

**Metasys® System Extended Architecture Graphics  
Stencil Library (GSL)**

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# Metasys System Extended Architecture Graphics Stencil Library

## *Introduction*

This document describes the GSL and how to use the GSL to make background drawings for Metasys® system extended architecture graphics.

This document describes how to:

- install the GSL
- use the GSL in Visio® 2002
- use the hide label and hide value boxes functions
- import an AutoCAD® file for use as a floor plan graphic
- modify an imported AutoCAD file for use as a floor plan graphic
- create a floor plan graphic from an AutoCAD file - alternate method
- import SVGZ files to the User Graphics Tool (UGT)
- bind data to a Metasys system extended architecture graphic using the UGT
- edit, copy, and paste a Metasys system extended architecture graphic value box format
- implement aliasing

In addition this document provides information on the limitations of the GSL and on improving performance when using the GSL.

## **Key Concepts**

### **Graphics Stencil Library Overview**

The Metasys system extended architecture Graphics Stencil Library (GSL) is a set of Visio Stencils, Templates, and add-ons (including Gzip, a compression utility), used with Microsoft® Visio Professional 2002 to create graphics for use in your Metasys system. Use the GSL to create Visio Extensible Markup Language (XML) drawing files (VXD) that the GSL then allows you to convert to SVGZ. The SVGZ files created with the GSL in Visio 2002 are then imported into the User Graphics Tool (UGT) in the Metasys system extended architecture. The templates included in this library are listed in Table 1.

### **System Requirements**

To install the GSL successfully, your computer must be running Windows® 2000 Professional with Service Pack 3 (SP3) or Windows XP with SP1, Java® Runtime Version 1.3.1, and Microsoft Visio Professional 2002 software.

### **Scalable Vector Graphics**

The Scaleable Vector Graphic (SVG) file format is an XML-based Web standard and is viewable and editable within any text editor, much like Hypertext Markup Language (HTML) documents. An SVGZ file is a compressed SVG file. The World Wide Web Consortium ([www.w3.org](http://www.w3.org)) maintains the SVG specification. Although the SVG specification defines mechanisms for dynamic and animated SVG graphics, at Release 1.1 of Metasys system extended architecture, all graphic backgrounds are static images.

### **Microsoft Visio Professional 2002**

The GSL is designed to work with Visio Professional 2002. At this time only a few major drawing packages (such as CorelDRAW® software and Adobe® Illustrator® software) support SVG natively. However, Visio Professional 2002 software includes a stencil sheet mechanism that greatly enhances the ease of use of the GSL. For this reason, an add-on to Visio Professional 2002 software was created that can translate Visio Professional 2002's XML save file format into SVG XML.

Visio Professional 2002 software was selected to improve the speed of graphics generation.

## Templates and Stencils

The GSL provides a set of stencils used to create drawings in Visio Professional 2002. Each stencil consists of a set of related shapes. Several templates (Table 1) are installed with the GSL. These templates are drawings created in Visio Professional 2002 using the stencils from the GSL. The templates provide a starting point to help you create drawings quickly.

## The Template Library

The GSL has Shapes and Templates for common Air, Water and Floor Plan graphics. Table 1 contains a list of the templates installed by GSL.

**Table 1: GSL Installed Templates**

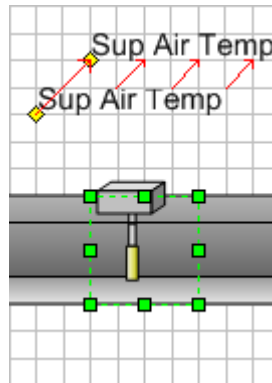
Template Name in Visio Software	Full Name of Template	Notes
Base Template	Base Template.vtx	Contains only the standard framing for Johnson Controls® graphics. All other templates are based on this template.
Base Water Template	Base Water Template.vtx	Use this template for customer Heating, Ventilating, and Air Conditioning (HVAC) water graphics.
1ChlrCWS	1ChlrCWS.vtx	
1ChlrCWSFreeCooling	1ChlrCWSFreeCooling.vtx	
1ChlrPriCHWS	1ChlrPriCHWS.vtx	
1ChlrPriCHWSFreeCooling	1ChlrPriCHWSFreeCooling.vtx	
2ChlrCWS	2ChlrCWS.vtx	
2ChlrPriSecCHWS	2ChlrPriSecCHWS.vtx	
2StmHXHotWater	2StmHXHotWater.vtx	
3Boiler Hot Water	3Boiler Hot Water.vtx	
Computer Room AC	Computer Room AC.vtx	
Fancoil	Fancoil1.vtx	
Fancoil Alternate	Fancoil2.vtx	
MADP	MADP.vtx	
MASP	MASP.vtx	
Network – 50 VAVs	Network – 50 VAVs.vtx	
Network – Ethernet	Network – Ethernet.vtx	
Network – N2 Devices	Network – N2 Devices.vtx	
OADP	OADP.vtx	
OASP	OASP.vtx	
VAV Dual Duct	VAV Dual Duct.vct	
VAV Dual Duct with EC	VAV Dual Duct with EC.vct	
VAVDual Duct with HC	VAVDual Duct with HC.vtx	
VAV Parallel Fan	VAV Parallel Fan.vtx	
VAV Series Fan	VAV Series Fan.vtx	

Continued on next page . . .

Template Name in Visio Software (Cont.)	Full Name of Template	Notes
VAV Single Duct with 3WHC	VAV Single Duct with 3whc.vtx	
VAV Single Duct	VAV Single Duct.vtx	
VAV Single Duct with EC	VAV Single Duct with EC.vtx	
VAV Single Duct with HC	VAV Single Duct with HC.vtx	

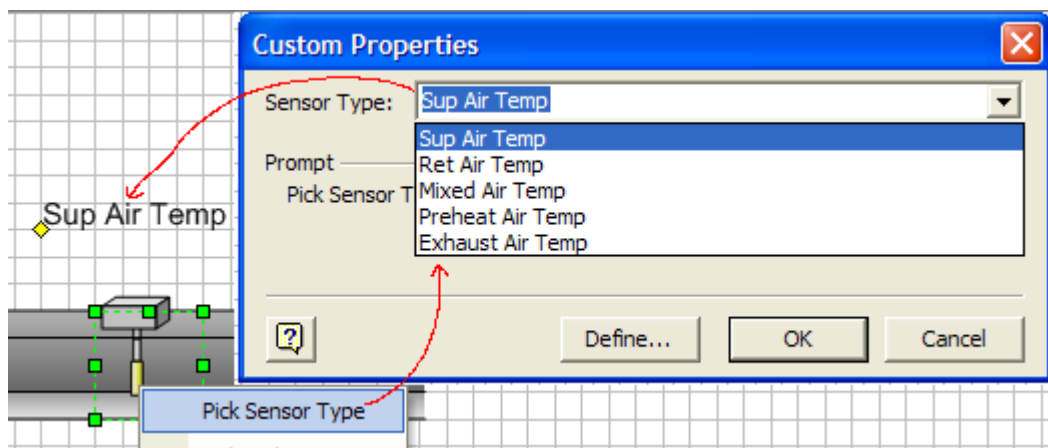
## Shapes

Each stencil consists of a set of related shapes. Many shapes have built-in labels. These labels have a control handle (the control handle appears as a yellow diamond when a shape is selected [Figure 1]) to move them around the page.



**Figure 1: Label Handle on a Shape**

Some stencil shapes have custom properties and entries on their right-click menus. The label text can generally be set using one of the custom properties (Figure 2).



**Figure 2: Custom Properties on a Sensor**

## User Graphics Tool

The Metasys system extended architecture includes a User Graphics Tool (UGT) that accepts SVGs, SVGZs, or Joint Photographic Experts Group (JPG) files for background images.

Graphics provide a visual representation of the monitored systems. They enable you to quickly check the status of systems and recognize unusual conditions. You can design graphics to allow you to navigate through buildings, floors, and other areas, viewing building systems and control processes.

User graphics are usually made up of three parts:

### ***Background Image***

Backgrounds are static images displayed behind a graphic. Backgrounds can represent buildings, floor plans, mechanical equipment, and any other image that represents the location or function of the equipment in the graphic. A newly-created graphic has a gray background by default. You can insert a background image using a file based on SVG, SVGZ, or JPG graphic formats.

You can create SVG background images with graphic drawing packages or from established libraries of images. We recommend using Microsoft Visio 2002 software to create background images that can be converted to SVGZ format. SVGZ and SVG images must be created in positive drawing space (quadrant 1, on the positive X and positive Y axis).

Background images in JPG format are usually created with cameras or scanners. You cannot resize a UGT background image in JPG format, and if an area of the graphic's workspace is not fully covered by the JPG image, the exposed area defaults to gray.

### ***Symbols***

Symbols are graphic elements or components that are inserted into graphics to represent the value or status of equipment in your system. In the UGT's Edit mode, the symbols appear in a pallet to the left side of the graphic workspace.

### ***Hyperlinks***

Hyperlinks allow you to navigate to other graphics and Web addresses.

**Note:** If you are using hyperlinks to Uniform Resource Locators (URLs), you must change a setting in Microsoft Internet Explorer. In the Tools menu, click Internet Options.... On the Advanced tab, clear the check box for Reuse windows for launching shortcuts (Figure 3). If you do not clear this check box, the hyperlinked site appears in the same window as the Metasys software and the back button only takes you back to the Metasys login screen.

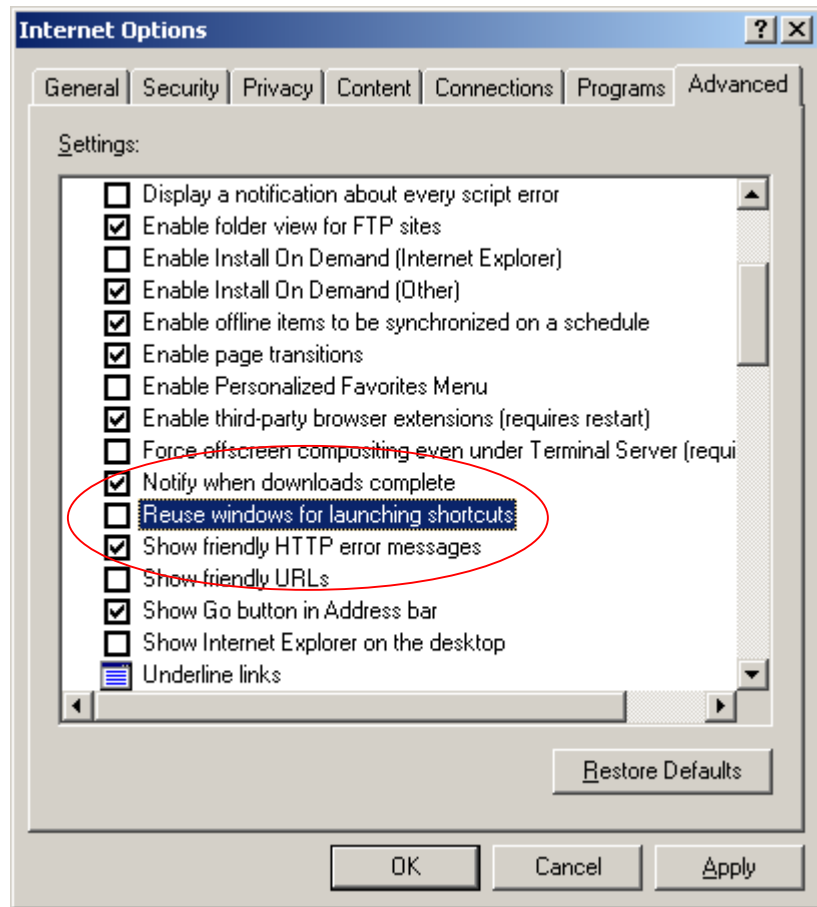


Figure 3: Internet Explorer Options - Advanced Tab

## GNU Zip (gzip)

GZIP is an open source compression utility included with the GSL to compress SVG files. The compressed files have the file extension SVGZ.

## Drawing and Template Layers

All the templates have a drawing layer and a template layer. The template layer contains the gray, blue, and black backgrounds as well as the Metasys logo. The template layer is locked by default to prevent accidental modification. The gray and blue backgrounds are hidden by default to display the grid lines. They are unhidden and re-hidden during the export process so that they appear in the SVGZ file.

Note the following:

- Visio drawings use points to emphasize that these are not scaled drawings.
- The Page size is 723 x 535 points. This design criterion was made based on the following assumptions:



- The viewing screen resolution is set to 1024 x 768 points.
- A single line Windows operating system task bar is visible.
- The user interface window is maximized.
- The Navigation Tree is attached and at its full size.
- The water side GSL shapes are scaled to snap to a five point grid. All other GSL shapes are scaled to snap to a nine point grid.

## Special Shape Functions

Many shapes have special functions that control the appearance of the shape. For example, the temperature element may be selected to display either a bulb type element or an averaging type element. In general, right-clicking on a shape reveals a menu of any special functions available. The most common special function is the Pick Sensor Type that controls the label text of the shape.

## Aliases

Aliases allow a single graphic to be used for multiple typical mechanical systems. The most common use of aliases is in Variable Air Volume Controller (VAV) graphics. The alias process changes the values displayed in the value boxes to represent the particular system desired at the moment the graphic is displayed.

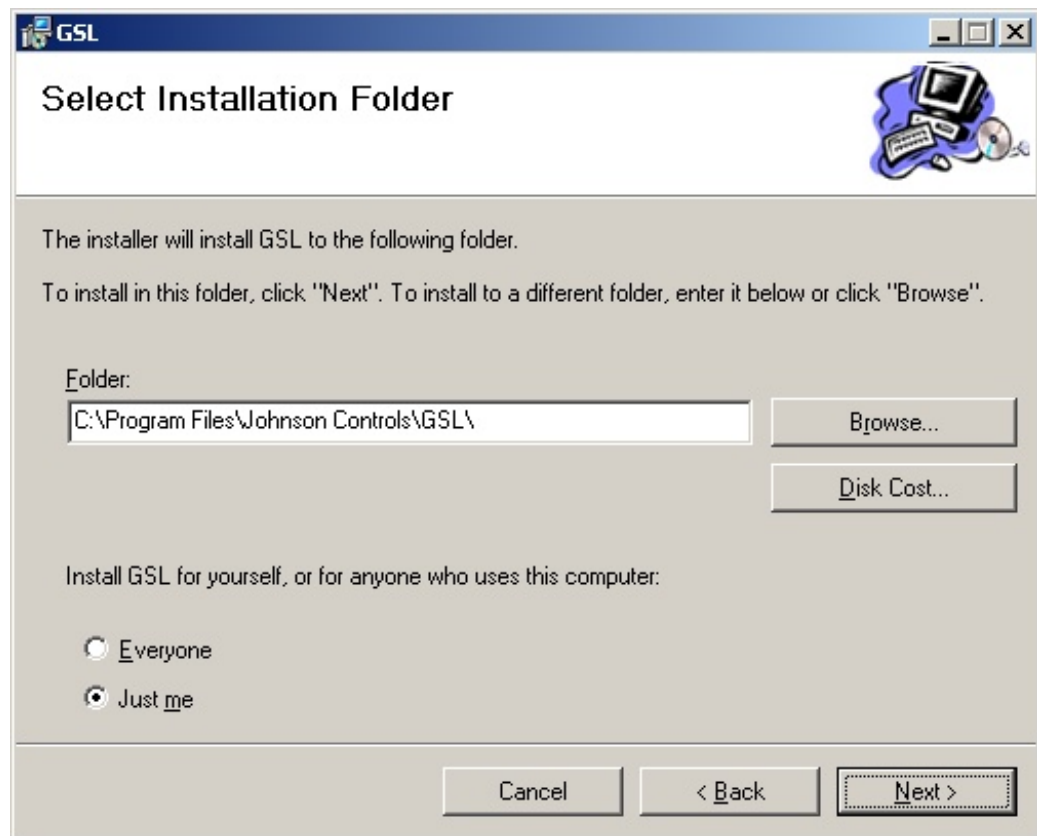
## Detailed Procedures

### Installing the GSL

To install the GSL:

**Note:** Prior to installing GSL, Visio 2002 must be installed on your computer.

1. On your install media (Branch Purchase Package), navigate to and double-click the GSL.msi file. The GSL setup wizard starts.
2. Click Next. The Select Installation Folder screen appears (Figure 4).



**Figure 4: Select Installation Folder Screen**

**Note:** If you do not want to accept the default folder for installation, click the Browse button to choose another folder.

3. Select whether the templates should be available to all users of the computer or just to you and click Next. The Installation Confirmation screen appears.
4. Click Next to start the installation. When the installation finishes, the Installation Complete Screen appears.
5. Click Finish to close.

- To confirm the installation, start Visio 2002 Professional. The Templates folder should now contain folders labeled Air, Network, and Water, which contain the Graphics Stencil Library (Figure 5).

