*.
3. If it was a .DXF file, click OK in the **DXF Import Options** dialog.
4. If you know the file is projected, specify the projection in the **Define Import Options** dialog box. If it is not projected, or you do not know, accept the defaults and click OK. The file imports into Didger. However, it does not have the correct coordinates associated with it.
5. Go to **Tools | Coordinate Conversion** and select the *Georeference* radio button.
6. Click the *Add* button twice, so there are three rows in the *Georeference* section.
7. Enter the real world coordinates of three known points under the *World X* and *World Y* sections. If the file you imported is projected, the coordinates you enter must be in decimal degress of longitude (X) and latitude (Y). Didger will use these values to establish the new coordinate system.
8. Select one of the rows and digitize the point in the plot window that corresponds to the that row's world coordinates. Repeat for the other rows.
9. Select *Affine Polynomial* for the *Georeference Method* (or another method you believe is appropriate) and click OK.
10. You may need to go to **View | Project Limits** and reset the project limits and scaling.
11. Now the map is in the coordinate system you specified. You can digitize objects, resample lines, convert the projection (if applicable), or export to any of the supported formats.



Establish at least three calibration points and enter the coordinates for those points in the World X and World Y columns. When you digitize a point in the plot window, Didger will automatically enter coordinates in the Source X and Source Y columns.

Augmenting MapViewer Boundary Data with USGS DLGs

Introduction

MapViewer 5 comes with many boundary data files, such as continents, countries of the world, US states and counties, etc. However, it is common for people to supplement these boundaries with data they create themselves or acquire from other sources. Since MapViewer supports several standard geographic file formats, there are many possible sources for additional information.

One source of data in the United States is the U.S. Geological Survey (USGS). Several different types of files are available through their data download page. This article takes a look specifically at the USGS Digital Line Graph (DLG).

Digital Line Graphs (DLGs)

DLGs are digital vector representations of cartographic information derived from USGS maps and related sources. They are available at three different scales:

- Large-scale (1:24,000), which correspond to the 7.5 minute topographic quadrangle maps.
- Intermediate-scale (1:100,000), which are derived from the 30 minute by 60 minute quadrangle maps.
- Small-scale (1:2,000,000), which are derived from the USGS sectional maps from the U.S. National Atlas.

Which features are represented in the DLG depend on the scale, but can include:

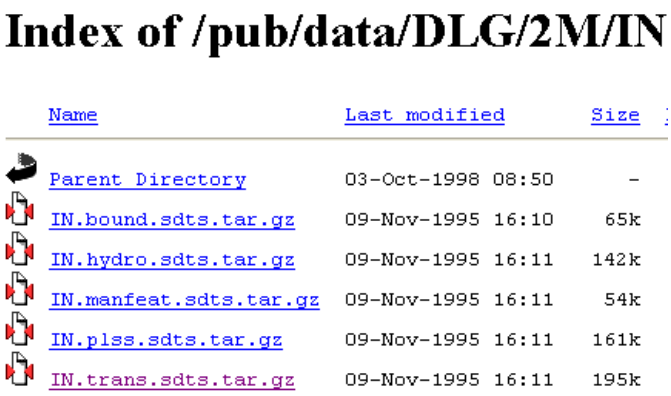
- Boundaries
- Transportation
- Public Land Survey System (PLSS)
- Hydrography
- Hpysography
- Survey control and markers
- Man-made features
- Vegetative and non-vegetative land cover

The rest of this article will explore making a MapViewer map of the roads in a single US state (Indiana) from the transportation features in a small-scale DLG.

Downloading the DLG

Begin by going to the USGS Data Download page. Buttons across the top of this page take you to the different data sets that are available.

A number of different data sets, at different scales, are available.
We want the small-scale DLG, so click on the 1:2M DLG button.
Using either the FTP via State or FTP via Graphics links, navigate to the state of interest. Choosing the state reveals a list of the files that are available for download, such as:



Five sets of DLG files are available to download for Indiana.

These files contain the boundaries, hydrography, man-made features, PLSS, and transportation features for Indiana. Roads are contained in the transportation group, so click on IN.trans.sdts.tar.gz to download this file. Save it to a folder on your system.

