

Advanced Graphics Application Help

MS-ADVGRF-0

Code No. LIT-1201850

Software Release 9.0

Issued August 2017

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Introduction

Welcome to the Advanced Graphics Application *Help*.

This Help system describes how to configure and use the Advanced Graphics Application (AGA) to create system graphics for the *Metasys* system. This Help system assumes the user has knowledge of Scalable Vector Graphics (SVG) and how to use the User Graphics Tool (UGT) and the Professional or Standard edition of Microsoft® Visio® 2003, 2007, or 2010 software (32-bit versions only). The Advanced Graphics Application is not supported for use with either Microsoft Visio 2013 or Visio for Office 365.

Summary of Changes

No changes were made to this documents at Release 9.0.

Advanced Graphics Application Overview

The Advanced Graphics Application is an enhanced graphics creation package that provides dynamic graphic capabilities such as animation, color changing, and flashing for the *Metasys* system. The package includes a dynamic example stencil library that is an add-on to the Professional or Standard edition of Microsoft Visio 2003, 2007, or 2010 software.

When you create an advanced graphic using the Graphics Example stencil, the graphic is bound to system data through the System Configuration Tool (SCT) database. After the graphic file is saved, it is inserted as a Graphic object into the *Metasys* system navigation tree.

Advanced graphics are viewed from the *Metasys* system Site Management Portal (SMP) UI framework. With a more comprehensive representation of facility support systems, building operators can easily monitor the health of the system on a more intuitive interface.

Scalable Vector Graphics (SVG)

The SVG file format is an XML-based web standard and is viewable and editable in any text editor, much like HTML documents. The World Wide Web Consortium (www.w3.org) maintains the SVG specification. The Advanced Graphics Application complies with the SVG specification for dynamic SVG graphics. Besides the ability to save SVG files, the Advanced Graphics Application can also save a Zipped Scalable Vector Graphic (SVGZ) file, which is a compressed SVG file.

Professional or Standard Edition of Microsoft Visio Software

The Advanced Graphics Application is designed to work with the Professional or Standard edition of Microsoft Visio 2003, 2007, or 2010 software (32-bit versions only), which refers to symbols as shapes. Visio drawings use the Visio Drawing (VSD) file format. The Professional or Standard edition of Microsoft Visio 2003, 2007, or 2010 software includes a stencil sheet mechanism that allows you to create stencil libraries. The Advanced Graphics Application includes the Graphics Example stencil, a library of dynamic HVAC components.

Important: The Advanced Graphics Application is not supported for use with either Microsoft Visio 2013 or Visio for Office 365.

Advanced Graphics Generation Application

The Advanced Graphics Application is an add-on graphics generation program used to create animated graphics in the Professional or Standard edition of Microsoft Visio 2003, 2007, or 2010 software. Access the Advanced Graphics Application by selecting **Tools > Add-Ons > AGAActionCodeAddOn** in the Professional or Standard edition of Microsoft Visio 2003, 2007, or 2010 software. This add-on application allows you to configure the dynamic capabilities for graphics using *Action Codes* (*User Actions* and *Dynamic Features*), the *Expression Builder*, and the *AGA Binder*. See *Figure 1*.

The Advanced Graphics Add-On screen consists of three distinct sections: A, B, and C ([Figure 1](#)). Use Section A to select the user actions and dynamic features you want to define. After you make these choices, use Section B to select which of the checked actions or dynamic features you want to work with. When you make your selections, Section C reveals any required parameters for that action or dynamic feature. For example, [Figure 1](#) shows the parameters for the Left Click action code. For details on this process, see [Adding Action Codes to a Shape](#).