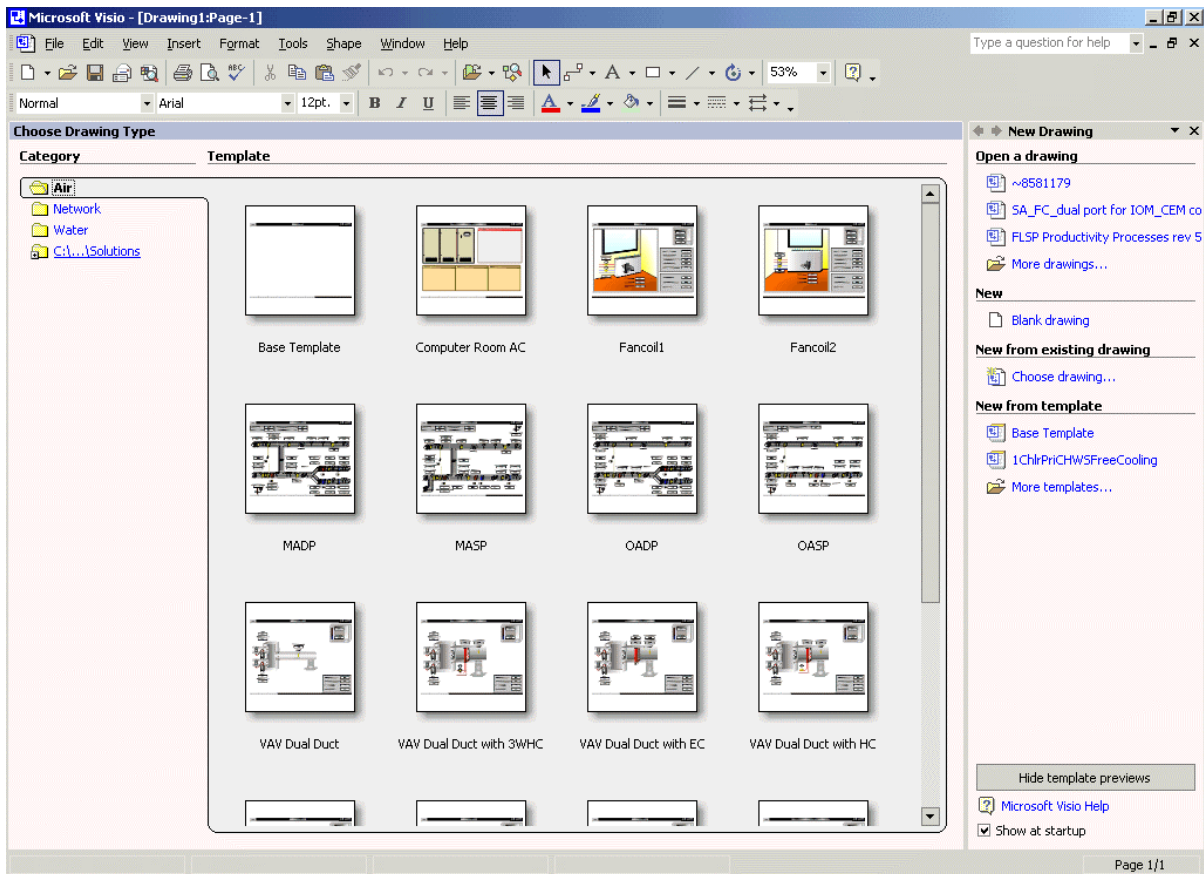


Figure 5: Visio 2002 with GSL Installed

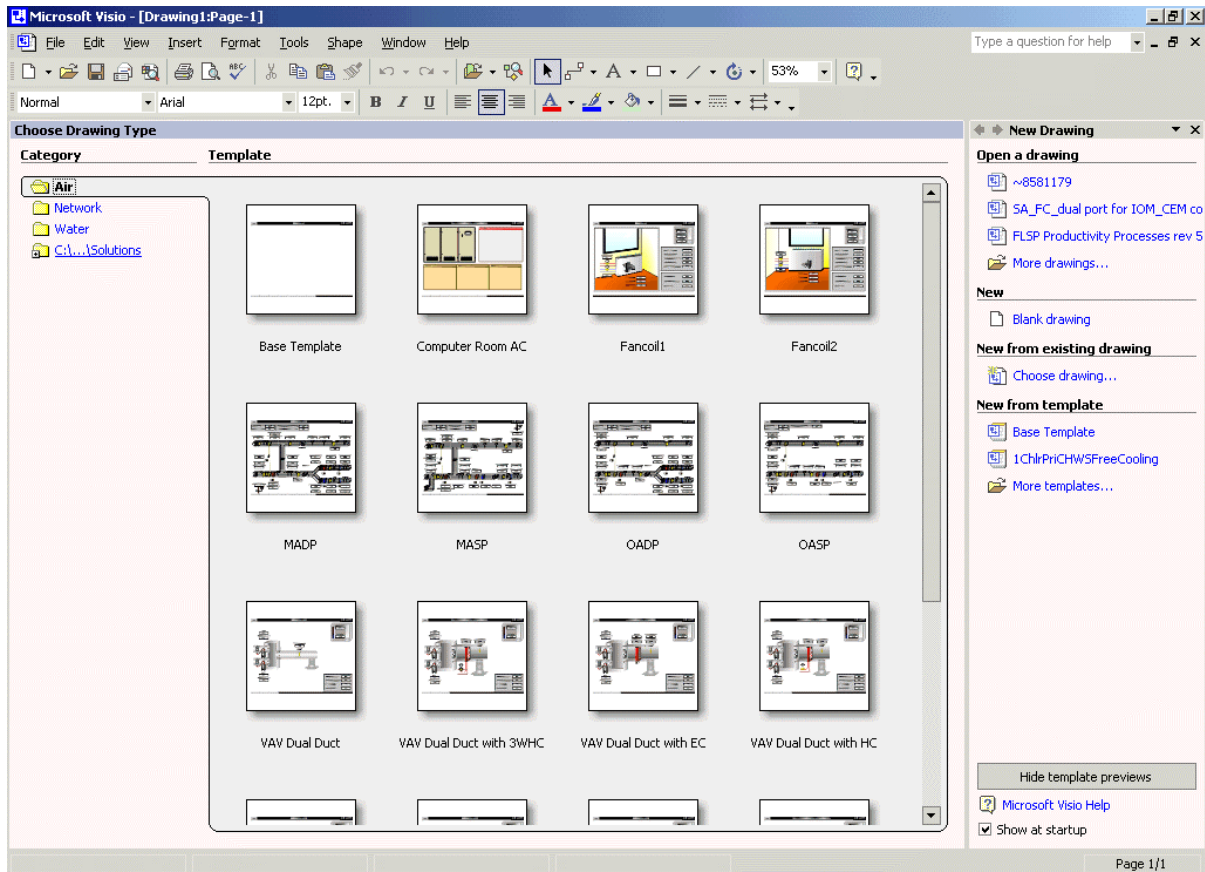
## Using the GSL in Visio 2002

**Note:** One of the benefits of using the GSL to create drawings is that you can find a preexisting template that is similar to the drawing you want to create. You then modify the existing drawing as needed. If your needs vary a great deal from the existing drawings, use the blank template to create a blank drawing which has all the GSL stencils available, along with the standard Johnson Controls' template background image.

To use the GSL in Visio 2002:

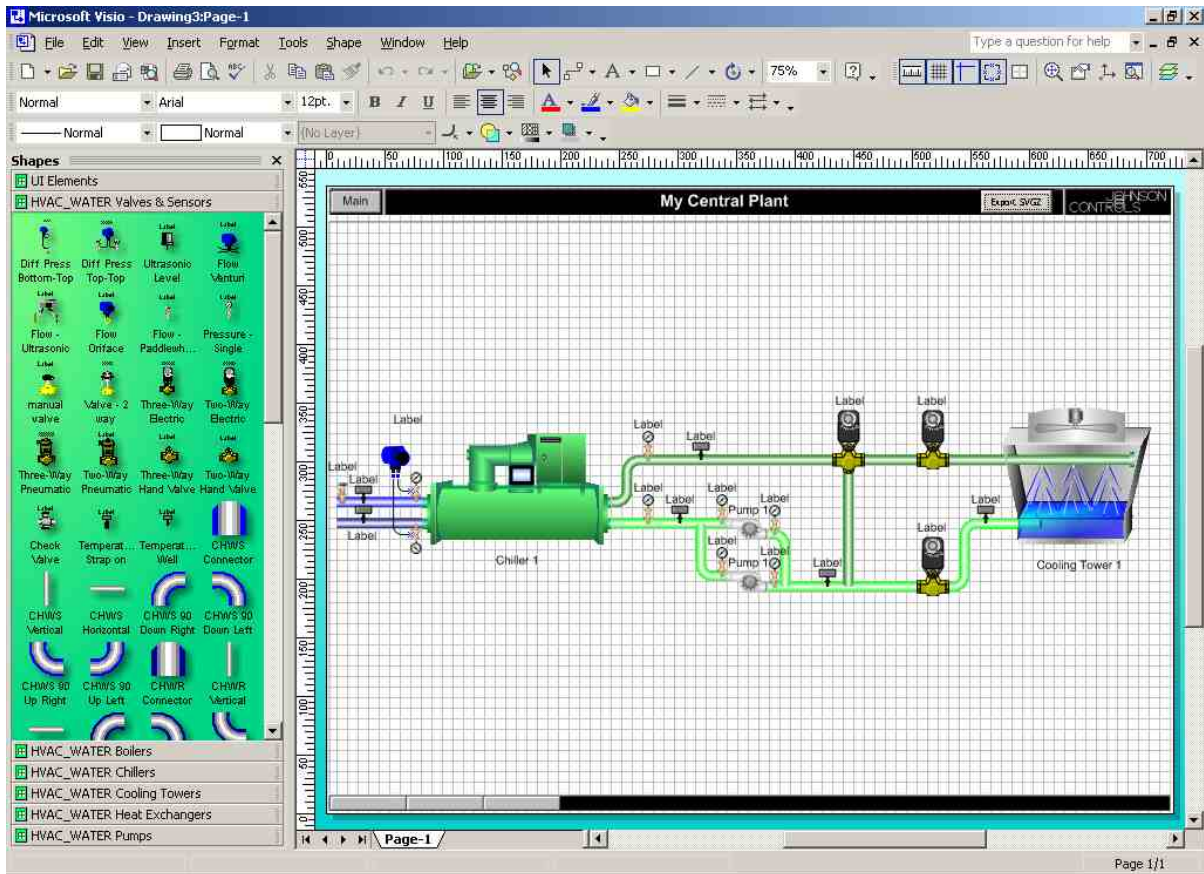
- Start Visio 2002. The Choose Drawing Type screen appears (Figure 6).

**Note:** If the macro security setting in Visio 2002 is set to Medium (default setting), a Disable/Enable Macros message appears every time you open a GSL template. Set this option to Low to disable this message (Tools > Macros > Security). Do not leave this setting at Low if other people use your machine or if this setting violates your security policies. However, you must enable macros in order for the GSL to function properly.



**Figure 6: Visio 2002 Choose Drawing Type Screen**

2. Select a GSL template to start your drawing. A new template-based drawing appears (Figure 7).



**Figure 7: New Template Based Drawing**

3. Modify the drawing as required by deleting unwanted shapes or dragging other shapes as needed from the stencils that are typically located on the left side of the Visio 2002 workspace.
4. To make the generic labels more specific, select the Text button on the tool bar and click any label you want to change.

**Note:** If you do not change, hide, or delete the labels, they appear in your final drawing as they appear in Visio 2002 software. However, when you bind data to a graphic, you are able to hide labels with data. See the *Binding Data to a Metasys System Extended Architecture Graphic Using the UGT* section in this document. Right-click on the page background to access master label and value box hide/unhide functions. There is also a graphics background hide/unhide function if you wish to edit the color of the normally hidden background. To do this, you also need to unlock the Template layer to select the background for editing.

5. When you finish modifying the drawing, click the button labeled Export SVGZ on the upper right hand side of the GSL-created drawing. This button converts your drawing to a compressed SVG file in the same directory as the drawing from which it is being exported.

**Note:** If the drawing has not been saved already, select Save As on the File menu. On the Save As type drop-down list, make sure to select XML Drawing (\*.vxd) and give the drawing a unique name.

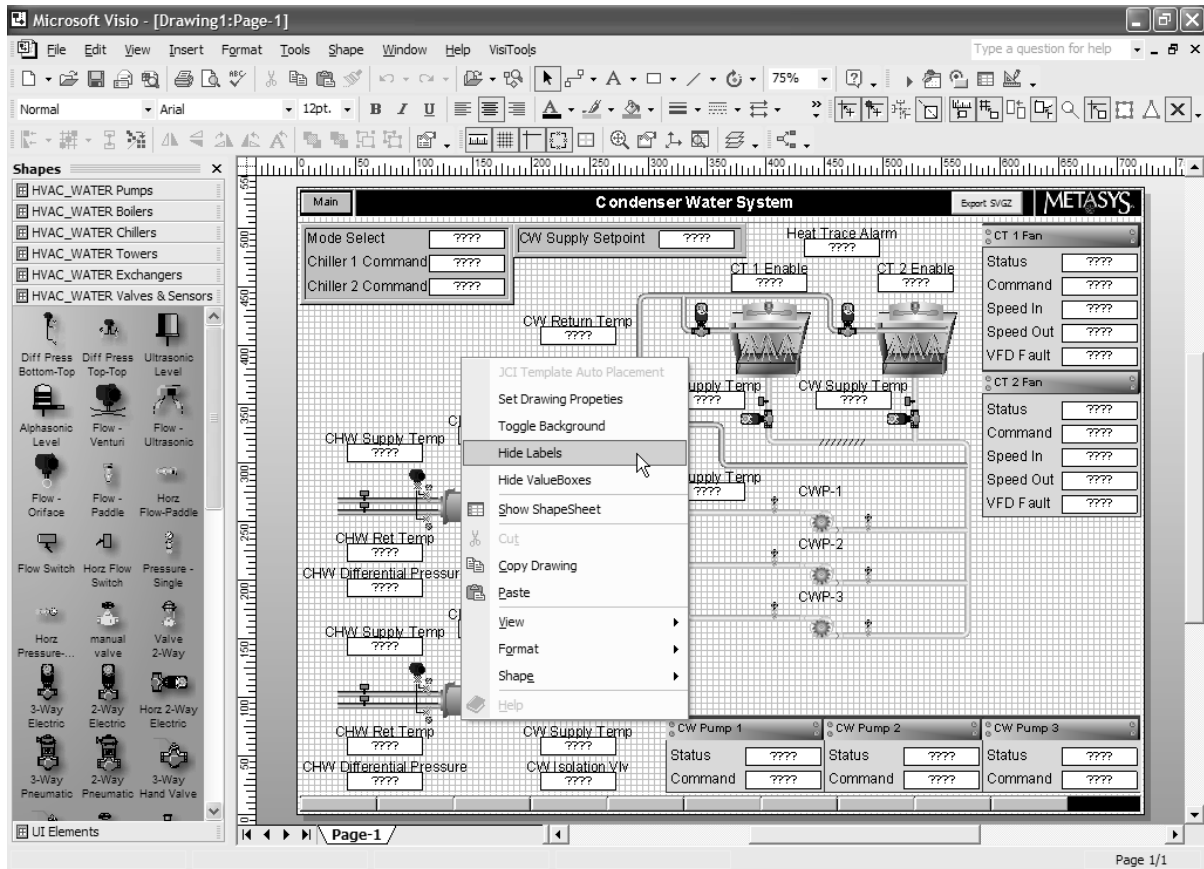
## Using the Hide Label and Hide Value Boxes Functions

At Release 1.1 of the GSL, all appropriate shapes have a label and value box symbol added to them. These indicators simplify creating descriptive text and assist with spacing issues. All labels and value boxes can be hidden in your graphic either individually or separately.

### To Hide Labels Globally

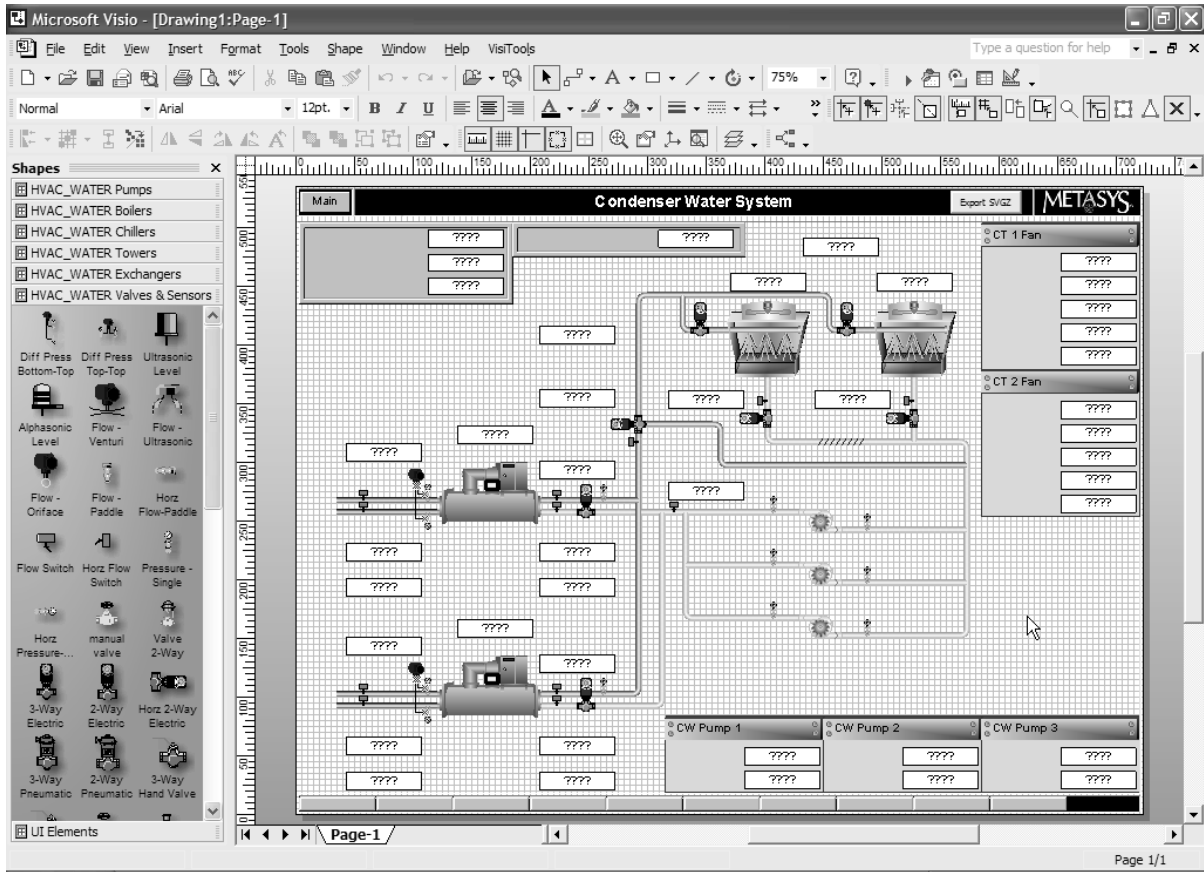
To hide labels globally:

1. With your drawing open in Visio Professional 2002, right-click on the Visio Professional 2002 drawing without selecting any shapes. The right-click menu appears (Figure 8).



**Figure 8: Visio 2002 Right-Click Menu**

2. On the right-click menu, select Hide Labels. All labels and setpoint descriptions in your drawing are hidden (Figure 9).



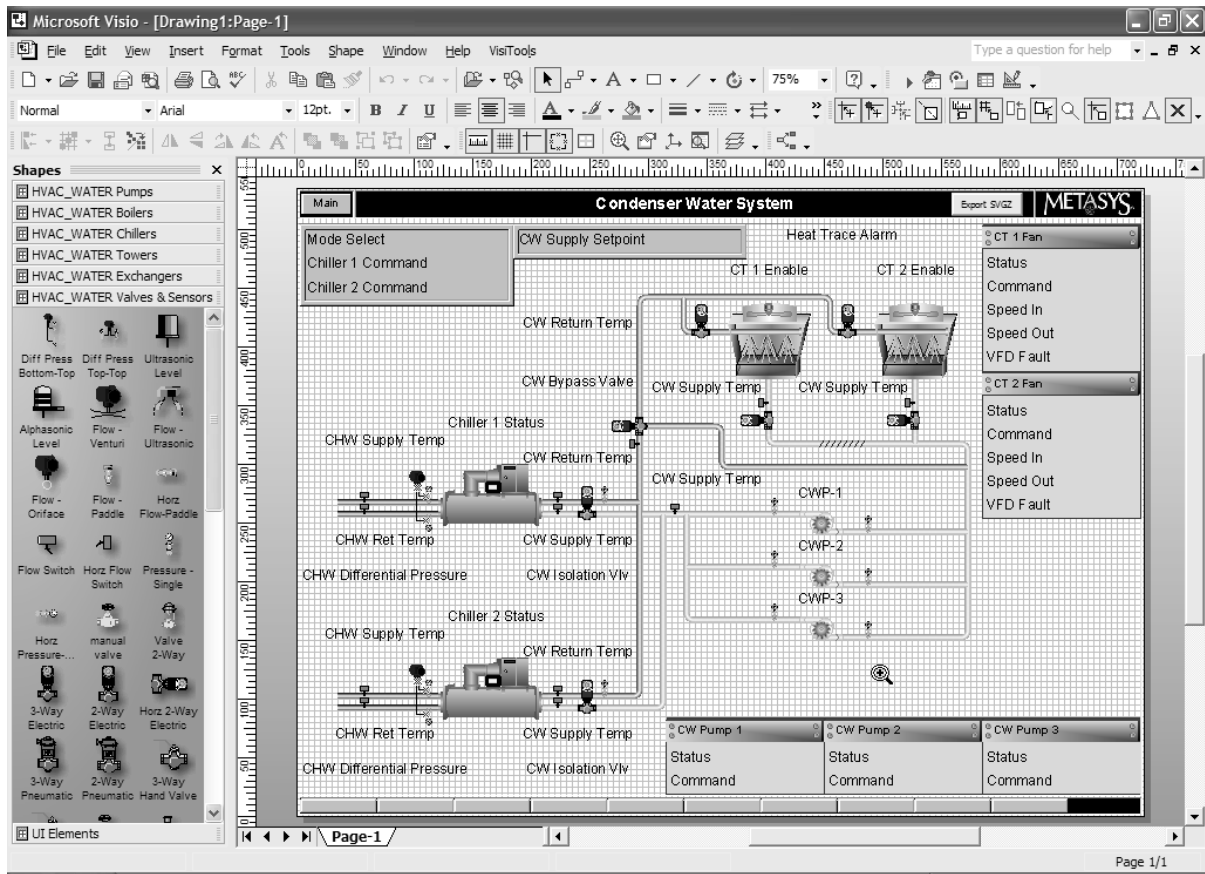
**Figure 9: Labels and Setpoints Hidden Globally**

### ***Hiding Value Boxes Globally***

To hide value boxes globally:

1. With your drawing open in Visio Professional 2002, right-click on the Visio Professional 2002 drawing without selecting any shapes. The right-click menu appears (Figure 8).
2. On the right-click menu, select Hide Value Boxes. All value boxes are hidden (Figure 10).

**Note:** If you hide the value boxes before exporting an SVGZ file, you do not have to cover Visio value boxes exactly with Metasys system extended architecture value boxes.