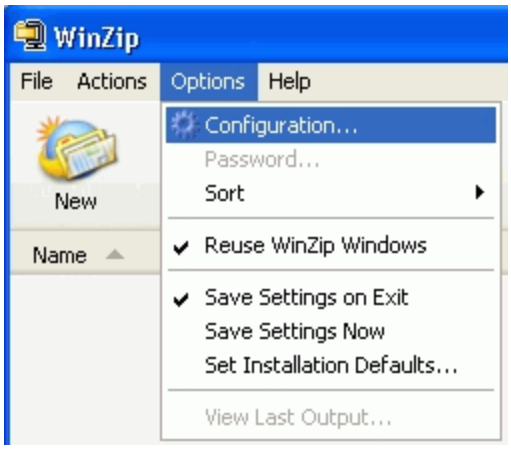
Unpacking the DLG

Note that the downloaded file ends in ".tar.gz". These are archiving and compression formats commonly used on UNIX systems to pack multiple files into one compressed archive, similar to a ZIP file on a PC. Fortunately, most PC ZIP programs, such as WinZip

Augmenting MapViewer Boundary Files (Continued)

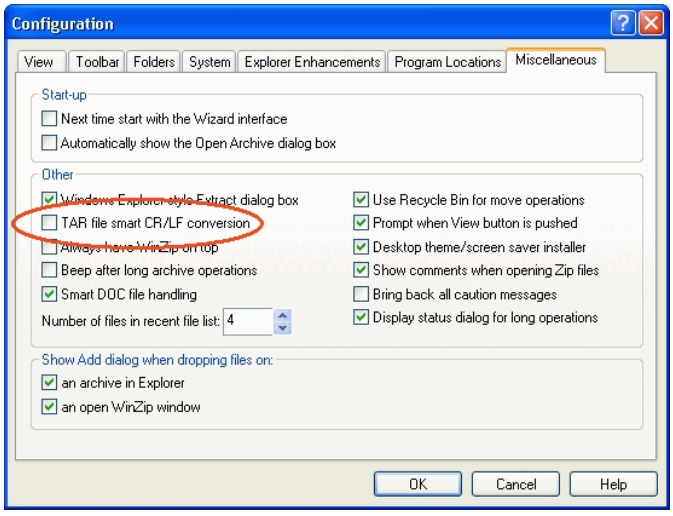
understand these formats. However, if you are using WinZip, there is an important setting that may need to be changed before unpacking the DLG.

Start WinZip and go to **Options | Configuration** on the main menu.



Check the WinZip configuration options.

Next, go to the *Miscellaneous* tab in the **Configuration** dialog. Look for the *TAR file smart CR/LF conversion* option and make sure it is NOT checked. If it is checked, then uncheck it and click OK.



Uncheck the TAR file smart CR/LF conversion *option in WinZip.*

On UNIX systems, the end-of-line in a text file is indicated by a single line-feed (LF) character. Windows uses a carriage-return / line-feed pair (CR/LF) instead. The "smart" option in WinZip converts each LF character it sees into a CR/LF pair. This is fine for text files, but not for binary data, like the DLG.

After checking the WinZip option setting, use it or another unzipping program to unpack the files from the DLG. When you do this, you will get a number of .DDF files. In the case of this Indiana transportation DLG, there are 35 .DDF files, all starting with "INTR". The information in the DLG is split up into these multiple files - all of them are needed.

Including the DLG road information in a MapViewer map

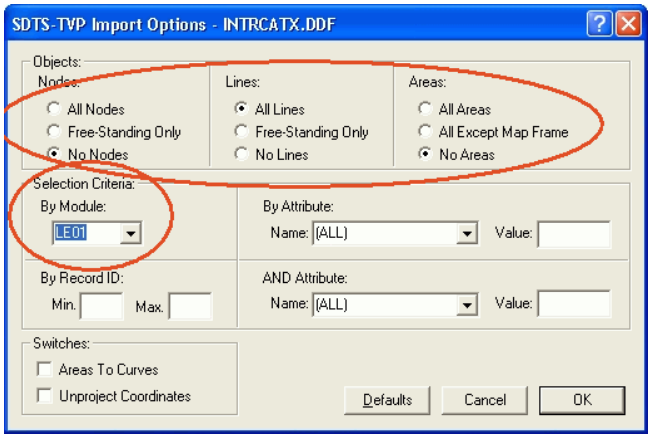
Now that the DLG has been downloaded and unpacked, we're ready to make a map of the roads in Indiana. (Incidently, Indiana is known as the "Crossroads of America".)