Figure 1: Advanced Graphics Add-On Screen

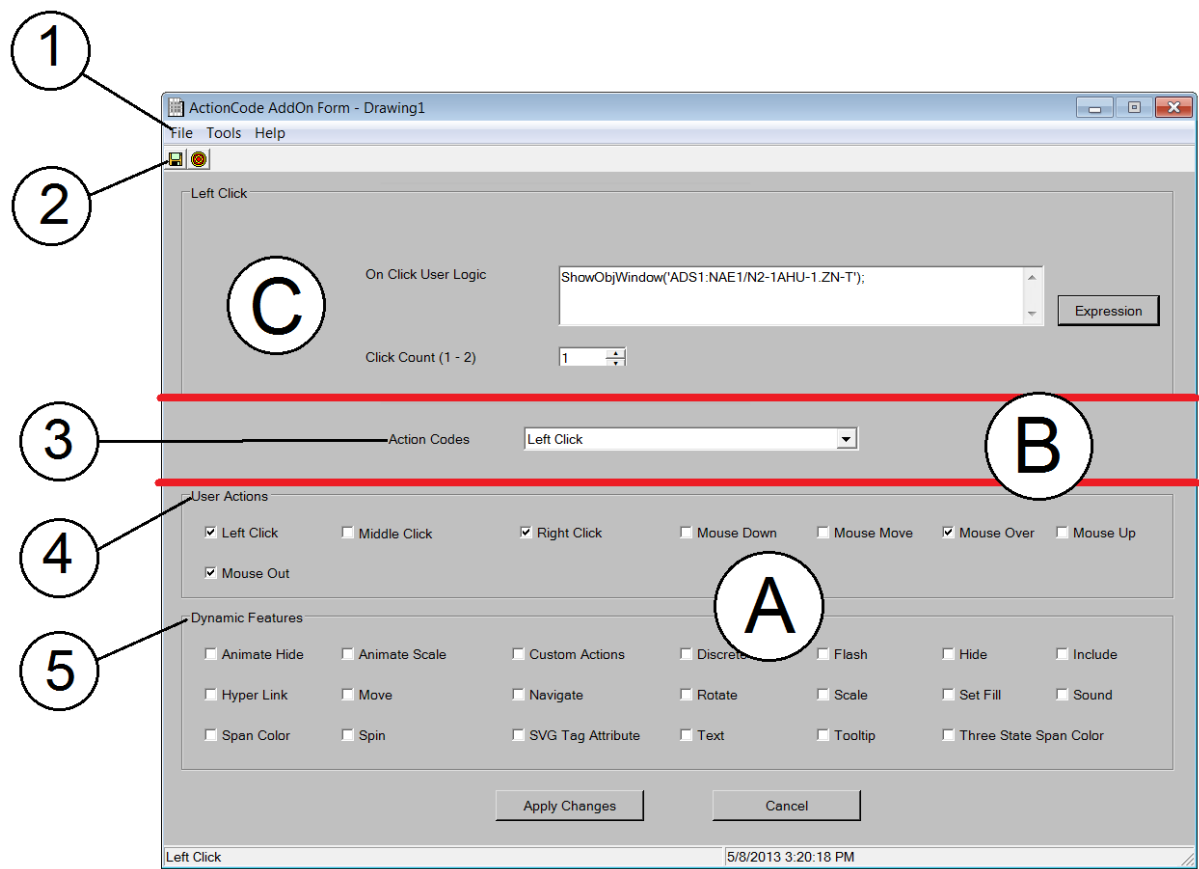


Table 1: Advanced Graphics Screen Callouts

Callout	Name
1	Menus
2	Toolbar
3	List of Selected Action Codes
4	User Actions
5	Dynamic Features

Note: To keep the Advanced Graphics Add-On screen always open while defining user actions and dynamic features, right-click a blank spot on the graphic away from the Add-On screen. Then, if you are using Visio 2003, select View > Custom Properties Window. The Custom Properties Window appears. If you are using Visio 2007 or 2010, select Data > Shape Data. Dock the window. Now, the Add-On screen remains displayed while you work with the various shapes on the graphic, and your changes are saved immediately.

Menus

[Table 2](#) describes the options of the Advanced Graphics Application menus.

Table 2: Menu Options

Menu	Option	Description
File	Save (Ctrl+S)	Saves the current graphic file in SVG or SVGZ format to a location on the hard disk or on the network to store the graphic.
	Save As (F12)	Saves the current graphic file under a new name.
	Exit (Alt+F4)	Closes the application.
Tools	Graphics Binding (Ctrl+G)	Launches the AGA Binder.
	Preferences (Ctrl+E)	Launches the AGA Preferences dialog box.
	Precache (Ctrl+P)	Launches the AGA Precache window.
Help	Online Help (Ctrl+F1)	Launches the Advanced Graphics Application <i>Help</i> .
	About AGA	Displays information about the application, including copyright notice.

Toolbar

[Table 3](#) describes the toolbar buttons of the Advanced Graphics Application.

Table 3: Toolbar Buttons

Button	Description
	Saves the current graphic file in SVG or SVGZ format to a location on the hard disk or on the network to store the graphic.
	Launches the AGA Binder.

Preferences

The Advanced Graphics Application launches dialog boxes to verify certain actions to guide you through the program. For example, a dialog box appears asking whether you want to save your changes when you exit the Advanced Graphics Application. Once you become familiar with the application, you can turn off some of these messages from the Preferences menu. [Figure 2](#) shows and [Table 4](#) describes the options of the Preferences dialog box.

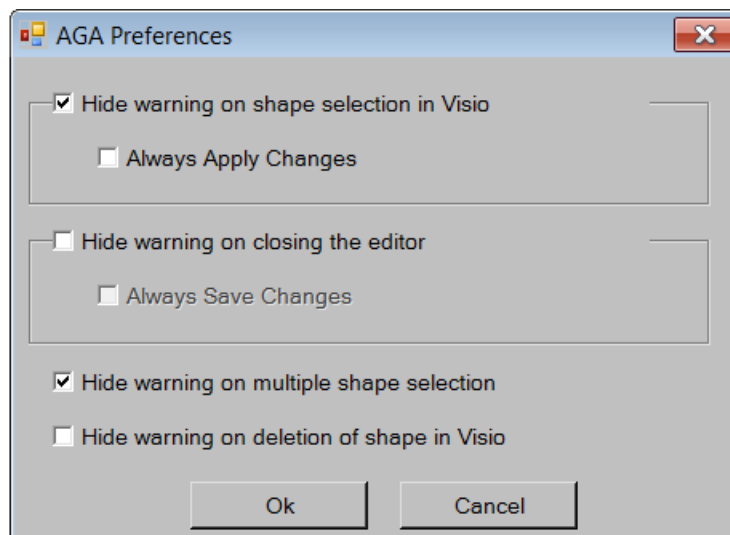
Figure 2: AGA Preferences Dialog Box

Table 4: AGA Preferences Dialog Box

Option ¹	Description
Hide warning on shape selection in Visio	Prevents the warning message from appearing when selecting a different shape in the Professional or Standard edition of Microsoft Visio 2003, 2007, or 2010 software.
Always Apply Changes	When selected, applies any changes that have not been applied; otherwise, the program discards the changes.
Hide warning on closing the editor	Closes the Advanced Graphics Application without a warning message.
Always Save Changes	Saves all changes without a warning message.
Hide warning on multiple shape selection	Prevents the warning message from appearing when selecting multiple shapes in the Professional or Standard edition of Microsoft Visio 2003, 2007, or 2010 software.
Hide warning on deletion of shape in Visio	Prevents the warning message from appearing when deleting a shape in the Professional or Standard edition of Microsoft Visio 2003, 2007, or 2010 software.