**Figure 10: Value Boxes Hidden Globally**

### ***Hiding Labels and Value Boxes Individually***

To hide labels and value boxes individually:

In your Visio Professional 2002 drawing, right-click on an individual shape and select Hide Label or Hide Value Box from the right-click menu. Only the selected shape's value box is hidden from the graphic (Figure 11).



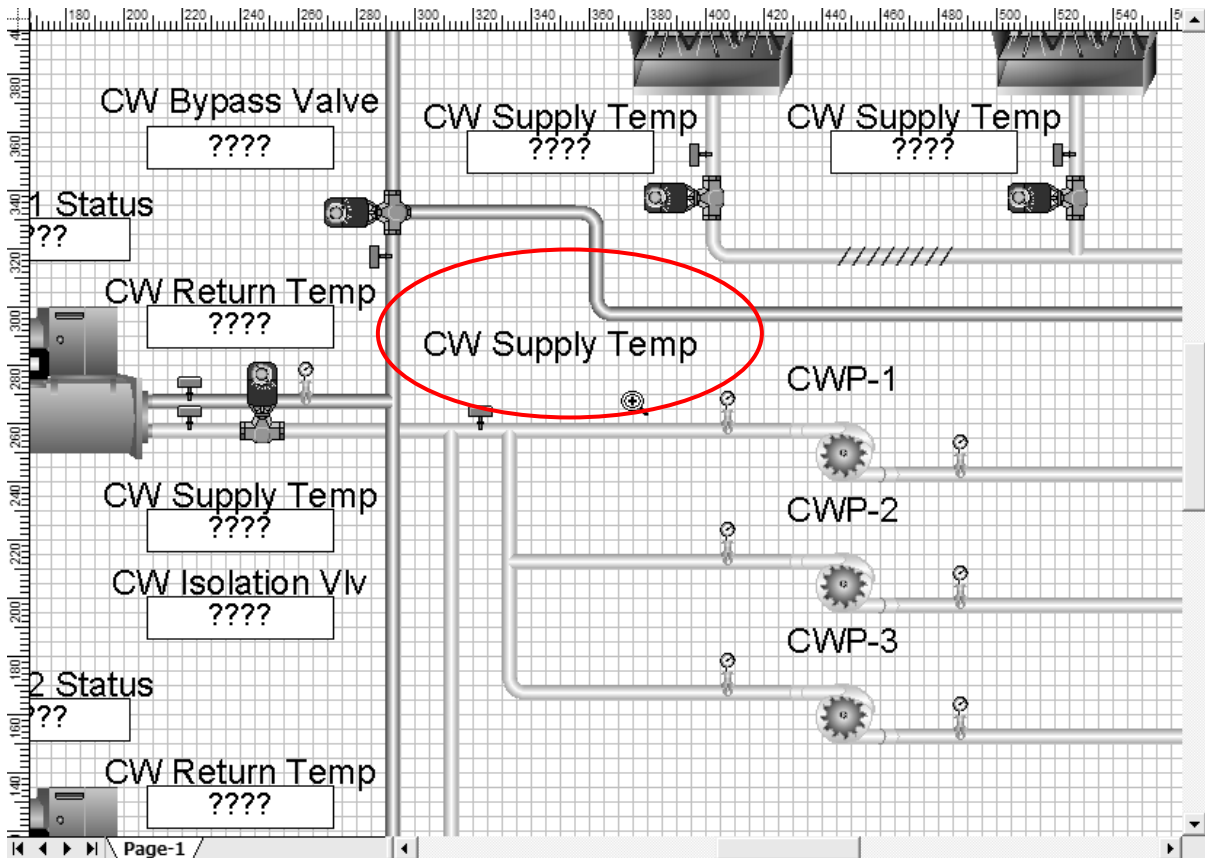
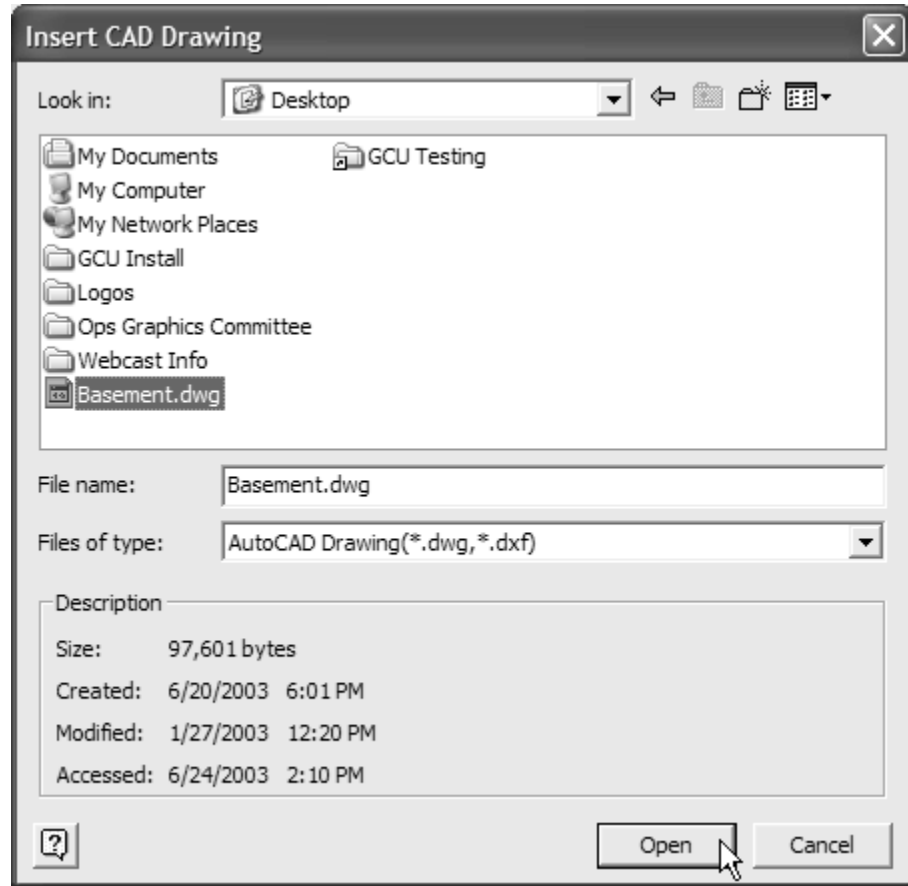


Figure 11: Visio 2002 Drawing with Individual Value Box Hidden

## Importing an AutoCAD File for Use as a Floor Plan Graphic

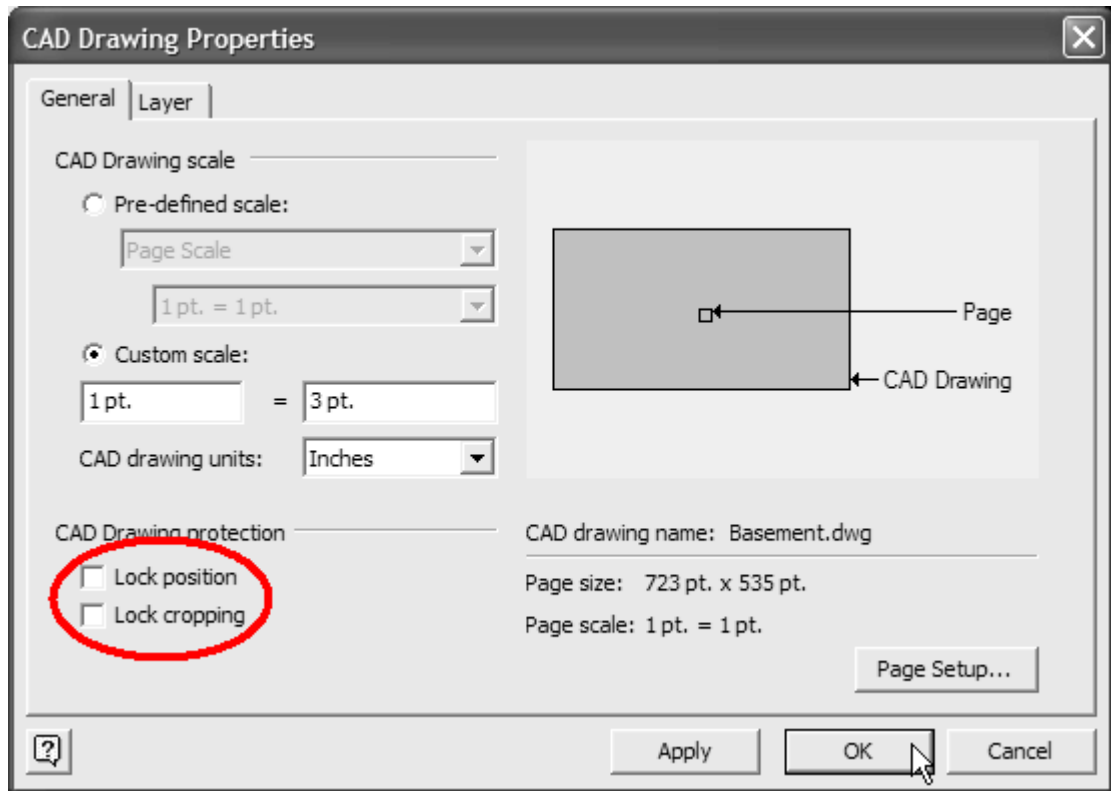
To import an AutoCAD file for use as a floor plan graphic:

1. On the Start menu, select Program Files > Johnson Controls > GSL > GSL Base Template. The GSL Base Template opens in Visio 2002.
2. On the Visio 2002 Insert menu, select CAD Drawing. The Insert CAD Drawing screen appears (Figure 12).



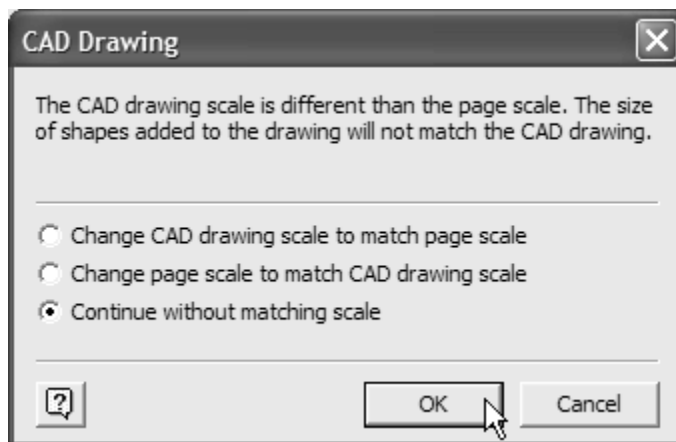
**Figure 12: Insert CAD Drawing Screen**

3. Browse to and select the AutoCAD file (.dwg or .dxf extension) with which you want to work.
4. Click Open. The CAD Drawing Properties screen appears (Figure 13).



**Figure 13: CAD Drawing Properties Screen**

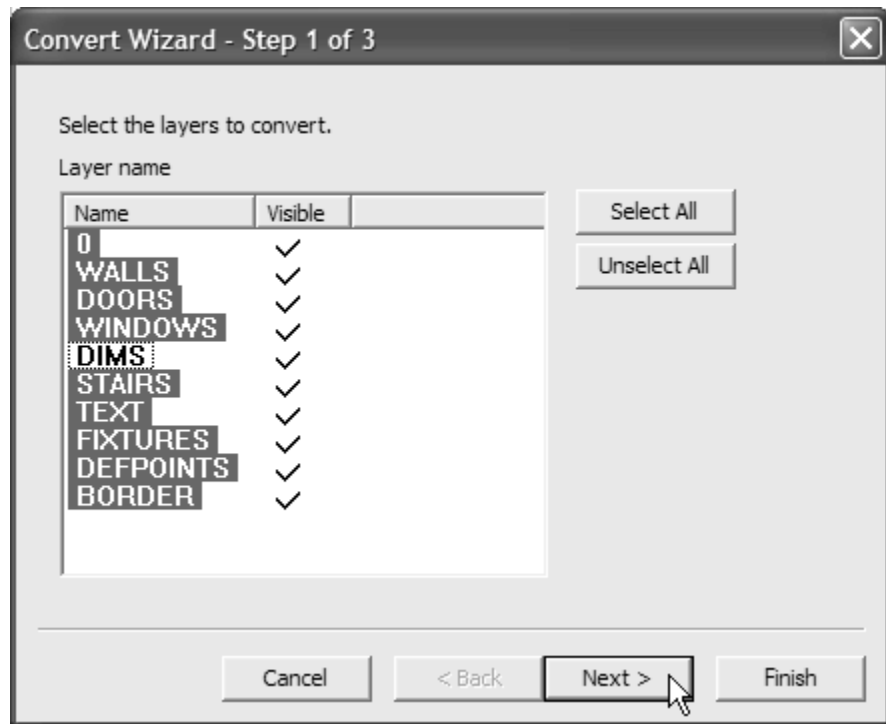
5. Uncheck Lock position and Lock cropping in the CAD Drawing protection area of the CAD Drawing Properties screen. All other settings can remain at their default value.
6. Click OK to continue. The CAD Drawing scale screen appears if the CAD drawing scale is different from the page scale (Figure 14).



**Figure 14: CAD Drawing Scale Screen**

7. Select the Continue without matching scale radio button and click OK. The AutoCAD drawing appears in Visio 2002.

- Right-click on the imported AutoCAD drawing. On the menu that appears select CAD Drawing > Object > Convert. The Convert Wizard appears at Step 1 of 3 (Figure 15).



**Figure 15: Convert Wizard - Step 1 of 3**

- Select the layers of the CAD drawing that you want to convert and click Next. The Convert Wizard - Step 2 of 3 screen appears (Figure 16).

**Note:** Step 2 of the Convert Wizard shows you the layers of the CAD drawing file that are to be converted. After conversion you have the option of deleting or hiding these layers by selecting one of the three radio buttons on the right side of the screen.



**Figure 16: Convert Wizard - Step 2 of 3**

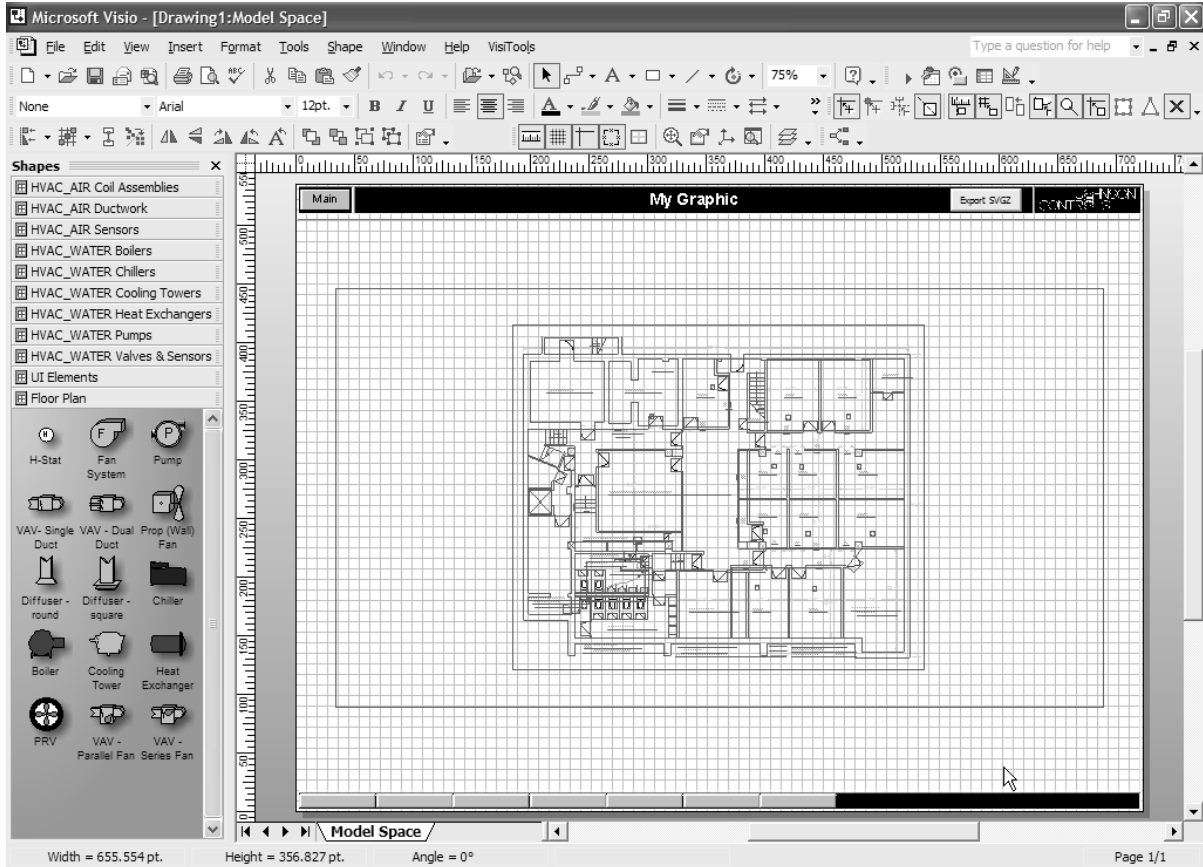
10. After reviewing the layers to be converted and selecting the appropriate radio button, click Next. The Convert Wizard - Step 3 of 3 screen appears (Figure 17).



**Figure 17: Convert Wizard - Step 3 of 3**

11. Keep the default selections as shown in Figure 17 and click Finish. The imported drawing appears in Visio 2002 (Figure 18).

**Note:** You are now ready to modify the drawing for use in the Metasys system extended architecture.



**Figure 18: Imported AutoCAD Drawing in Visio 2002**

12. Continue with the instructions in the Modifying an Imported AutoCAD File for Use as a Floor Plan Graphic section of this document.

## Modifying an Imported AutoCAD File for Use as a Floor Plan Graphic

Use this procedure on AutoCAD drawings imported using the procedure described in the *Importing an AutoCAD File for Use as a Floor Plan Graphic* section of this document.

**Note:** For some AutoCAD files, typically larger sized files, following these instructions (along with the instructions that follow) do not produce the desired results. For these AutoCAD files, follow the additional instructions in the *Creating a Floor Plan Graphic from an AutoCAD File - Alternate Method* section of this document.

To modify an imported AutoCAD drawing for use as a floor plan graphic:

1. On an imported AutoCAD drawing (Figure 18), click and drag the cursor to select all of the shapes converted by the import procedure described in the *Importing an AutoCAD File for Use as a Floor Plan Graphic* section in this document.
2. Click the down arrow to the right of the line color tool and select a line color for your floor plan from the drop-down palette that appears.

**Note:** Gray-25% works well for floor plans.

3. Click the down arrow to the right of the Text Color tool. Select a color for your floor plan's text from the drop-down palette that appears.

**Note:** Black works well for text.

4. On the Visio 2002 Shape menu, select Grouping > Group to group the converted objects.
5. Resize the newly grouped objects as necessary by pressing the Ctrl key while dragging a corner of the drawing. Press the Ctrl key while resizing to ensure that the drawing is resized proportionately.
6. On the Visio 2002 Tools menu, select Snap & Glue. The Snap & Glue properties screen appears (Figure 19).