Perform the following steps:

1. Start MapViewer and go to **Map | Base Map** on the main menu.
2. In the **Import Boundary File** dialog, make sure the *Append image* and *Specify import options* boxes are checked, select any one of the 35 INTR*.DDF files, and click the *Open* button.
3. In the **STDS-TVP Import Options** dialog, choose *No Nodes*, *All Lines*, and *No Areas* in the *Objects* group.

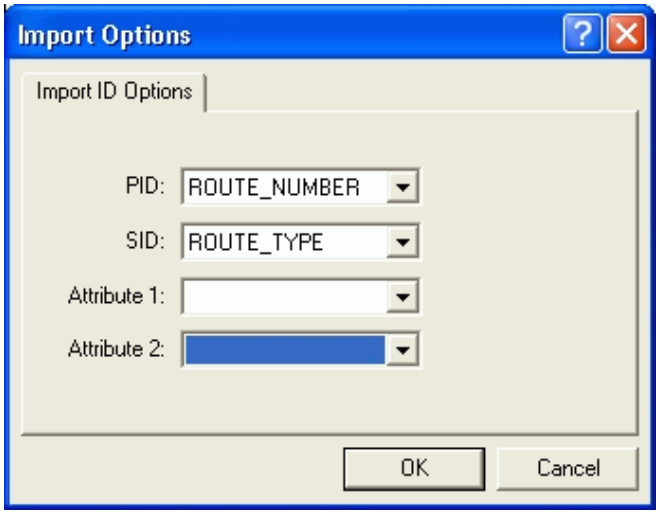
Also, in the *Selection Criteria* group, choose *LE01* from the *By Module* dropdown list. The choices in this list are different layers in the DLG. Layers starting with "LE" contain line objects. LE01 is the layer containing the roads. The **STDS-TVP Import Options** dialog should now look like:

Augmenting MapViewer Boundary Files (Continued)



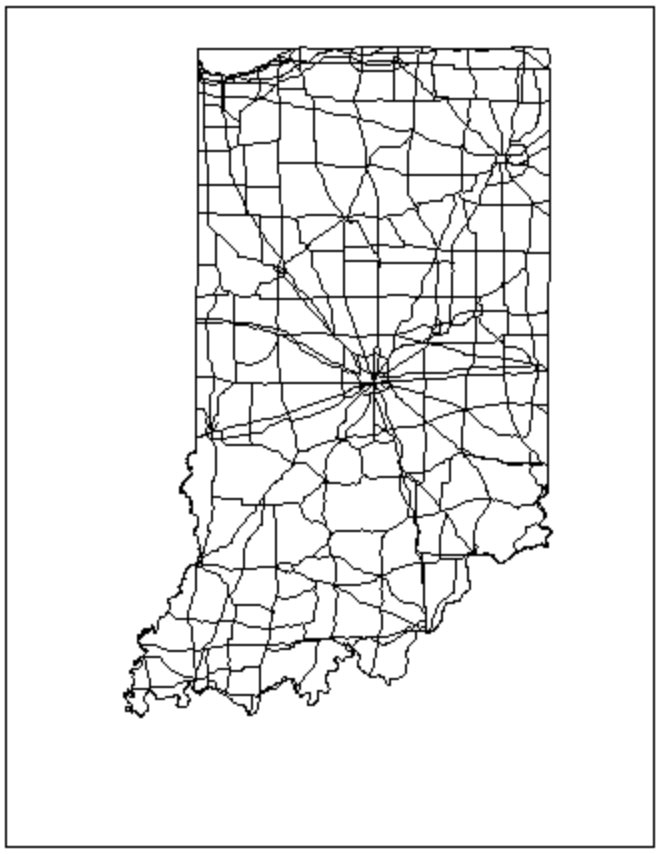
Import all lines from module LE01.

4. Click OK.
5. In the **Import Options** dialog, you can choose which data fields from the DLG to map to the MapViewer data fields (PID, SID, Attribute 1, and Attribute 2). Reasonable choices might be the *ROUTE_NUMBER* and *ROUTE_TYPE*. The other data fields in this DLG are largely blank.



Choose the mapping between DLG and MapViewer data fields.

6. Click OK to create the map.



The roads of Indiana.