1 [Table 12](#) lists the warning messages that appear in the Advanced Graphics Application. [Table 12](#) also points out the messages that disappear when you use the Preferences options described here.

Precache Feature

The Precache feature allows you to retrieve the values of objects used in your drawing **before** the graphic is rendered, which improves graphic performance. These values are placed in Advanced Graphics memory immediately when you open the graphic in the SMP UI. The drawing is then rendered and the values of all objects appear. If you do not use the Precache feature, the object values are retrieved **after** the graphic appears, which slows down graphic performance. Overuse of the Precache feature may also slow down the system; therefore, we recommend that you specify only the most important objects in the Precache window.

For more information, see [Working with the Precache Definition](#).

Action Codes

An Action Code is the coding information in a shape that specifies the animated presentation of data. For example, you can create an animated spray for a duct humidifier using Action Codes. Action Codes include [User Actions](#) and [Dynamic Features](#).

User Actions

The Advanced Graphics Application triggers the defined dynamic feature in a shape to occur when a user acts upon the shape. [Table 5](#) describes the user actions configurable in the Advanced Graphics Application.

Table 5: User Actions

User Action	Description
Left Click	A left mouse click on a shape. Example: <code>ShowObjWindow('ADS1:NAE1/N2-1.AHU4.OA-T');</code>
Middle Click	A middle mouse click on a shape. Example: <code>setlv('show_legend',true);</code>
Right Click	A right mouse click on a shape. Example: <code>ShowCmdWindow('ADS1:NAE1/N2-1.AHU4.ZN-T');</code>
Mouse Down	The mouse is clicked over a shape. Example: <code>setlv('mouse_down_on_temp',true);</code>

Table 5: User Actions

User Action	Description
Mouse Move	The mouse moves around a shape. Example: <code>setlv('mouse_move_on_map_X',evt.clientX);setlv('mouse_move_on_map_Y',evt.clientY);</code>
Mouse Over	The mouse moves over a shape. Example: <code>setlv('mouse_over_room4',true);</code>
Mouse Up	The mouse is released on a shape. Example: <code>setlv('mouse_down_on_temp',false);</code>
Mouse Out	The mouse moves off a shape. Example: <code>setlv('mouse_over_room4',false);</code>

See the [Creating and Editing an Advanced Graphic \(Overview\)](#) section for the overall process of creating an advanced graphic. Specifically, see the [Adding Action Codes to a Shape](#) and [Configuring Action Codes](#) sections for details on how to add and configure action codes.

Dynamic Features

The dynamics included in the shape deliver the dynamic capabilities for the shape. [Table 6](#) describes the dynamics available in the Advanced Graphics Application.

Table 6: Dynamic Features

Dynamic Feature	Description
Animate Hide	Hides and displays the shape so it appears to fade in and out of sight continuously at a defined rate.
Animate Scale	Increases and decreases the size of the shape so it appears to stretch and return to normal size continuously at a defined rate.
Custom Actions	Allows multiple JavaScript® statements for advanced functionality. This option allows you to manually type the coding.
Discrete Color	Changes the color of the shape from a list of colors. For example, the shape changes from yellow to red when the Analog Value goes from Low Alarm to High Alarm.
Flash	Makes the shape change from one color to another. For example, the shape flashes between two colors continuously if the value goes beyond a maximum point.
Hide	Makes the shape disappear.
Hyper Link	Links a URL to the shape and opens in a separate window. For example, the shape jumps to a user guide or Help file.
Include	Attaches a JavaScript file to a shape.
Move	Moves the shape from one location on the graphic to another.
Navigate	Launches another advanced graphic file or item (for example, an Analog Value window).
Rotate	Rotates the shape clockwise the specified number of degrees around an axis.
Scale	Changes the size of a shape.
Set Fill	Changes the fill color of a shape.
Sound	Attaches a sound file (.wav) to a shape. For example, the shape makes a sound if the device reaches abnormal values.
Span Color	Changes the color of a shape to a color between two defined colors based on a numeric value. For example, the shape appears purple halfway between red and blue.

Table 6: Dynamic Features

Dynamic Feature	Description
Spin	Makes the shape spin clockwise or counterclockwise on its axis at a defined rate.
SVG Tag Attribute	Adds advanced SVG coding to the shape.
Text	Changes the string in a text box based on the value of an expression. For example, the text box displays the Present Value of an object.
Three State Span Color	Changes the color of a shape among three colors based on the value of a variable. For example, a Temperature Bulb changes from blue to yellow to red as the temperature changes from -18°C (0°F) to 21°C (70°F) to 43°C (110°F). A common color scheme is from green to yellow to red.
Tooltip	Adds Tooltip text to a shape.