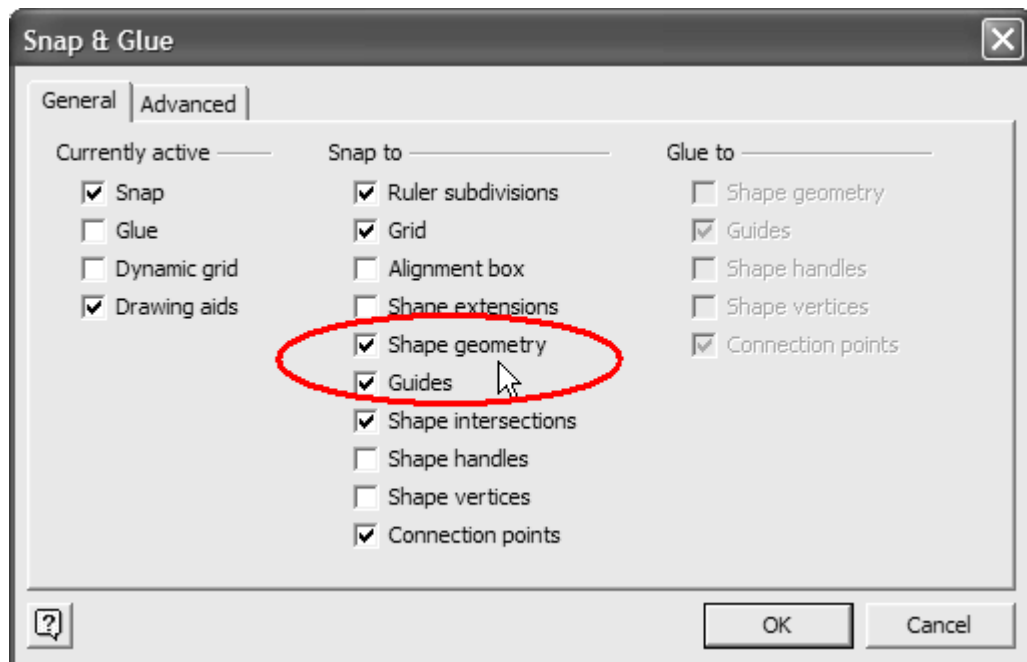
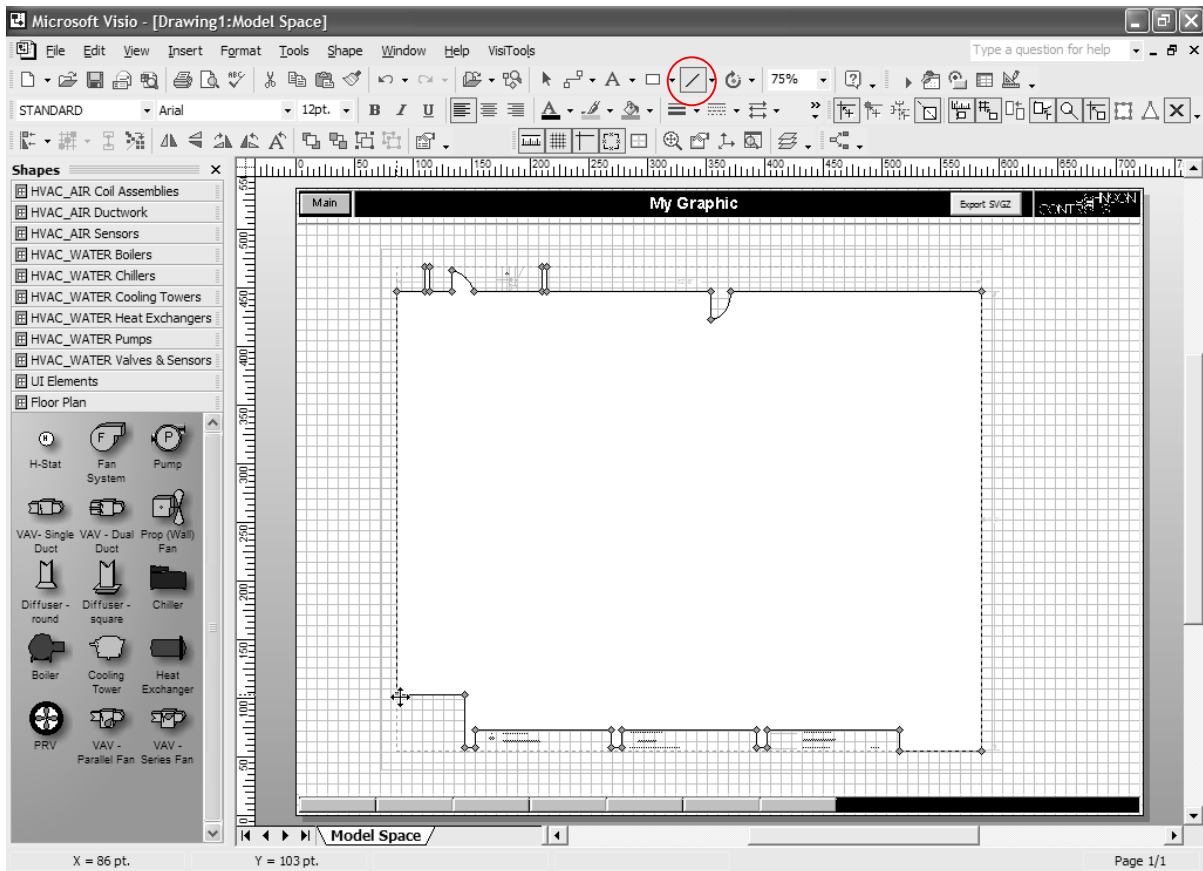


Figure 19: Snap & Glue Properties Screen

7. Make sure that Shape geometry (circled in Figure 19) is checked and click OK. This property helps to outline and provide a fill color for the floor plan.
8. Select the Line Tool on the Visio 2002 tool bar.
9. With the Line Tool selected, click a spot on the perimeter of the floor plan and trace the floor plan until you reconnect with your starting point. If you have a default color set for Fill Color, the shape takes on that color. Figure 20 shows a floor plan perimeter that has been traced and filled (fill color white) in this manner.

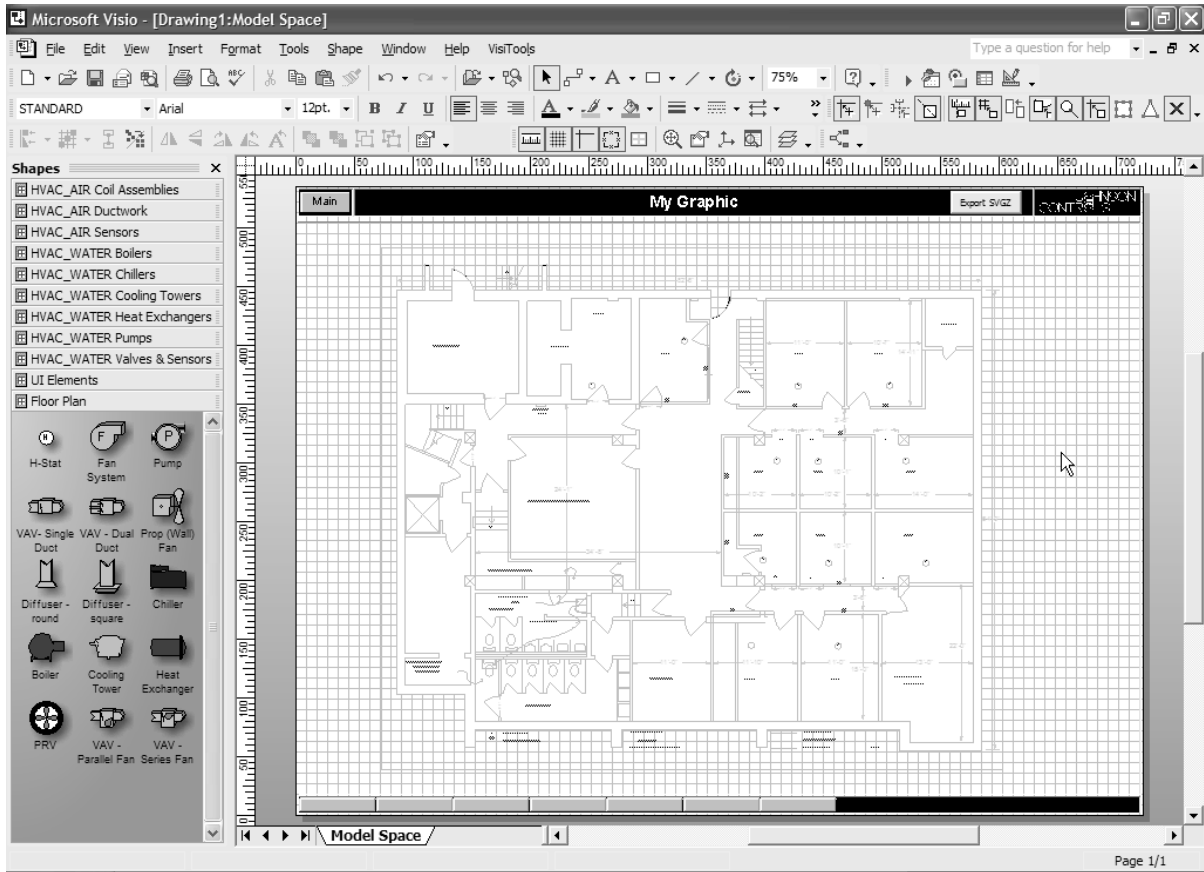
**Note:** Pressing the Shift key while dragging out your line creates a straight line. You can change from the Line Tool to the Arc Tool as necessary to complete your shape by clicking the down arrow next to the Line Tool icon (circled in Figure 20).



**Figure 20: Floor Plan Perimeter Traced and Filled**

10. On the Visio 2002 Shape menu, select Order > Send to Back to send your shape to the back of the Visio 2002 drawing. The shape now appears behind the floor plan (Figure 21), which makes the floor plan stand out from the template background.





**Figure 21: Floor Plan Perimeter Traced and Filled behind Floor Plan**

11. Clean up the floor plan as needed and click the Export SVGZ button to create your SVGZ file. Consider removing detail from the floor plan to improve the display time for graphics.
12. Add desired shapes from the stencils provided and follow the instructions in the *Importing SVGZ Files to the User Graphics Tool (UGT)* section in this document. See Figure 22 for an example of a floor plan graphic with shapes added.

**Note:** If the floor plan background image does not appear as expected, follow the procedures in the *Creating a Floor Plan Graphic from an AutoCAD File - Alternate Method* section in this document.

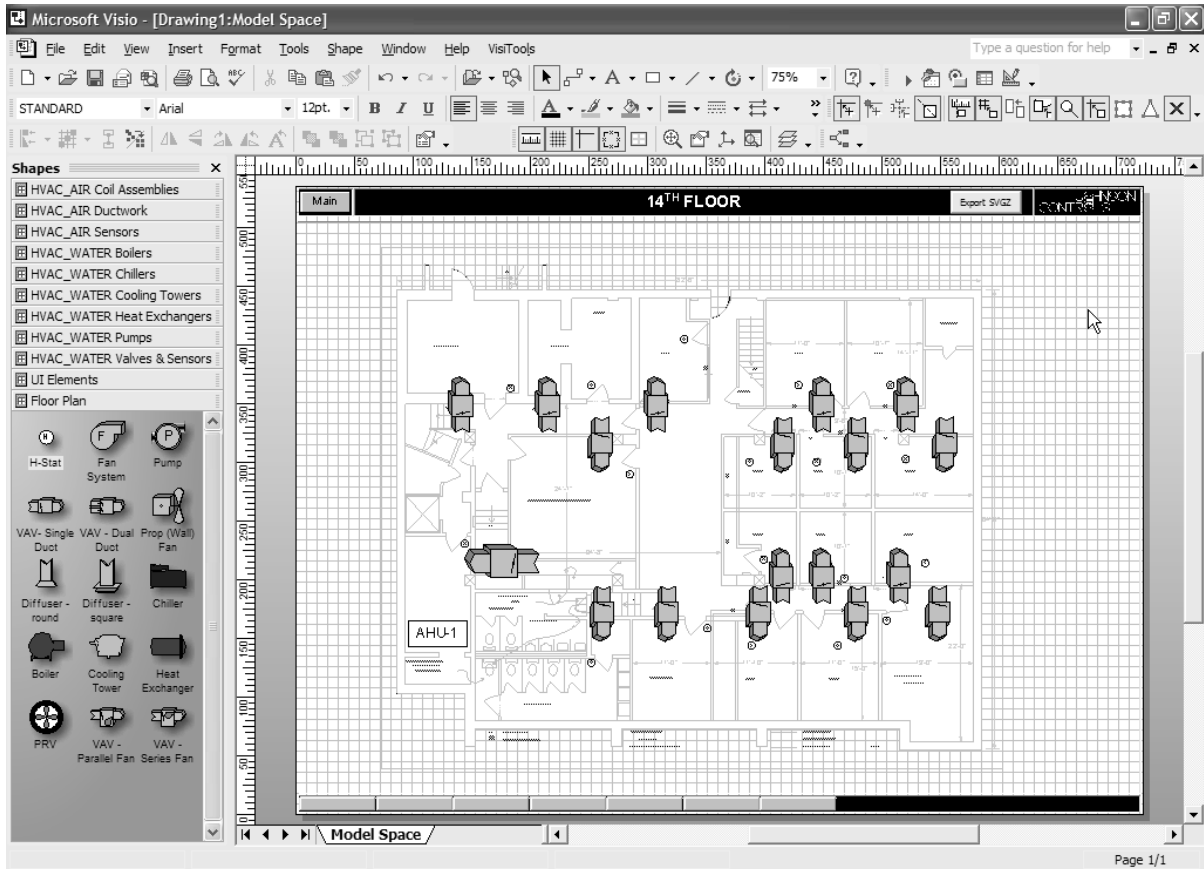


Figure 22: Floor Plan with Shapes Added

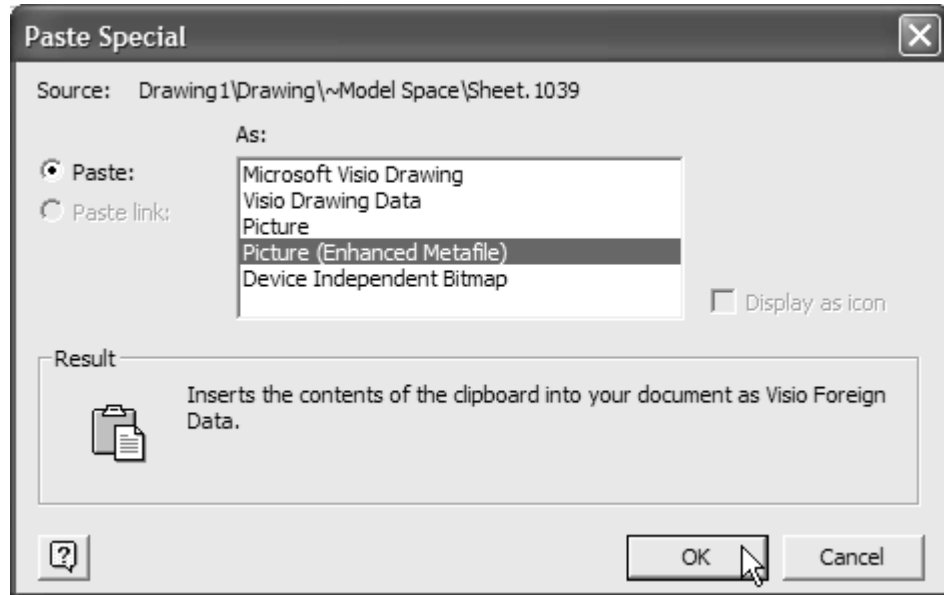
## Creating a Floor Plan Graphic from an AutoCAD File - Alternate Method

**Note:** For some AutoCAD files, typically larger sized files, the instructions in the *Modifying an Imported AutoCAD File for Use as a Floor Plan Graphic* section of this document do not produce the desired results. For these AutoCAD files, follow the extra instructions in this section.

1. Right-click on the converted, grouped shape (Figure 18) in Visio 2002 and select Cut from the Edit menu.

**Note:** Cutting the shape moves it from your drawing to the Windows operating system Clipboard. Do not copy or cut anything else before you paste this drawing or you may lose data. If you accidentally cut or copy something else to the Clipboard, try the Undo command on the Edit menu.

2. On the Edit menu, select Paste Special. The Paste Special screen appears (Figure 23).



**Figure 23: Paste Special Screen**

3. Select Picture (Enhanced Metafile) from the As: list box and click OK.
4. With the shape still selected, open the Shape menu and select Grouping > Ungroup.

**Note:** This action causes Visio 2002 to convert the enhanced metafile in to Visio shapes.

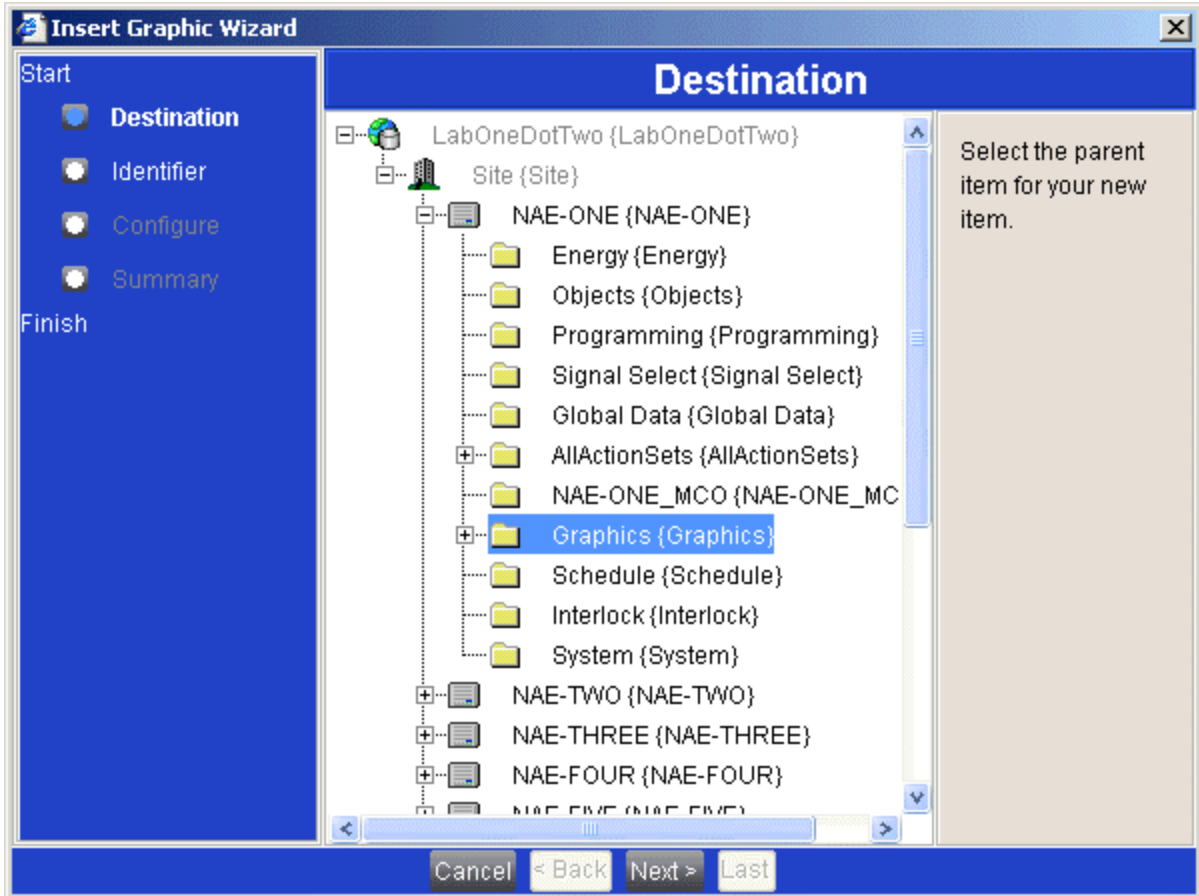
5. On the Edit menu, click Select All.
6. On the Shape menu, select Grouping > Group to group the converted shapes.
7. Add desired shapes from the stencils provided and follow the instructions in the *Importing SVGZ Files to the User Graphics Tool (UGT)* section in this document. See Figure 22 for an example of a floor plan graphic with shapes added.