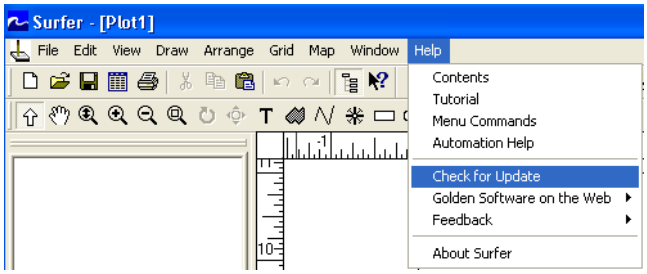
If you have any questions about MapViewer or this article, please contact us at mapviewersupport@goldensoftware.com.

MapViewer 5 is Now Shipping!

Surfer 8.03 Update Is Available

A new update to Surfer 8 is available. For a list of changes and fixes in this version, please see http://www.goldensoftware.com/surferhistory.shtml. This page lists all of the changes and fixes that have been made to Surfer 8.

To download the Surfer 8.03 update patch, start Surfer and choose **Help | Check for Update** from the main menu.



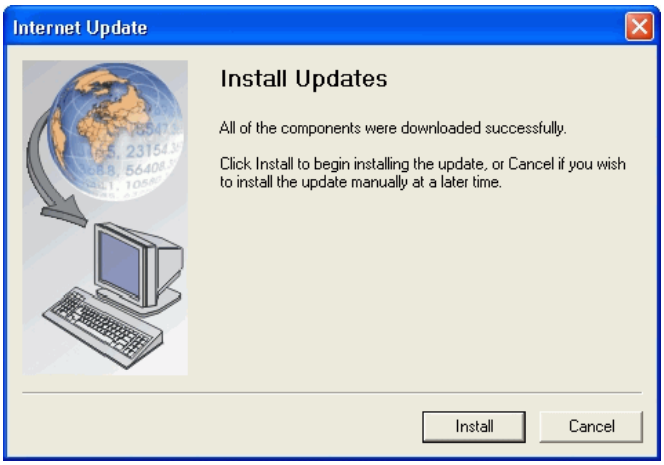
*Use **Help | Check for Update** to see if an update is available.*

In the **Internet Update** dialog, press the *Next* button once to see if you have the most recent version. Your computer will connect to Golden Software's Internet update server to check your version against the current version. If an update is available, you will see a dialog similar to this:

An update is available! Click Next to begin downloading it.

Click the *Next* button to download the update patch. The Surfer 8.03 update is fairly large (nearly 6 MB), so it may take several minutes to download.

After the file is downloaded, the dialog box will change to an installation dialog. You will need to close Surfer before starting the patch installation. After closing Surfer, press the *Install* button in the dialog. If you do not close Surfer before pressing the *Install* button, you will be prompted to do so.



The update has downloaded. Stop Surfer, then click Install.

When the patch installation has completed, press the *Finish* button. You can then reopen Surfer and continue with your work. You can verify the version of Surfer you are running by going to **Help | About Surfer**.

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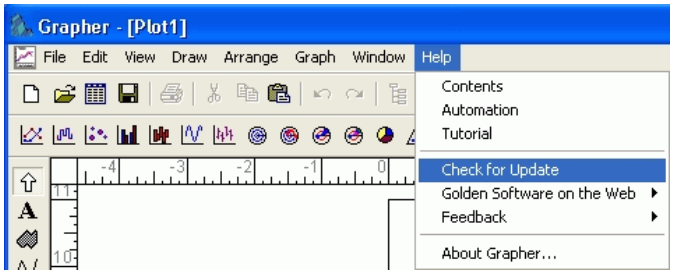
Grapher 4.02 Update is Available

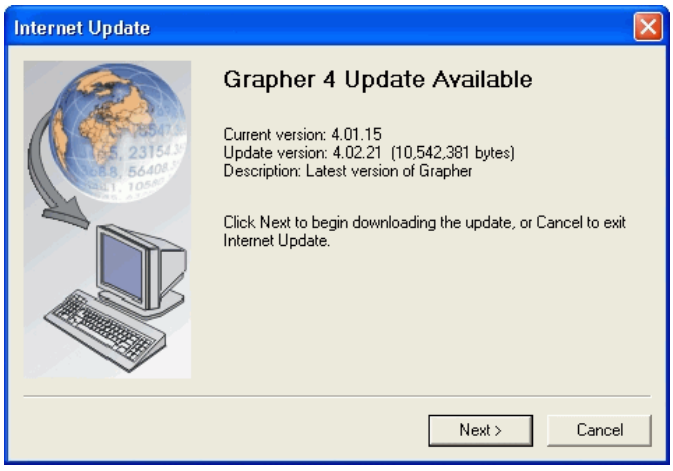
A new update to Grapher 4 s available. For a list of changes and fixes in this version, please see http://www.goldensoftware.com/grapherhistory.shtml. This page lists all of the changes and fixes that have been made to Grapher 4.