See the [Creating and Editing an Advanced Graphic \(Overview\)](#) section for the overall process of creating an advanced graphic. Specifically, see the [Adding Action Codes to a Shape](#) and [Configuring Action Codes](#) sections for details on how to add and configure action codes. For background information on JavaScript, consult a reference book, such as *JavaScript: The Definitive Guide* by David Flanagan.

Expression Builder

The Expression Builder allows you to build expressions to bind data to a shape using Graphic Object References. The Expression Builder is shown in [Figure 3](#) and described in [Table 7](#).

Expression Syntax

The syntax for an expression depends on which action code or dynamic feature you have selected; however, for the logic functions, there is a common syntax that applies:

Logic Function('Site Director:NxE Name/Point Reference.Attribute ID',me);

Example for reading the present value of a zone temperature:

bsv('ADS1:NAE1/N2-1.ZN-T.85',me);

The *Logic Function* is an abbreviation of the action that the statement is to perform. For example, **bsv** means read a bound string value. [Table 8](#) explains each of the valid logic functions.

The *Site Director Name* and *NxE Name*, along with the *Point Reference*, describe the location and name of the point. A colon separates the Site Director and NAE/NCE names, which usually consist of an ADS:NxE combination. The Point Reference is separated from the NxE by a forward slash.

The *Attribute ID* is a number that the *Metasys* system uses to identify a particular attribute. For example, the attribute number for the Present Value of any object is 85. Other popular attribute numbers are 512 (Status), 28 (Description), and 2390 (Name). The Expression Editor determines the attribute ID when you select the object's attribute. If no attribute ID or an invalid attribute ID is specified, an error in the Java® console occurs when you display the graphic during runtime.

Product internationalization is the reason that attribute IDs are used instead of attribute names. For a list of all attributes with their IDs, refer to the *Metasys System Enumeration Sets Technical Bulletin (LIT-12011361)*.

The **me** keyword at the end of the statement is a convention used by the Advanced Graphics Application to enable the dynamic feature to sign up for any change in value of the monitored attribute. For example, if the feature is Discrete Color, the **me** keyword allows for a change in color to occur when the status of the linked attribute changes.

Figure 3: Expression Builder

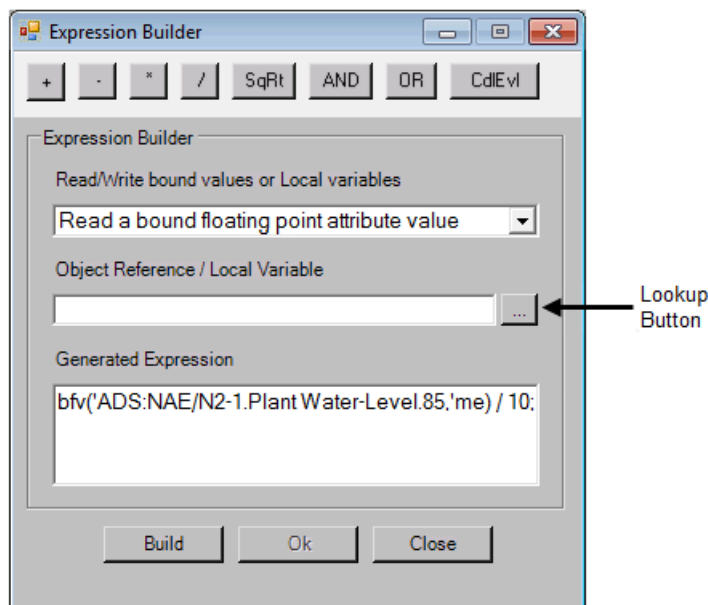
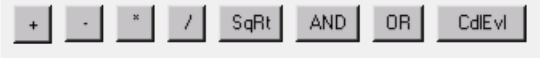


Table 7: Expression Builder

Option	Description
Operator Buttons	Click the button to insert its logical operation into the Generated Expression field.  Add Subtract Multiply Divide Square Root AND Operator OR Operator Conditional Evaluation Note: You can also use the NOT (!) and TERNARY (?) operators by editing the generated expression.
Read/Write bound values or Local variables	Provides a list of user logic function templates that read or write bound values or local variables. Bound values are connected to an object that exists in the <i>Metasys</i> system database, whereas local variables are values that can be referenced by expressions in the graphic. See Table 8 for descriptions of the logic functions.
Object Reference/Local Variable	Enter the local variable or Object Reference of the field point for which you want the selected logic function template to operate. Click the Lookup button to bind data using the AGA Binder.
Generated Expression	Displays the expression (based on the Read/Write bound values or Local variables selection and the Object Reference/Local Variable text) after clicking Build.

Logic Functions

Logic functions aid in programming the dynamic features of a shape. Logic functions trigger dynamics in the shape based upon the attached system data. Insert logic functions using the Expression Builder. [Table 8](#) describes the logic functions available in the Advanced Graphics Application.