## Importing SVGZ Files to the User Graphics Tool (UGT)

To import SVGZ files to the User Graphics Tool (UGT):

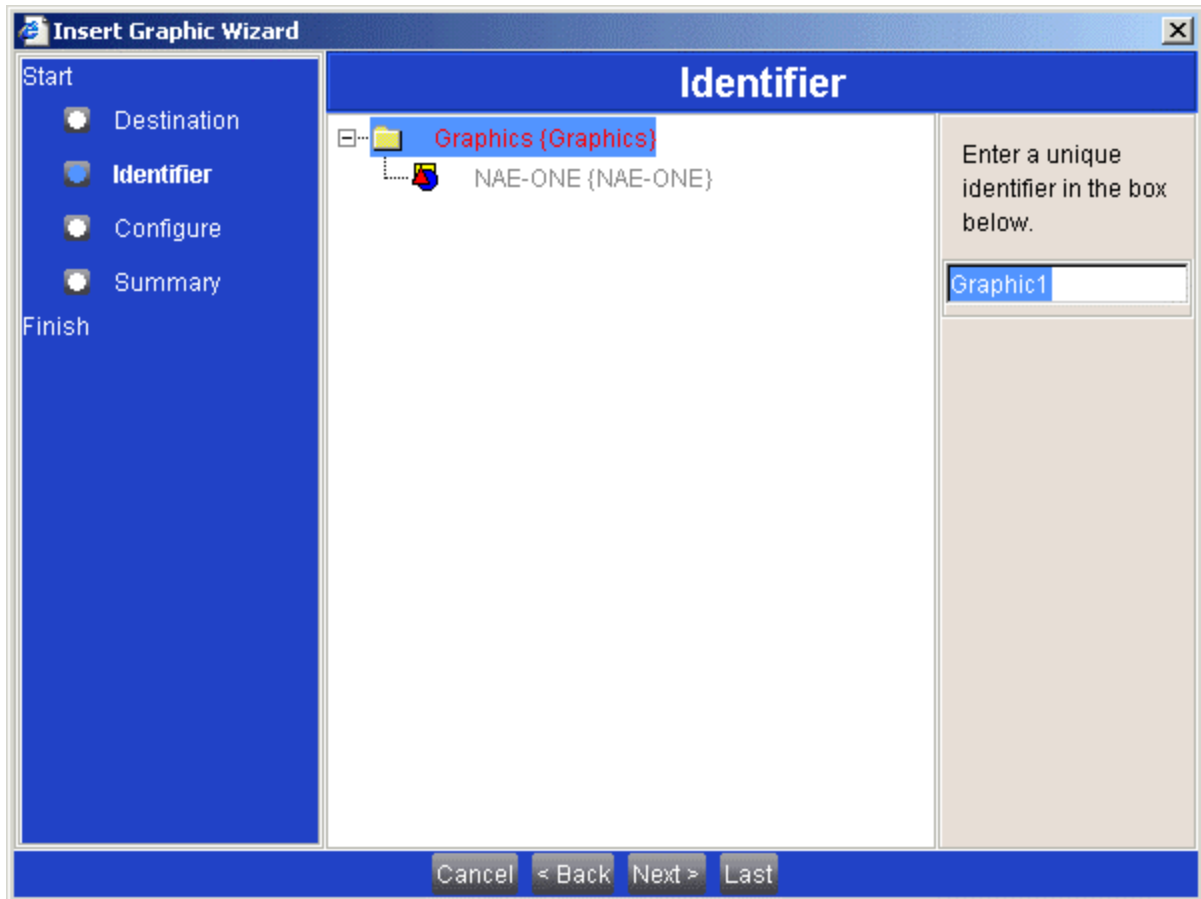
**Note:** For information on using the System Configuration Tool (SCT) and the UGT, see the Metasys system online *Help*.

1. Log on to the SCT.
2. Open the archive to which you want to add SVGZ graphics.
3. Select the location in the Navigation Tree where you want to store your graphic.
4. On the Insert menu, select Graphic. The Insert Graphic Wizard opens to the Destination screen (Figure 24).



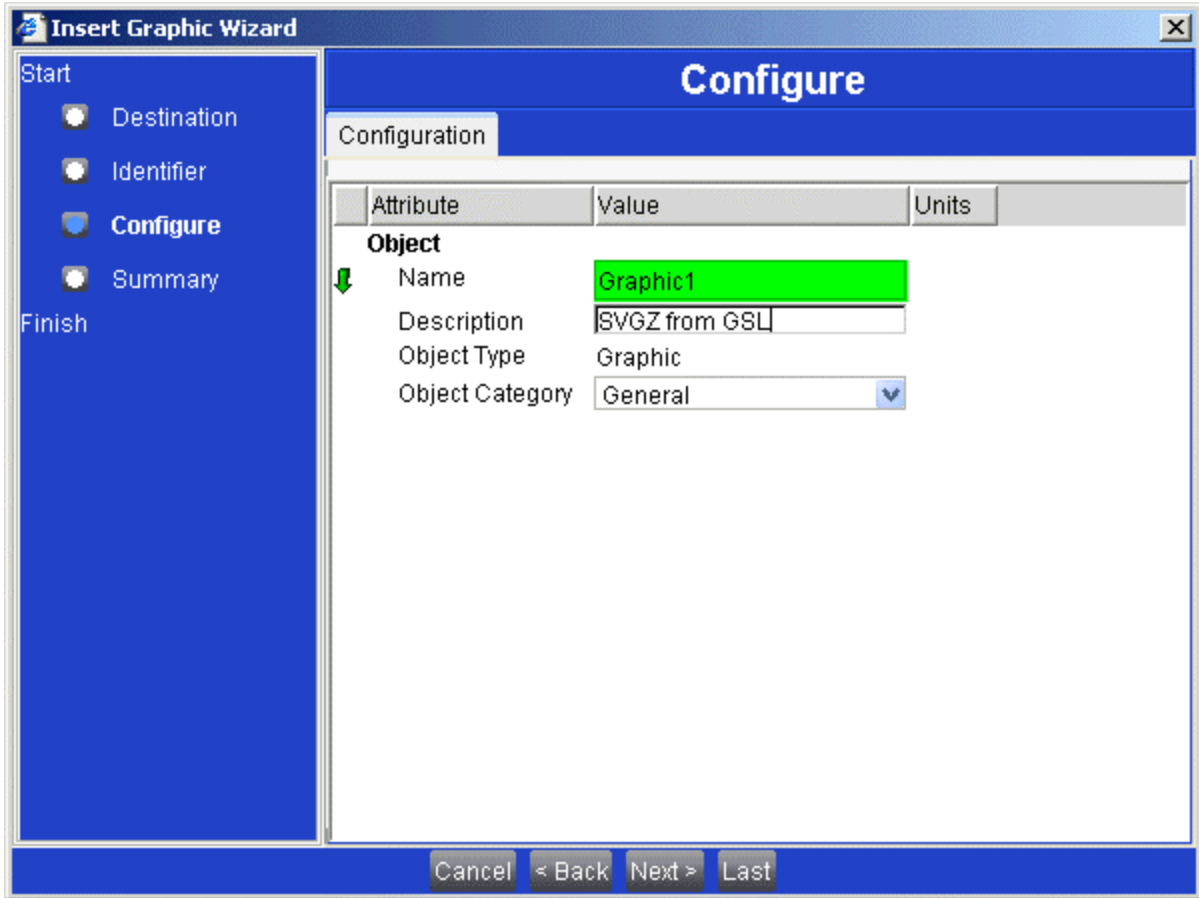
**Figure 24: Insert Graphic Wizard Destination Screen**

5. If you have selected the location for your graphic, it appears as the default destination. If not, or if you have decided to place the graphic in a different location, select the destination for your new graphic and click Next. The Insert Graphic Wizard's Identifier screen appears (Figure 25).



**Figure 25: Insert Graphic Wizard Identifier Screen**

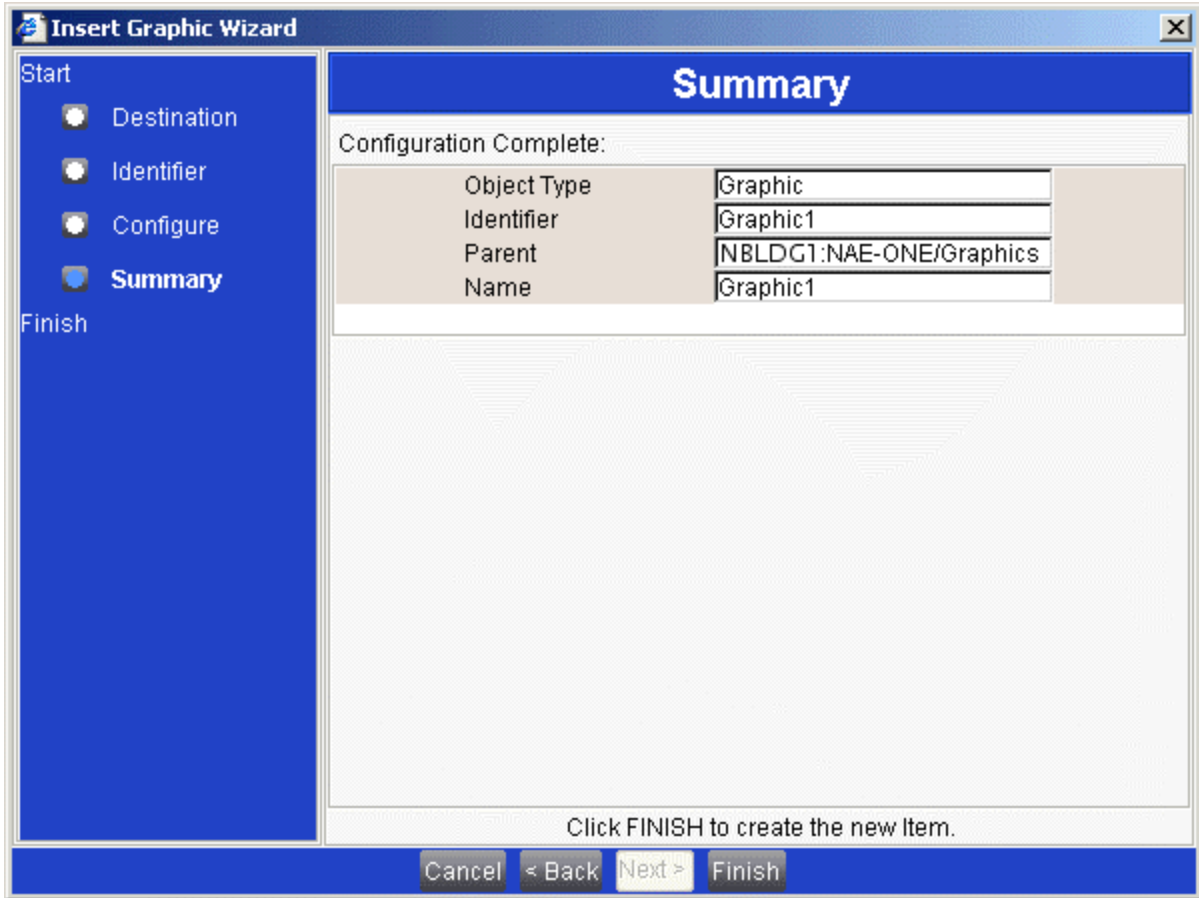
6. Give the graphic a unique name and click Next. The Insert Graphic Wizard Configure screen appears (Figure 26).



**Figure 26: Insert Graphic Wizard Configure Screen**

7. Make sure the information on the Configure screen is correct and click Next. The Summary screen appears.

**Note:** The Description and Object Category information is optional but can be used to help you remember the purposes for different graphics.

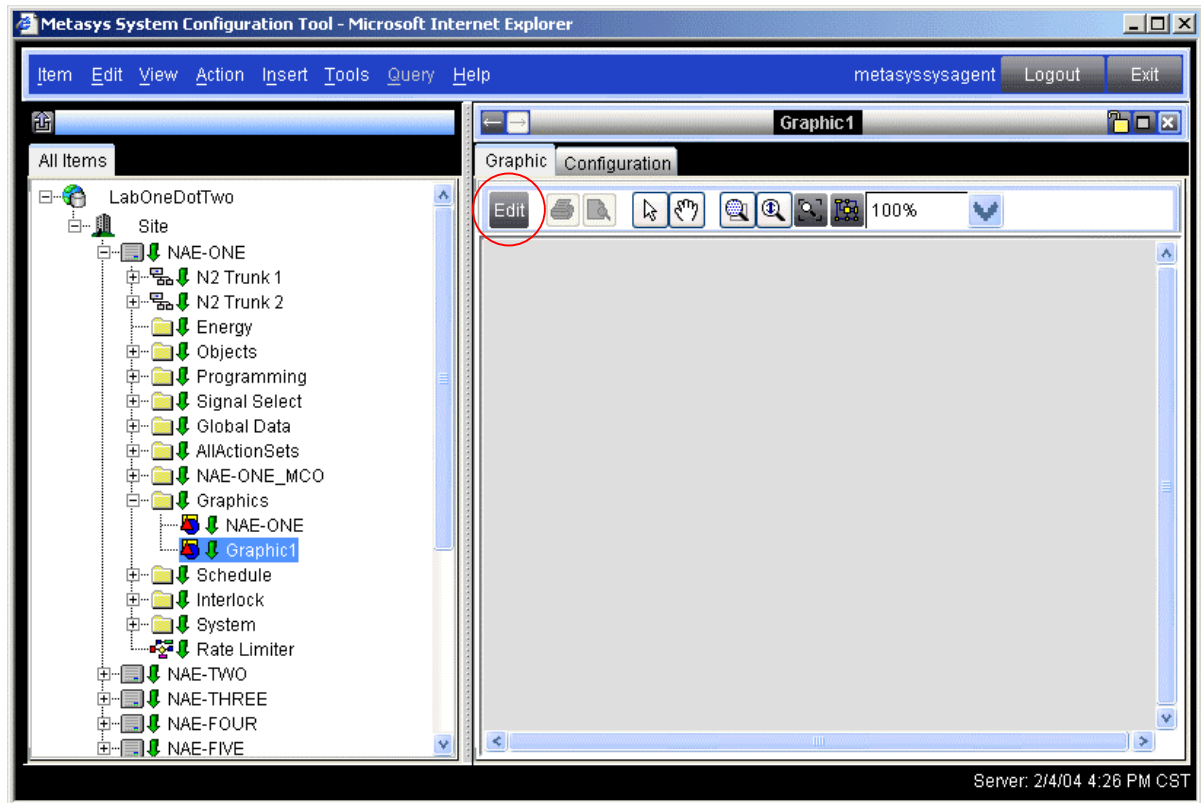


**Figure 27: Insert Graphic Wizard Summary Screen**

8. If the information on the Summary screen is correct, click Finish. You are returned to the SCT user interface.

**Note:** For verification, the Summary screen describes the information you entered in the previous steps of the wizard.

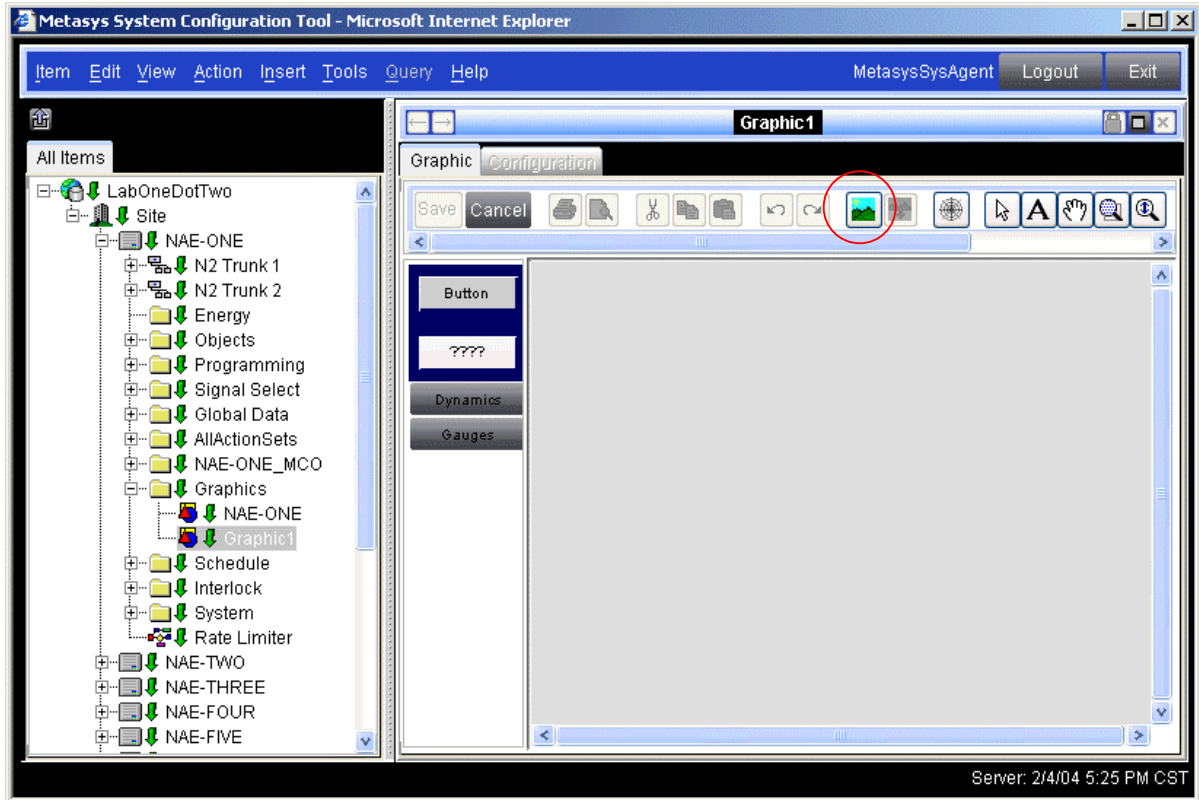
9. On the Action menu, select Refresh all tabs to ensure that you can see your new graphic in the left panel of the Navigation Tree.
10. Navigate to the newly inserted graphic and either double-click it or drag it to the right panel. The new, blank graphic appears in the right panel (Figure 28).



**Figure 28: New Blank Graphic in SCT**

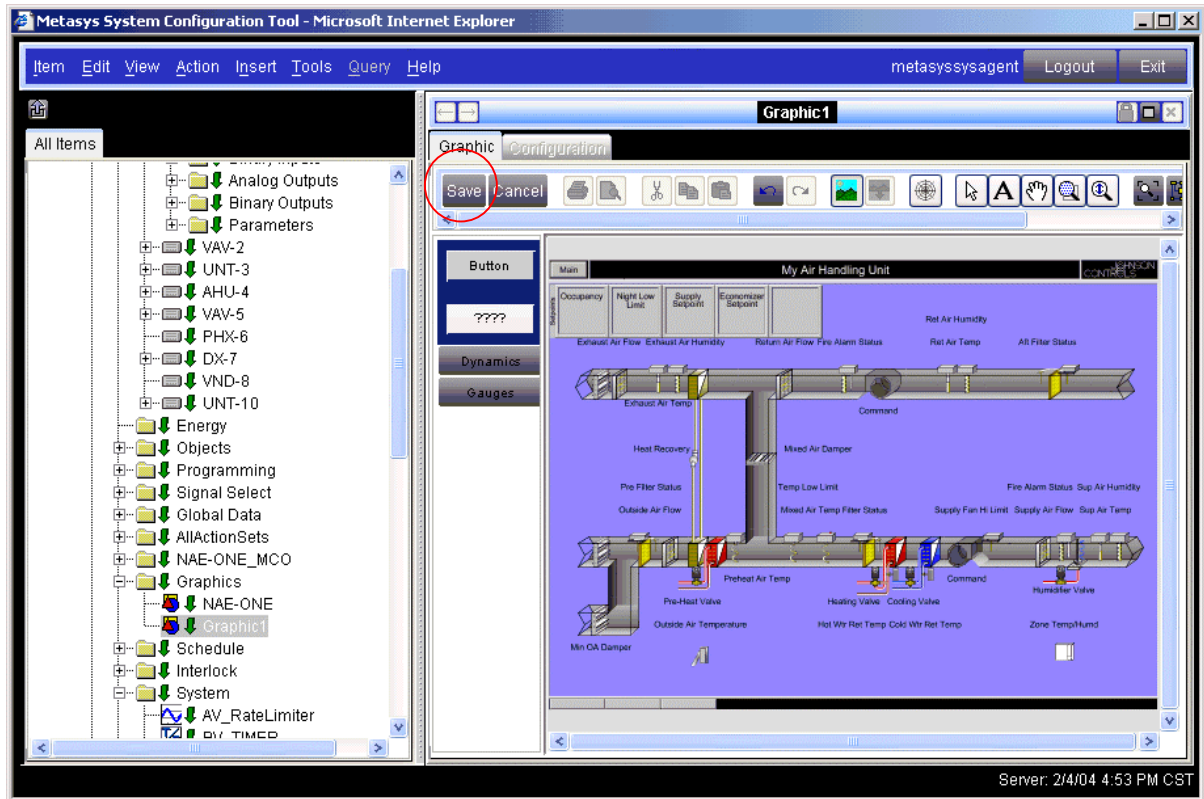
11. Click the Edit button in the right panel. The graphic opens to Edit mode (Figure 29).