To download the Grapher 4.02 update patch, start Grapher and choose **Help | Check for Update** from the main menu.



*Use **Help | Check for Update** to see if an update is available.*

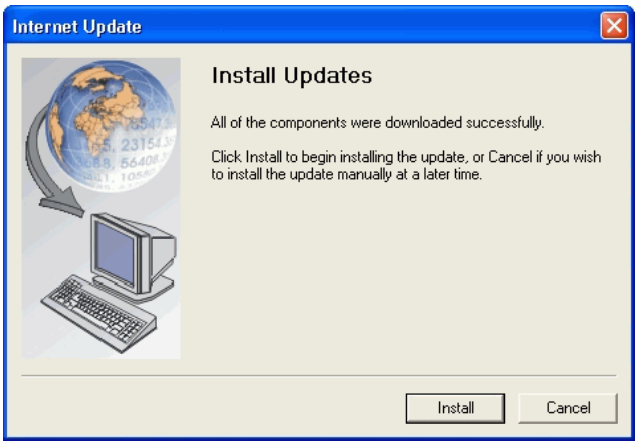
In the **Internet Update** dialog, press the *Next* button once to see if you have the most recent version. Your computer will connect to Golden Software's Internet update server to check your version against the current version. If an update is available, you will see a dialog similar to this:



An update is available! Click Next to begin downloading it.

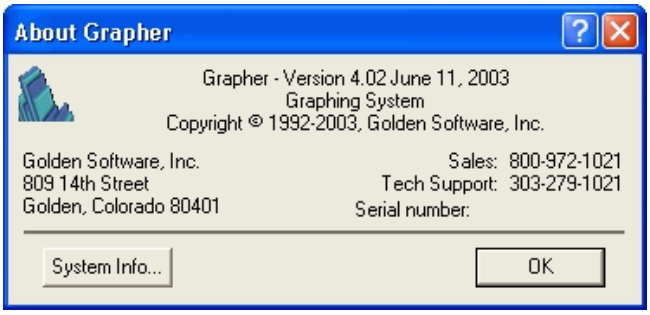
Click the *Next* button to download the update patch. The Grapher 4.02 update is fairly large (roughly 10 MB), so it may take several minutes to download.

After the file is downloaded, the dialog box will change to an installation dialog. You will need to close Grapher before starting the patch installation. After closing Grapher, press the *Install* button in the dialog. If you do not close Grapher before pressing the *Install* button, you will be prompted to do so.



The update has downloaded. Stop Grapher, then click Install.

When the patch installation has completed, press the *Finish* button. You can then reopen Grapher and continue with your work. You can verify the version of Grapher you are running by going to **Help | About Grapher**.



*Go to **Help | About Surfer** at any time to see the version you are running. You can also find your serial number or our phone numbers here.*

Grapher Update (Continued)

Some network firewalls can prevent the communication between your computer and Golden Software's Internet update server. If you have any difficulties with the above steps, you can manually download the patch. To do this, go to ftp://ftp.goldensoftware.ws/programs/grapher/GrapherUpdate40221.EXE. Save this file to your main Grapher directory. By default, this is c:\Program Files\Golden Software\Grapher4. After the file is completely downloaded, ensure that Grapher is closed and double-click on the EXE. The patch will install as above.

If you have any problems with the update, or have questions about Grapher, please contact us at graphersupport@goldensoftware.com.

Surfer Update (Continued from p. 7)

Some network firewalls can prevent the communication between your computer and Golden Software's Internet update server. If you have any difficulties with the above steps, you can manually download the patch. To do this, go to http://www.goldensoftware.com/programs/surfer/SurferUpdate803.exe. Save this file to your main Surfer directory. By default, this is c:\Program Files\Golden Software\Surfer8. After the file is completely downloaded, ensure that Surfer is closed and double-click on the EXE. The patch will install as above.

If you have any problems with the update, or have questions about Surfer, please contact us at surfersupport@goldensoftware.com.