Table 8: Logic Functions

Variable	Script	Description
Read a bound floating point attribute value	bfv	Reads an Object Reference in the Network Automation Engine (NAE)/Network Control Engine (NCE)/Network Integration Engine (NIE) or Application and Data Server (ADS)/Extended Application and Data Server (ADX), and returns a floating value. Note: Use this function to retrieve the precise value of an attribute (15 significant digits). For example, you could use it for converting temperature calculations (°F to °C) or for providing a value to non-textual action types such as Discrete Color. Example: bfv('ADS1:NAE1/N2-1.AHU4.RM-T.85, me)
Read a bound Boolean attribute value	bbv	Reads an Object Reference in the NAE/NCE/NIE or ADS/ADX, and returns a Boolean value. Note: Use this function to determine whether an object is in a specific state (for example, on/off or alarm/normal). This logic function converts the text to a Boolean true or false value. Example: bbv('ADS1:NAE1/N2-1.AHU4.SF-S.85, me)
Read a bound integer attribute value	biv	Reads an Object Reference in the NAE/NCE/NIE or ADS/ADX, and returns an integer value. Note: Use this function in cases where you do not want to translate the state/mode/type set (enumeration) value of an object to text. For example, use this option to compare the object's status (high alarm to low alarm). Example: biv('ADS1:NAE1/N2-1.AHU4.AV1.85, me)
Read a bound string value	bsv	Reads an Object Reference in the NAE/NCE/NIE or ADS/ADX, and returns a string value. Note: Use this function to display the state of an object as text. Enumerated attributes are returned as text instead of numbers (for example, Clean/Dirty instead of 0/1). Analog attributes are returned as rounded values with units (for example, 74.2 Deg F instead of 74.1873547683635.) The bsv script is commonly used with the Text action code. Example: bsv('ADS1:NAE1/N2-1.AHU4.FILTER.28, me)
Read a local floating point value	lfv	Reads a local variable, and returns a floating value.
Read a local boolean point value	lbv	Reads a local variable, and returns a Boolean value.
Read a local integer point value	liv	Reads a local variable, and returns an integer value.
Read a local string point value	lsv	Reads a local variable, and returns a string value.

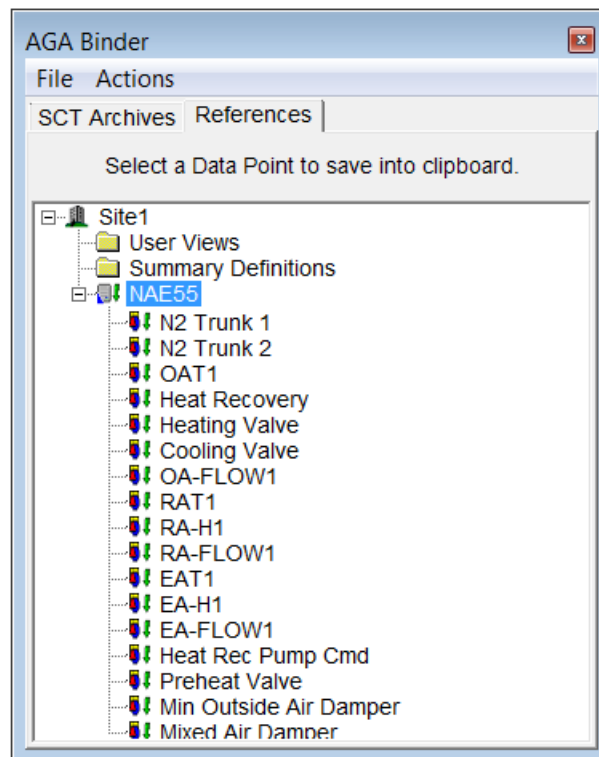
Table 8: Logic Functions

Variable	Script	Description
Select Color	—	Allows you to assign a color from a color selection window. The Expression Builder can also use an RGB (red/green/blue) number given in hexadecimal format to identify the color. This format contains # and three sets of numbers representing the color intensity of red, green, and blue (for example, red would be #340000).
Sets a local value	setlv	Modifies the value of a local variable.
Show Command Window	ShowCmdWindow	Displays the command window of the specified item/object.
Show Object Window	ShowObjWindow	Displays the default view/window of the specified item/object.

See the [Creating and Editing an Advanced Graphic \(Overview\)](#) section for the overall process of creating an advanced graphic. Specifically, see the [Using the Expression Builder](#) section for details on how to build expressions.

AGA Binder

The AGA Binder assists you in building expressions by logging in to and selecting field points and references from the SCT. [Figure 4](#) shows the AGA Binder with the References tab active, and [Table 9](#) describes the AGA Binder menus and tabs. The fully qualified object reference of the selected item/object is copied to the Microsoft Windows® clipboard so you can paste it into the expression.

Figure 4: AGA Binder**Table 9: AGA Binder**

Menu/Tab	Item	Description
SCT Archives		Displays the archives in the SCT.
References		Displays the Navigation Tree of the selected SCT archive for choosing field point references.

Table 9: AGA Binder

Menu/Tab	Item	Description
File	Exit (Ctrl+Q)	Closes the AGA Binder.
Actions	Login (Ctrl+L)	Launches the SCT Login dialog box to log in to the local SCT or an SCT on the network. To activate and use the features of the AGA Binder, you must first log in to the SCT using this menu item.
	Refresh Archives (Ctrl+R)	Refreshes the data appearing in the AGA Binder to match the current archives.
	Get Field Points (Ctrl+G)	Displays the field points for the device.
	Show Attributes (Ctrl+H)	Launches the Attribute dialog box that lists the attributes of the selected object.