**Figure 29: New Blank Graphic in SCT in Edit Mode**

12. Click the Set Background Image icon (circled in Figure 29) in the right panel.
13. Select SVGZ under File Type, navigate to the location of your SVGZ graphic, and select the SVGZ file you wish to set as a Metasys system extended architecture background image. The SVGZ graphic appears as a static background in your Metasys system extended architecture graphic (Figure 30).



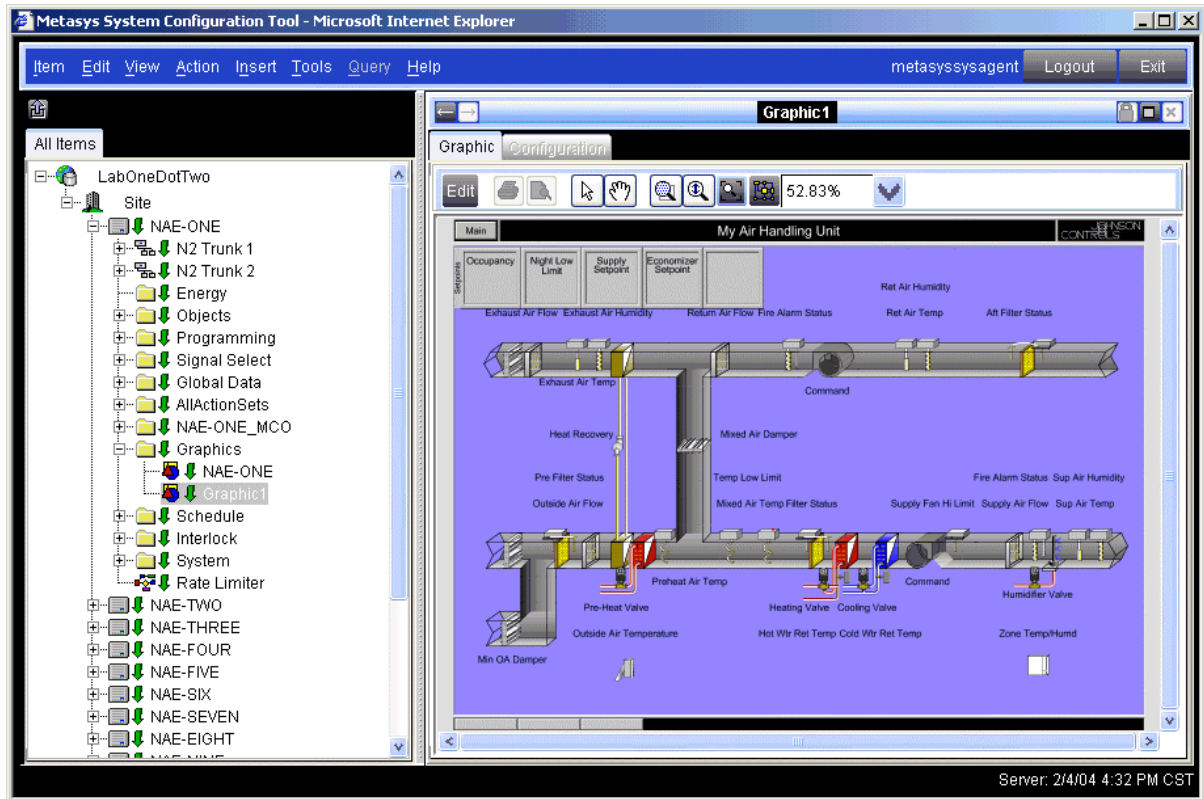
**Figure 30: SVG Background Added to a UGT Graphic**

14. Click Save in the right panel. Depending on the size of your graphic, you may need to scroll to the right or left to make the Save button visible on the Graphics toolbar.
15. Continue to the *Binding Data to a Metasys System Extended Architecture Graphic Using the UGT* section in this document.

## Binding Data to a Metasys System Extended Architecture Graphic Using the UGT

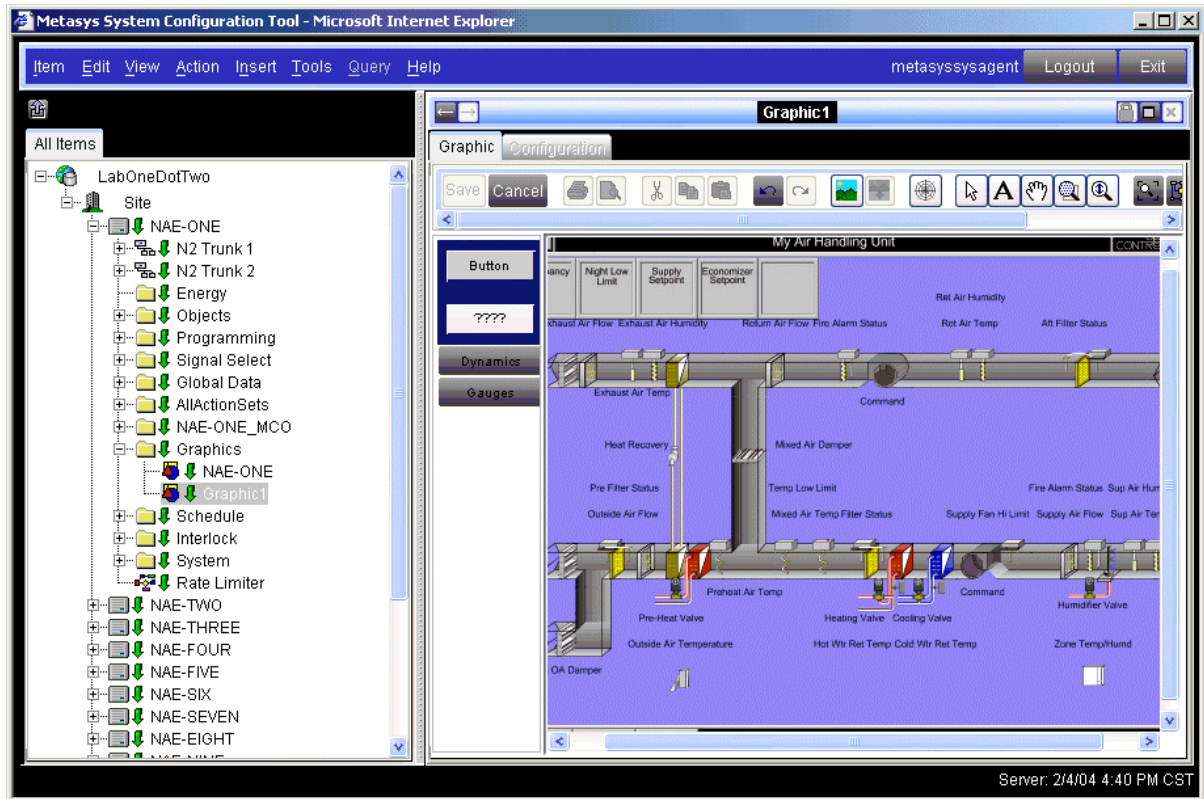
To bind data to a Metasys system extended architecture graphic using the UGT:

1. Navigate to the graphic to which you want to bind data and either double-click it or drag it to the right panel. The graphic appears in the right panel (Figure 31).



**Figure 31: Open Graphic in UGT**

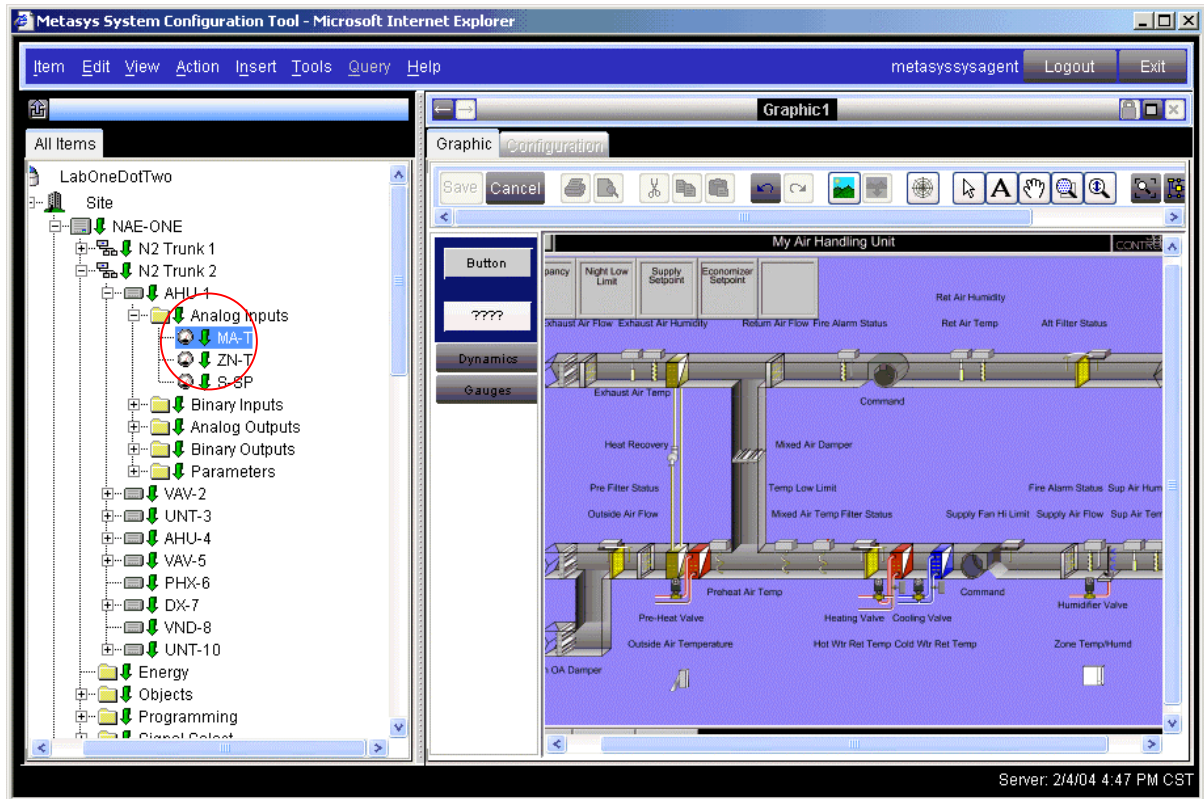
2. Click the Edit button at the top of the panel. The UGT goes into Edit mode (Figure 32).



**Figure 32: UGT Graphic in Edit Mode**

3. In the left panel, navigate to and select the objects you want to bind to the graphic symbol. In Figure 33 a Mixed Air Temperature object is selected (MA-T).

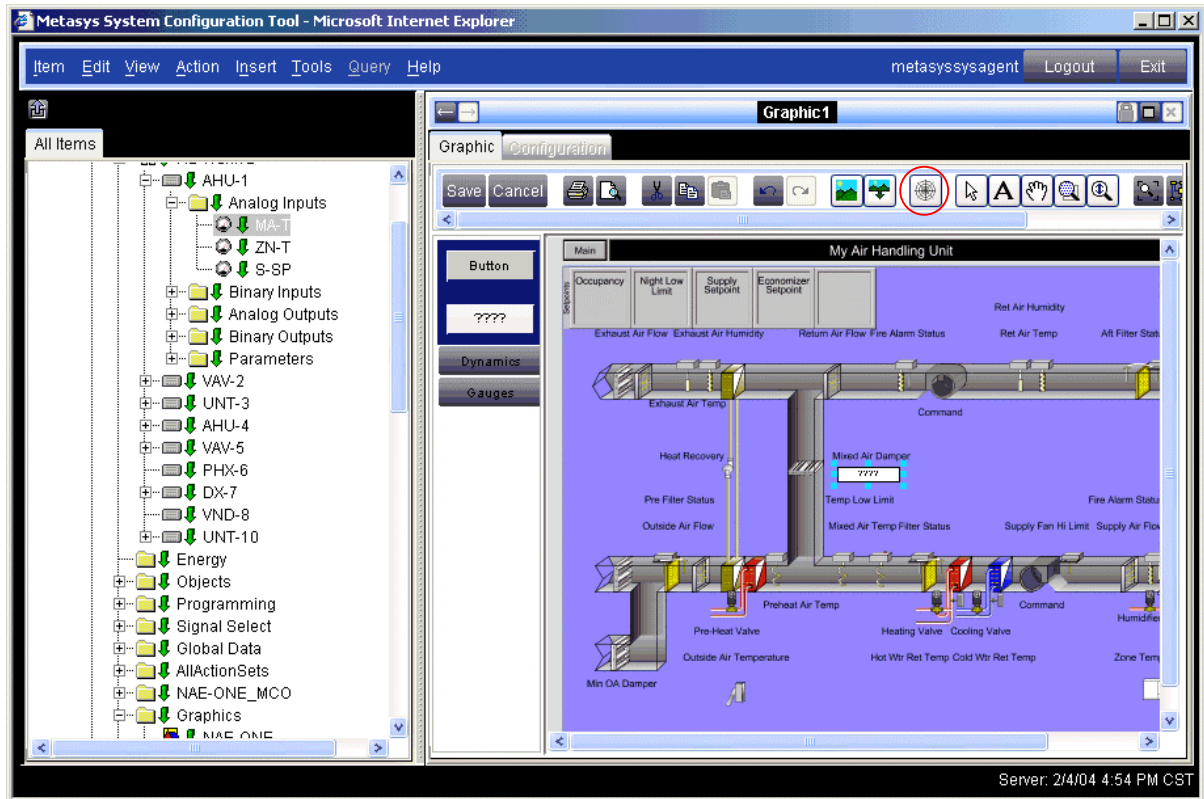
**Note:** You can select multiple objects from the Navigation Tree at once by using the Shift key to select a range of objects or the Ctrl key to select individual objects. If you select multiple objects, dragging the graphic symbol into the Metasys system extended architecture graphic creates an array of symbols that are already bound to the objects selected.



**Figure 33: Mixed Air Temperature Object Selected**

- Click the symbol (for example, a button, a value box, a dynamic symbol, or a gauge symbol) on the left side of the right panel and drag it to the part of the graphic on which you want the object placed. If you have already selected an object, it is automatically bound to the graphic symbol. If you want a graphic symbol that is not automatically bound, make sure to deselect all objects in the Navigation Tree.

**Note:** If the labels in the background graphic were not given actual names when created in Visio 2002, that is, the labels say **Label1**, **Label2**, etc... you can cover them using the text tool.



**Figure 34: Mixed Air Temperature Value Box Placed by Mixed Air Damper**

- To edit a value box in a graphic, select the Bind cursor (circled in Figure 34) and select the Metasys system extended architecture graphic symbol on the drawing that you want to edit. Alternatively, you can double-click the Metasys system extended architecture graphic symbol while in the Edit mode of the UGT.

**Note:** The symbols in the background graphic are not selectable.

- Save the Metasys system extended architecture graphic. If you are online, the graphic symbols automatically update. If you are offline, you need to download or sync the database to get the graphic symbols to update.

**Note:** If you have only added one graphic to a database, it is much faster to sync the database than to download the database. See the *Load Wizard* topic in the Metasys system online *Help* for more information.

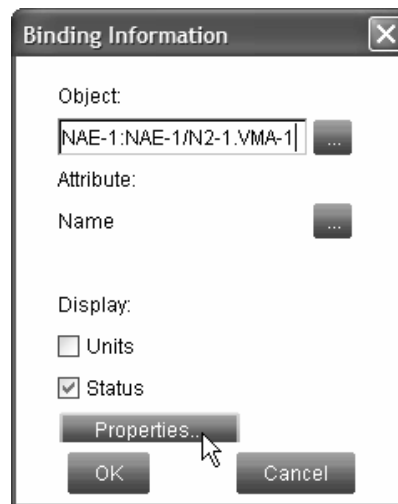
## Editing, Copying, and Pasting a Metasys System Extended Architecture Graphic Value Box Format

You can edit, copy, and paste the format of Metasys system extended architecture graphics value boxes. The following attributes can be copied and pasted using this feature.

- size – length and width of value box
- whether the value box should display Units and/or by Status
- font, font style, and font size

To edit, copy, and paste a Metasys system extended architecture graphic value box format:

1. With your graphic open, double-click on a value box. The Binding Information dialog box appears (Figure 35).



**Figure 35: Binding Information Dialog Box**

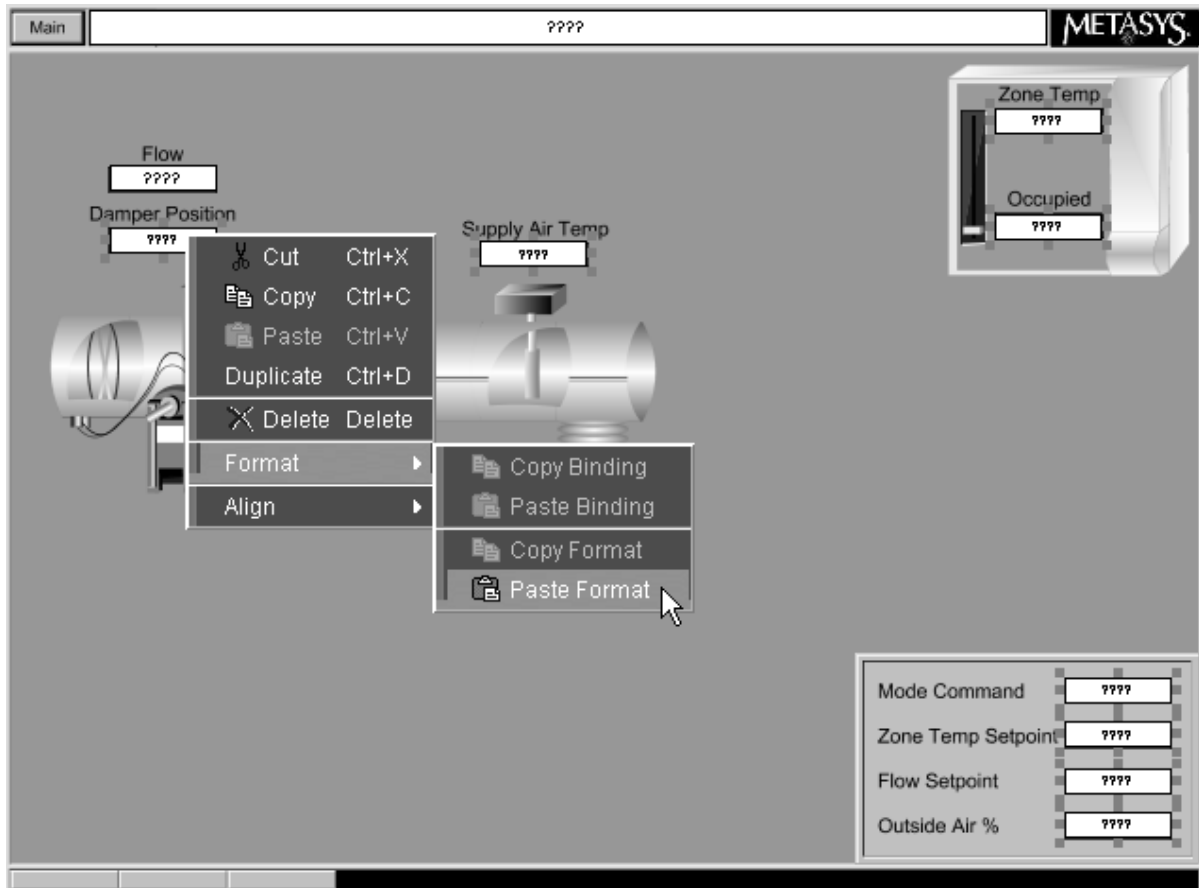
2. Select whether you want the value box to display the bound object's Units and/or Status (through color changes of the value box) by clicking the appropriate check box.
3. Click the Properties button in the Binding information dialog box. The Choose Font screen appears (Figure 36).



**Figure 36: Choose Font Screen**

4. Change the Font properties as necessary and click OK. You are returned to the Binding Information dialog box.
5. Click OK to close the Binding Information dialog box.
6. Right-click on the edited value box and select Format > Copy Format from the menu that appears.
7. Press the Ctrl key and select each of the value boxes to which you wish to paste the format.
8. Right-click on one of the selected value boxes and select Format > Paste Format from the menu that appears. All selected value boxes are updated. Figure 37 and Figure 38 show an example where multiple value boxes were selected and updated.