See the [Creating and Editing an Advanced Graphic \(Overview\)](#) section for the overall process of creating an advanced graphic. Specifically, see the [Using the AGA Binder](#) section for details on how to bind data to shapes.

Graphics Example Stencil

The Graphics Example stencil contains prebuilt dynamic shapes for creating dynamic system graphics. Use the Professional or Standard edition of Microsoft Visio 2003, 2007 or 2010 software and the Advanced Graphics Generation Add-On to modify the shapes to suit the needs of the facility. [Table 10](#) lists the sample shapes and their prebuilt action codes. For more information on the action codes, see [Table 5](#) and [Table 6](#).

Table 10: Graphics Example Shapes

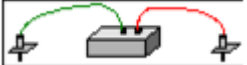
Shape	Shape Name	Action Codes
	Differential (Diff) Pressure	Left Click - displays the default view/window of the object Right Click - displays the command window of the object Animate Hide - displays/hides the text label when in high/low alarm Discrete Color - displays a different color for the Present Value text box based on the object's status¹ Sound - plays a sound when in high/low alarm SVG Tag Attribute - sets the object opacity Text - displays the Present Value of the object Tooltip - displays the object name
	Humidity Sensor	Left Click - displays the default view/window of the object Right Click - displays the command window of the object Animate Hide - displays/hides the text label when in high/low alarm Discrete Color - displays a different color for the Present Value text box based on the object's status¹ Sound - plays a sound when in high/low alarm SVG Tag Attribute - sets the object opacity Text - displays the Present Value of the object Tooltip - displays the object name

Table 10: Graphics Example Shapes

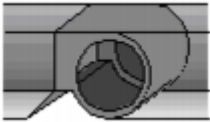
Shape	Shape Name	Action Codes
	Return Fan ²	• Left Click - displays the default view/window of the object • Right Click - displays the command window of the object • Mouse Out - hides the yellow command and status box • Mouse Over - displays the yellow command and status box • Animate Hide - displays/hides the text label when in high/low alarm • Discrete Color - displays a different color for the Present Value text box based on the object's status¹ • Hide - hides the yellow command and status box • Span Color - changes color between red and green to indicate low and high alarm • SVG Tag Attribute - sets the object opacity • Text - displays the Present Value of the object
	Right Horizontal (Horz) Water Pump	• Left Click - displays the default view/window of the object • Right Click - displays the command window of the object • Mouse Out - hides the tooltip • Mouse Over - displays the tooltip • Animate Hide - displays/hides the text label when in high/low alarm • Discrete Color - displays a different color for the Present Value text box based on the object's status¹ • Discrete Color - changes the impeller red when off and green when on • Flash - changes the impeller color between white and red to indicate low and high alarm • Spin - moves the impeller clockwise when running • SVG Tag Attribute - sets the object opacity • Text - displays the Present Value of the object • Tooltip - displays the object name
	RS9100	• Left Click - displays the default view/window of the object • Right Click - displays the command window of the object • Animate Hide - displays/hides the text label when in high/low alarm • Discrete Color - displays a different color for the Present Value text box based on the object's status¹ • Sound - plays a sound when in high/low alarm • SVG Tag Attribute - sets the object opacity • Text - displays the Present Value of the object • Tooltip - displays the object name

Table 10: Graphics Example Shapes

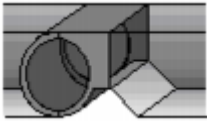
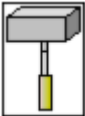
Shape	Shape Name	Action Codes
	Supply Fan ²	• Left Click - displays the default view/window of the object • Right Click - displays the command window of the object • Mouse Out - hides the yellow command and status box • Mouse Over - displays the yellow command and status box • Animate Hide - displays/hides the text label when in high/low alarm • Discrete Color - displays a different color for the Present Value text box based on the object's status ¹ • Hide - hides the yellow command and status box • Span Color - changes color between red and green to indicate low and high alarm • SVG Tag Attribute - sets the object opacity • Text - displays the Present Value of the object
	Temperature (Temp) Sensor	• Left Click - displays the default view/window of the object • Right Click - displays the command window of the object • Animate Hide - displays/hides the text label when in high/low alarm • Discrete Color - displays a different color for the Present Value text box based on the object's status ¹ • Sound - plays a sound when in high/low alarm • SVG Tag Attribute - sets the object opacity • Text - displays the Present Value of the object • Tooltip - displays the object name
	T-4000	• Left Click - displays the default view/window of the object • Right Click - displays the command window of the object • Animate Hide - displays/hides the text label when in high/low alarm • Discrete Color - displays a different color for the Present Value text box based on the object's status ¹ • Sound - plays a sound when in high/low alarm • SVG Tag Attribute - sets the object opacity • Text - displays the Present Value of the object • Tooltip - displays the object name
	TE-6700	• Left Click - displays the default view/window of the object • Right Click - displays the command window of the object • Animate Hide - displays/hides the text label when in high/low alarm • Discrete Color - displays a different color for the Present Value text box based on the object's status ¹ • Sound - plays a sound when in high/low alarm • SVG Tag Attribute - sets the object opacity • Text - displays the Present Value of the object • Tooltip - displays the object name