**Figure 37: Pasting Formats into Selected Value Boxes**

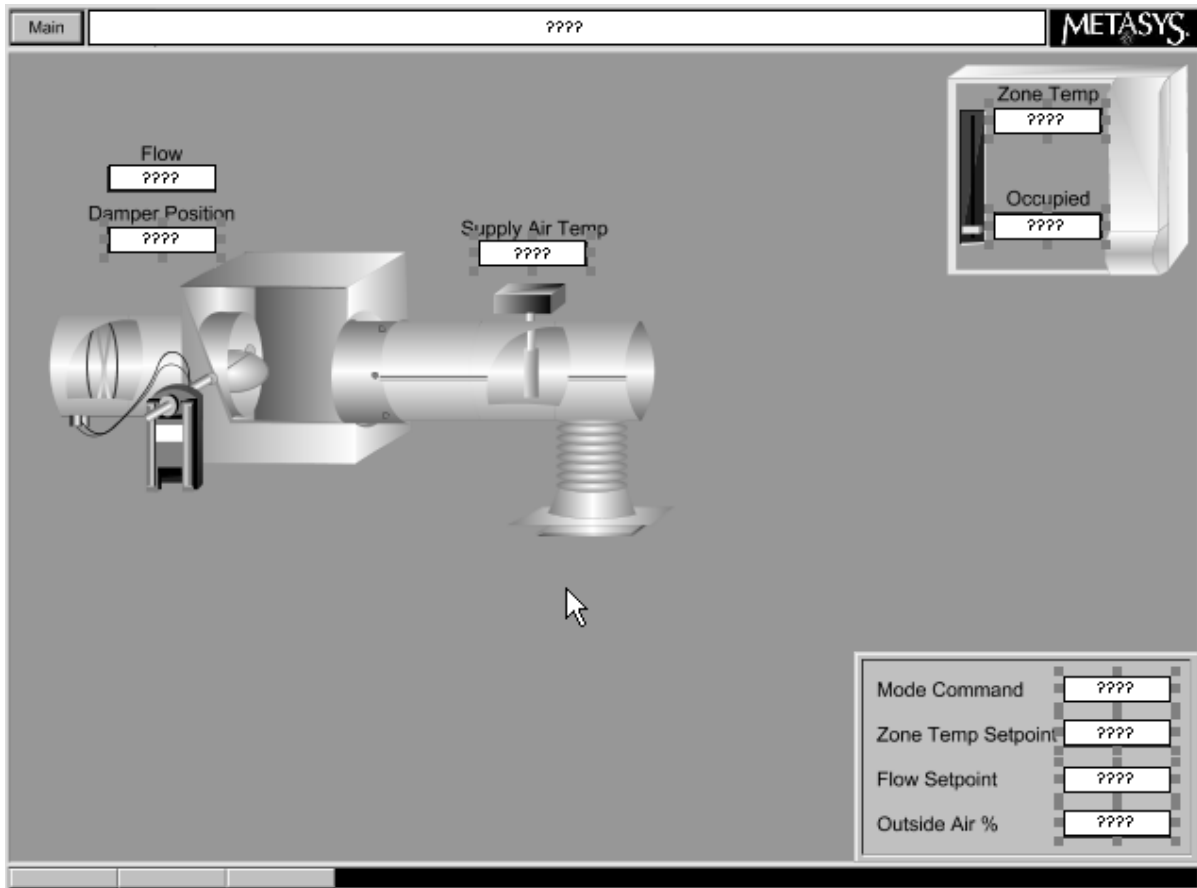


Figure 38: Fonts Updated in Selected Value Boxes

## Implementing Aliasing

There are three steps to implement aliasing.

1. Create a typical graphic whose value boxes are set up to handle an alias. See the *Creating a Typical Graphic to Handle Aliases* section in this document.
2. Bind information to all aliases. See the *Binding Information to Aliases* section in this document.
3. Create buttons in another graphic that link to the typical graphic **and** replace the alias with the desired, fully qualified reference string. See the *Creating Linked Buttons* section in this document.

Aliasing in Metasys system extended architecture supports the following:

- The 'typical' graphic can only contain points in a single field device.
- Only one alias can be used. This is the \* alias. The \* symbol is the character in the binding string that is replaced by the button that causes the navigation to this graphic.

- Editing of a typical graphic is only enabled when that graphic is chosen from the Navigation Tree. Editing is not enabled when the graphic has been loaded from another graphic.

### Creating a Typical Graphic to Handle Aliases

To create a typical graphic to handle aliases:

1. Create an SVGZ file for a background image and import it into the UGT as described in the *Using the GSL in Visio 2002* and the *Importing SVGZ Files to the User Graphics Tool (UGT)* sections of this document.
2. Find a field device that matches your typical graphic configuration. For example, in the points from VMA-1, a VAV box with box heating, is selected (Figure 39).
3. In the Navigation Tree in the left panel, select all the points from the system (in this case, VMA-1).
4. With the points selected, click and drag a value box within the UGT in the right panel (Figure 39). An array of value boxes are created that are automatically bound to the points selected in the Navigation Tree.

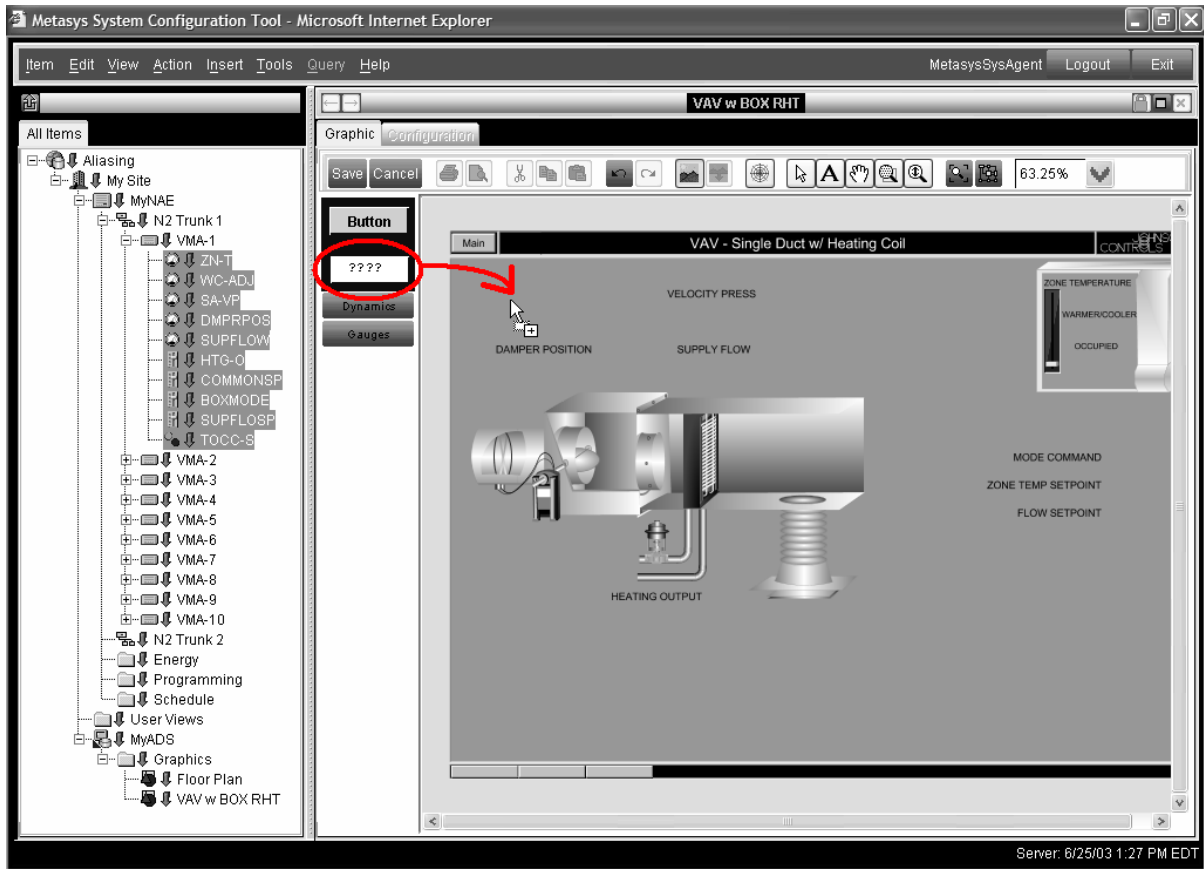
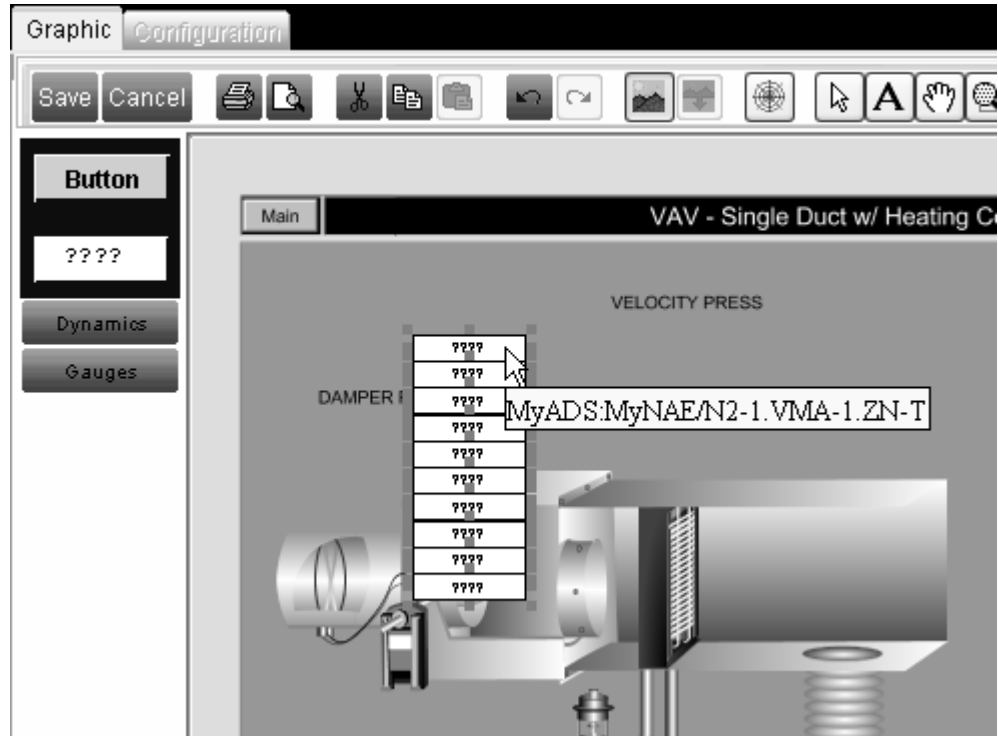


Figure 39: Adding Values to a Graphic in the UGT

5. Hover the cursor over each value box to identify and therefore place the value box appropriately (Figure 38).

**Note:** Value boxes can be aligned automatically by selecting a value box and then choosing an alignment from the right-click menu. The first value box selected becomes the Master and all others selected can be aligned to that value box.



**Figure 40: Cursor over Value Box**

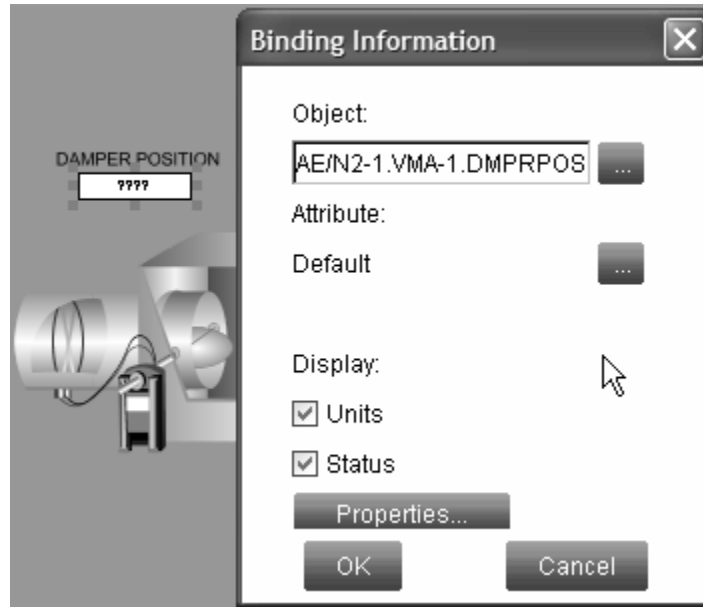
6. Follow the steps in the *Binding Information to Aliases* section in this document for each value box you have created.

### ***Binding Information to Aliases***

To bind information to aliases:

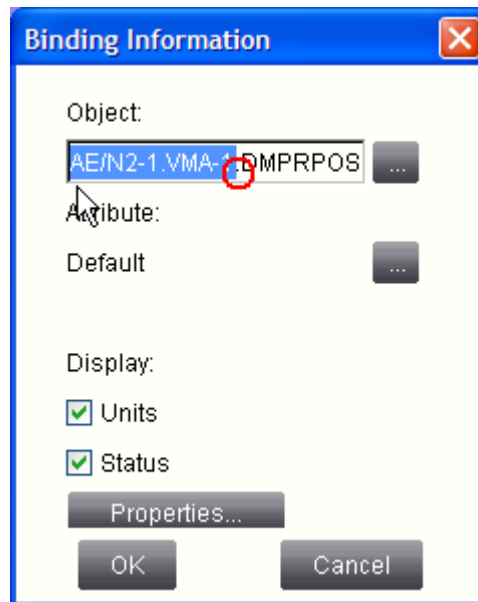
1. Double-click the value box. The Binding Information dialog box appears (Figure 41).

**Note:** If you are changing the attribute to a value other than Default, do so now. Once you change the Object string to an alias, you can no longer edit the attribute.



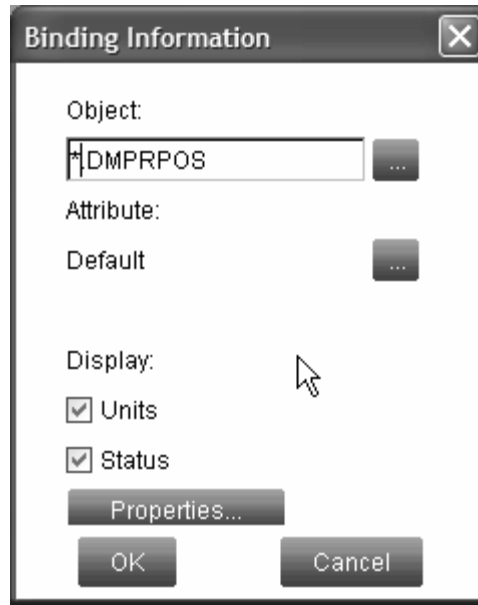
**Figure 41: Binding Information Dialog Box**

2. Highlight the Object string or fully qualified reference to the left of the point just before the point's name. In the example in Figure 42, all characters to the left of .DMPRPOS are highlighted.



**Figure 42: Binding Information Dialog Box with Object Reference Selected**

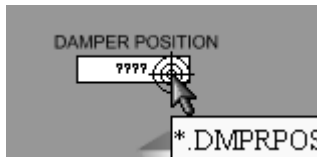
3. With the partial string highlighted in the Object field, enter an asterisk (\*) to replace the reference. Figure 43 shows the object reference replaced with a wild card.



**Figure 43: Binding Information Dialog Box - Object Reference Replaced with Wild Card**

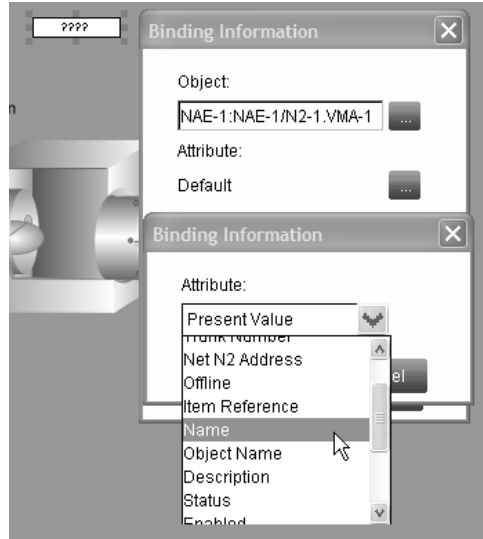
4. Perform Steps 1 through 3 for each value box.
5. Click Save.

**Note:** When you hover your cursor over a value box, the alias string should now appear as in Figure 44.



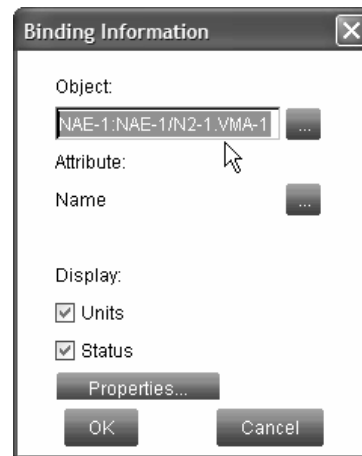
**Figure 44: Verification of Value String in Value Box**

6. To make a title for the typical graphic that changes along with the link, first select a typical controller from the Navigation Tree and drag the Value box graphic symbol into the graphic.
7. Double-click on the Value Box to open the Binding Information dialog box (Figure 45).



**Figure 45: Binding Information Dialog Box**

8. Click the “...” button next to the current attribute to open the attribute dialog box.
9. Change the attribute to Name and click OK.
10. Highlight the entire Object fully qualified reference, replace it with an asterisk (\*), and click OK.



**Figure 46: Binding Information Dialog Box with Object Fully Qualified Reference Selected**

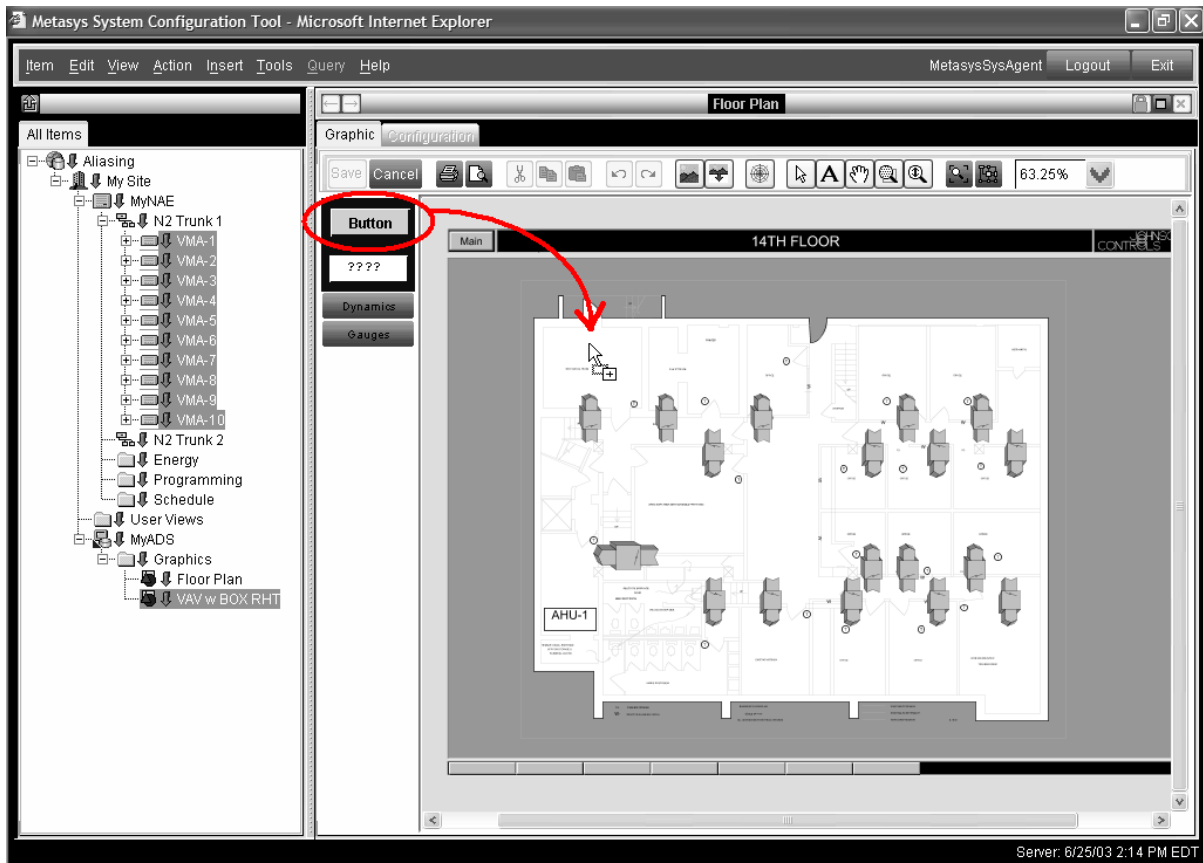
11. Place and size the Value box to fit within the graphic title. Now complete the steps in *Creating Linked Buttons*.

### Creating Linked Buttons

The procedure that follows allows you to create buttons in another graphic that link to the typical graphic (see the *Creating a Typical Graphic to Handle Aliases* section in this document). This procedure also explains how to replace the aliases (see the *Binding Information to Aliases* section) with the desired, fully qualified reference string.

To create linked buttons:

1. In the SCT, either double-click the graphic to which you want to add buttons or click and drag the graphic to the right panel.
2. Click the Edit button to enter the Edit mode of the UGT.
3. In the Navigation Tree in the left panel, press Ctrl + click on all similar field devices and the typical graphic that represents them in the Navigation Tree. See Figure 47.

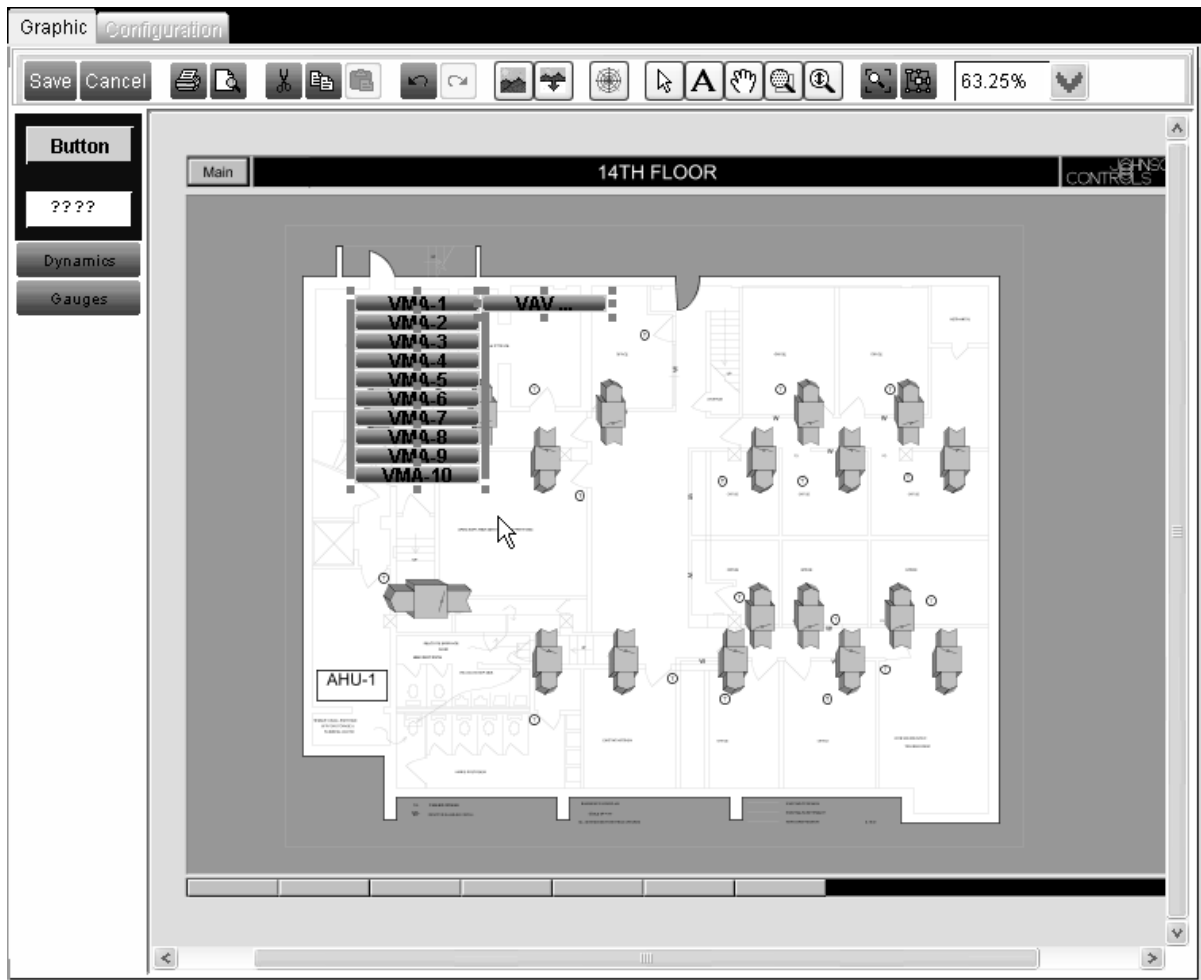


**Figure 47: Selecting Systems to Create Buttons**

4. With the field devices and the typical graphic selected, click and drag the Button symbol in the UGT into the drawing for which you are creating buttons in the right panel. An array of buttons is created, one for each item selected in the Navigation Tree (Figure 48).

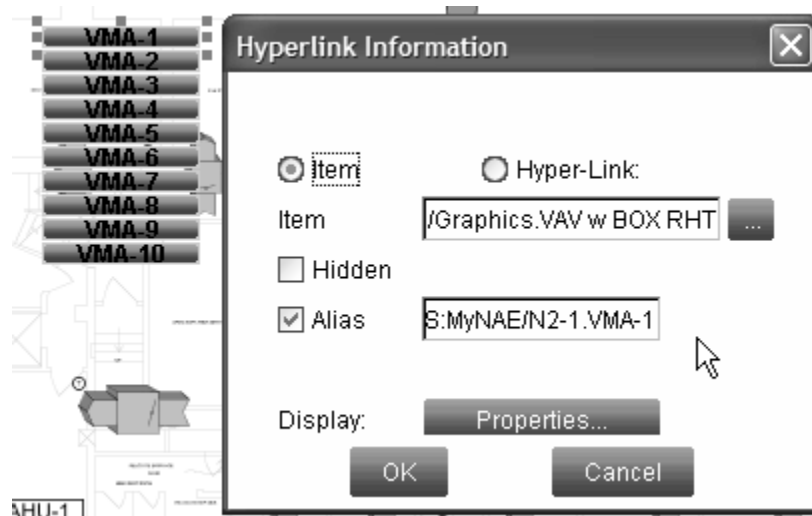


**Note:** The typical graphic does not need a button. Delete the button created for the typical graphic. The button has the label of the typical graphic; in Figure 48 it is the button labeled VAV.



**Figure 48: Graphic with Array of Buttons Created**

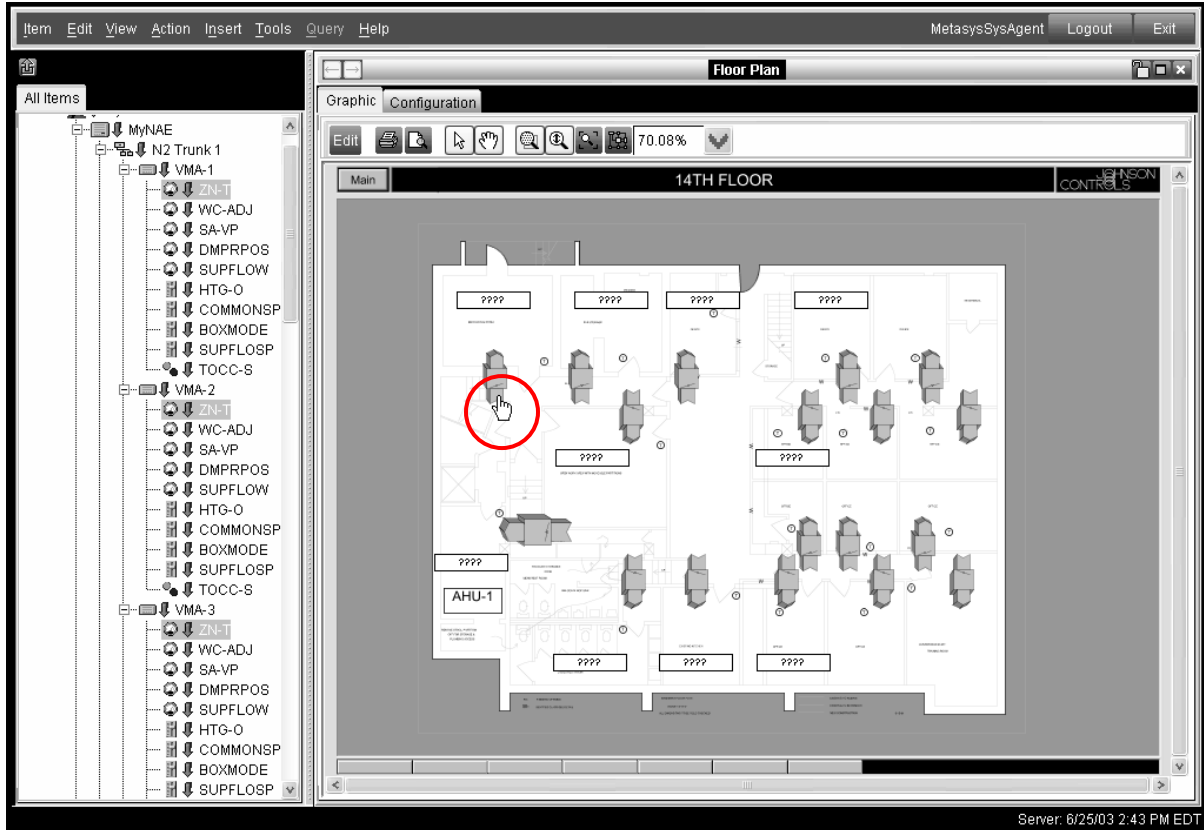
5. Double-click one of the new buttons. The Hyperlink Information dialog box appears (Figure 49).



**Figure 49: Hyperlink Information Dialog Box**

**Note:** The defaults for the Hyperlink Information dialog box (Figure 49) are as follows:

- a. The Item radio button is selected.
  - b. The fully qualified reference for the typical graphic selected in the Navigation Tree is entered in the Item field.
  - c. The Hidden check box is not checked.
  - d. The Alias check box is checked and the Alias field contains the fully qualified reference for the field device that was selected in the Navigation Tree.
6. Adjust the properties of the Hyperlink Information dialog box as needed and click OK. For example, you could check the Hidden check box so that the button could be placed over a VAV box in the background image and still display.
  7. Use the Zoom tools and button handles to resize buttons as necessary. When you drag a button handle, the button fill disappears to enable you to see the graphic beneath it for ease of placement.
  8. Add any value boxes as necessary and click the UGT's Save button.
  9. Move the cursor over a hidden button; the cursor turns into a pointing hand.



**Figure 50: Cursor over Hidden Button**

10. Click on the hidden button to resolve your alias. The typical graphic loads. Now, when you hover the cursor over a value box, the alias is resolved and the tool tip reads the fully qualified reference of the point (Figure 51).

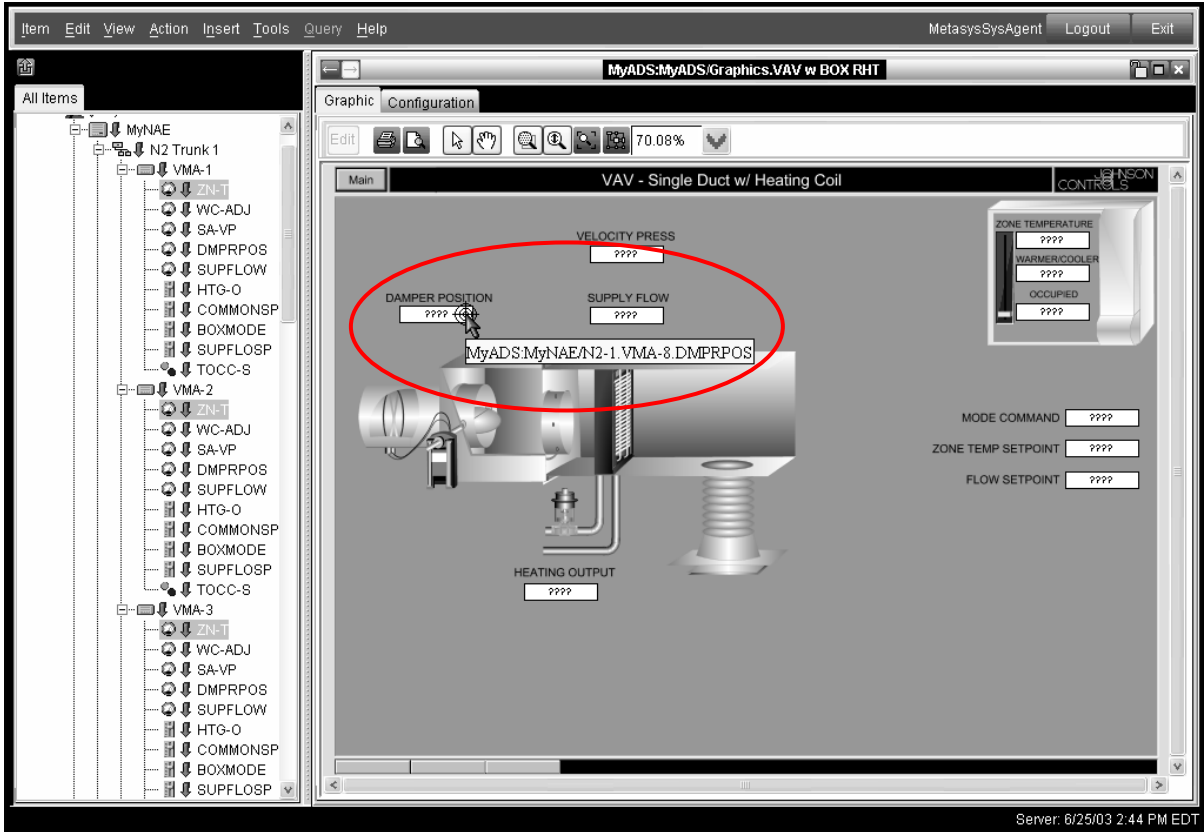


Figure 51: Alias Resolved - Tool Tip Shows the Fully Qualified Reference

# Troubleshooting

## Limitations

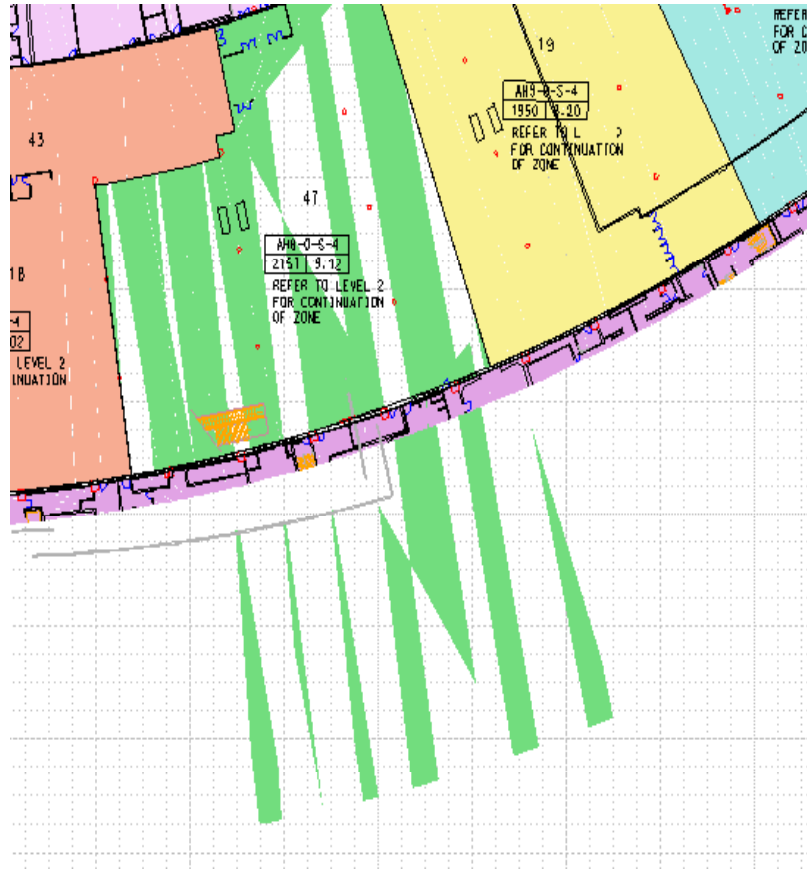
Many drawings need some level of custom drawing beyond what is provided in the GSL. Keep in mind the following limitations of the SVGZ export mechanism:

- The generated SVG is completely static. No features such as animation, layer hiding/unhiding, or pop-up windows are possible.
- No Visual Basic for Applications (VBA) from Visio 2002 software is preserved in the output file.
- Text support is limited to single line text blocks, vertically and horizontally centered.
- Defined Visio styles are not supported. You need to apply styling such as line weight and fill patterns individually to each shape.
- Free-form lines are partially supported. Check any free-form lines in the SVGZ output to see if they are rendered properly.
- Bitmap image support is limited to 32, 24, or 8 bits per pixel. Be aware that bitmap images scale very poorly. The general rule of thumb is to click the Visio Insert menu and select Picture > From File... to create a bitmap that translates correctly. If you have a bitmap that is stored in an unsupported format (such as a four-color bitmap), try to open the file in Windows Paint and use Save as on the File menu to save the drawing as a 24-bit bitmap. The 24-bit bitmap converts to SVG properly.
- Bitmaps with transparent backgrounds are not transparent after export.
- Bitmaps must be resized in Visio 2002 proportionately or they do not appear correctly. To resize non-proportionately, first resize the bitmap to the desired dimensions in Visio 2002, then cut and paste into Windows Paint. Select and cut the bitmap from Windows Paint and then use the Paste Special command in Visio 2002 to paste the bitmap as a Device Independent Bitmap.
- OLE objects are not supported.
- Shapes with multiple geometric sections with interacting fill patterns are not supported. Each geometric section fills independently.
- Translucent shapes and shapes with shadows are not supported.

## Tips on Improving Performance When Using the GSL

Some complex AutoCAD drawings can reduce the performance of your graphics due to issues with the import or the complexity of the drawings. The following tips should improve performance:

- Reduce the geometric complexity in graphic object background images. If there is excessive detail in an AutoCAD image you are importing, you may have slower performance. For example, fixtures and furniture may be in the original drawings that are not necessary for your graphic.
- Replace jagged lines with straight lines or arcs to make the drawing more efficient. The exporter may render a single line as many individual points and lines. These lines can appear as jagged lines in the imported drawing. Each jagged line represents equations that must be solved, thus slowing your system.
- Replace AutoCAD text with Visio text. AutoCAD text may also import as line segments rather than font text.
- Look for changes to the geometry of imported AutoCAD drawings. Some simple shapes import in surprisingly complex ways. For example, fills may import as many-sided shapes that overlap rather than as the shape they are supposed to fill. See Figure 52 for an example of how a fill can import as a complex shape.



**Figure 52: Complex Geometry After Importing Fill**

- Replace hash marked shapes with a Visio hash pattern, an alternate pattern, or, if the drawing does not need them, delete them. Hash marked shapes in AutoCAD software convert into hundreds of individual line segments that make the computer do extra work.
- Ungroup metafiles before exporting them to SVGZ. Visio 2002 converts the metafile geometry to native Visio geometry during the ungroup process. Geometric shapes that are copied and pasted in from other third-party applications often appear as metafiles in Visio 2002.
- If Visio 2002 is having trouble converting a CAD OLE object to native Visio geometry, try cutting it to the Clipboard (on the Edit menu, click Cut) and then using Paste Special (on the Edit menu, click Paste Special) to paste the file in the Metafile format. Then ungroup the graphic to prepare to export to SVG.



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Published in U.S.A.