Table 10: Graphics Example Shapes

Shape	Shape Name	Action Codes
	TC9100 Stat	Left Click - displays the default view/window of the object Right Click - displays the command window of the object Animate Hide - displays/hides the text label when in high/low alarm Discrete Color - displays a different color for the Present Value text box based on the object's status¹ Sound - plays a sound when in high/low alarm SVG Tag Attribute - sets the object opacity Text - displays the Present Value of the object Tooltip - displays the object name
	TMZ	Left Click - displays the default view/window of the object Right Click - displays the command window of the object Animate Hide - displays/hides the text label when in high/low alarm Discrete Color - displays a different color for the Present Value text box based on the object's status¹ Sound - plays a sound when in high/low alarm SVG Tag Attribute - sets the object opacity Text - displays the Present Value of the object Tooltip - displays the object name
	Water Pump	Left Click - displays the default view/window of the object Right Click - displays the command window of the object Mouse Out - hides the tooltip Mouse Over - displays the tooltip Animate Hide - displays/hides the text label when in high/low alarm Discrete Color - displays a different color for the Present Value text box based on the object's status¹ Discrete Color - changes the impeller red when off and green when on Flash - changes the impeller color between white and red to indicate low and high alarm Spin - moves the impeller clockwise when running SVG Tag Attribute - sets the object opacity Text - displays the Present Value of the object Tooltip - displays the object name

¹ Where 0=White, 10=Yellow, 15=Yellow, 30=Red, 34=Red, 70=Gray, 108=#8000, and 112=Black.

² The Return Fan and Supply Fan shapes have Cmd Name, Cmd Desc, Sts Name, and Sts Desc labels with Text action codes. Cmd Name and Cmd Desc reference the command output object for the mechanical device. Sts Name and Sts Desc reference the status input object for the mechanical device.

Binding and Aliasing

The Advanced Graphics Application provides two methods for creating advanced graphics and binding data to shapes. The first method is to use the Graphics Example shapes as defined and modify the object references in the shape's custom properties (Visio 2003) or shape data (Visio 2007 and 2010). The second method is to create your own custom shapes or use the Graphics Example shapes and modify the action codes to create customized dynamic shapes.

The shapes in the Graphics Example stencil have custom properties or shape data entries on their right-click menus. The object reference of all the shape's action codes can be set using the custom properties ([Figure 5](#)) or shape data ([Figure 6](#) and [Figure 7](#)). See the [Configuring Graphics Example Shapes](#) section for details on how to edit the custom properties or shape data.

Figure 5: Custom Properties on a Temperature Sensor (Visio 2003)

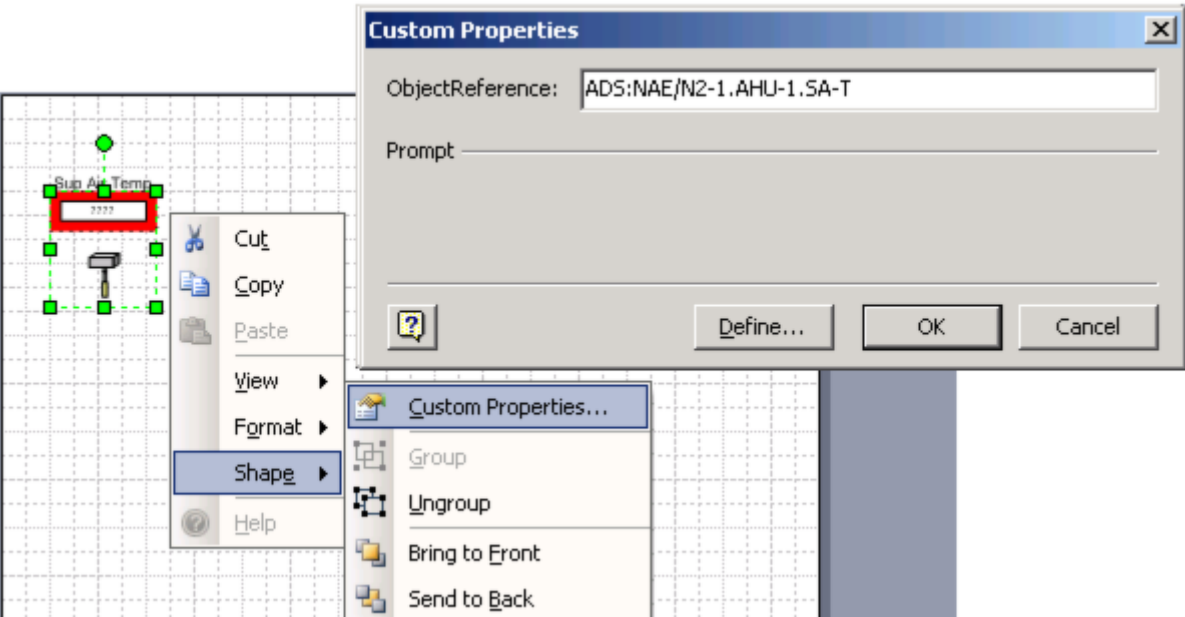


Figure 6: Shape Data on a Pre-Heat Coil (Visio 2007)

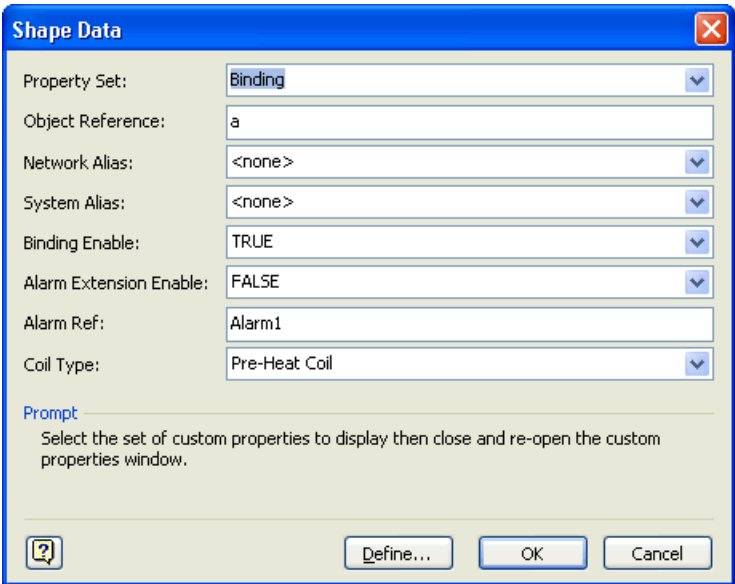
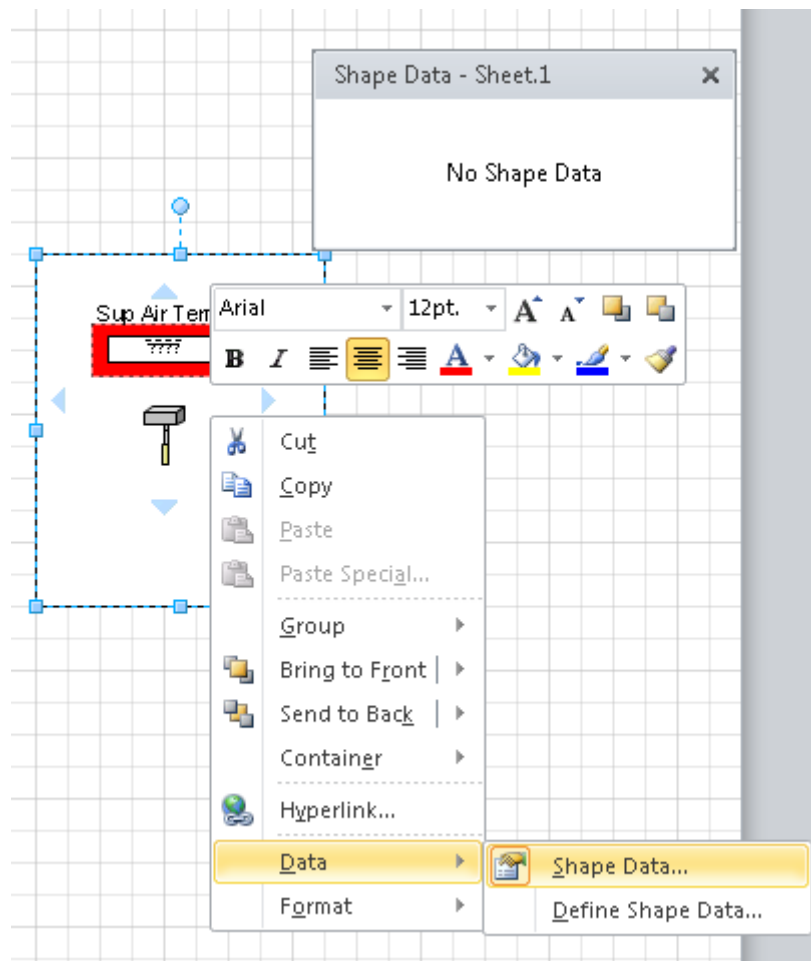


Figure 7: Shape Data on a Temperature Sensor (Visio 2010)



If you choose to modify the action codes of a shape from the Graphics Example stencil, the custom properties or shape data of that shape do not function after editing the action codes using the Advanced Graphics Application. If you want to change any part of an existing Graphics Example shape (for example, you want to keep all of the dynamics configured, but you want to change or add a dynamic), you cannot modify the custom properties or shape data to indicate the object reference for that shape. You must use the Advanced Graphics Application to add the object reference to each of the defined action codes and make the desired action code changes or additions. The [Configuring Action Codes for a Return Fan Shape Example](#) section describes how to configure an existing Graphics Example shape to use a different action code and how to add the object references to the defined action codes.

For information on creating new shapes and adding them to new stencils, refer to the Professional or Standard edition of Microsoft Visio 2003, 2007, or 2010 software documentation. Then, add the new shape to your advanced graphic and use the action codes to create the desired dynamics. For details on configuring action codes, see the [Adding Action Codes to a Shape](#) section.

Aliased graphics employ a technique of string substitution in object references to allow a single graphic to be used with multiple mechanical systems. For example, create a single graphic to use for all Variable Air Volume (VAV) controllers, then create an alias to use for the other graphics. For an example on how to create an aliased graphic, see the [Creating an Aliased Graphic](#) section.

User Graphics Tool

The *Metasys* system includes a User Graphics Tool (UGT) that accepts standard graphics. The graphics provide a visual representation of the monitored systems and 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 the building systems and control processes.

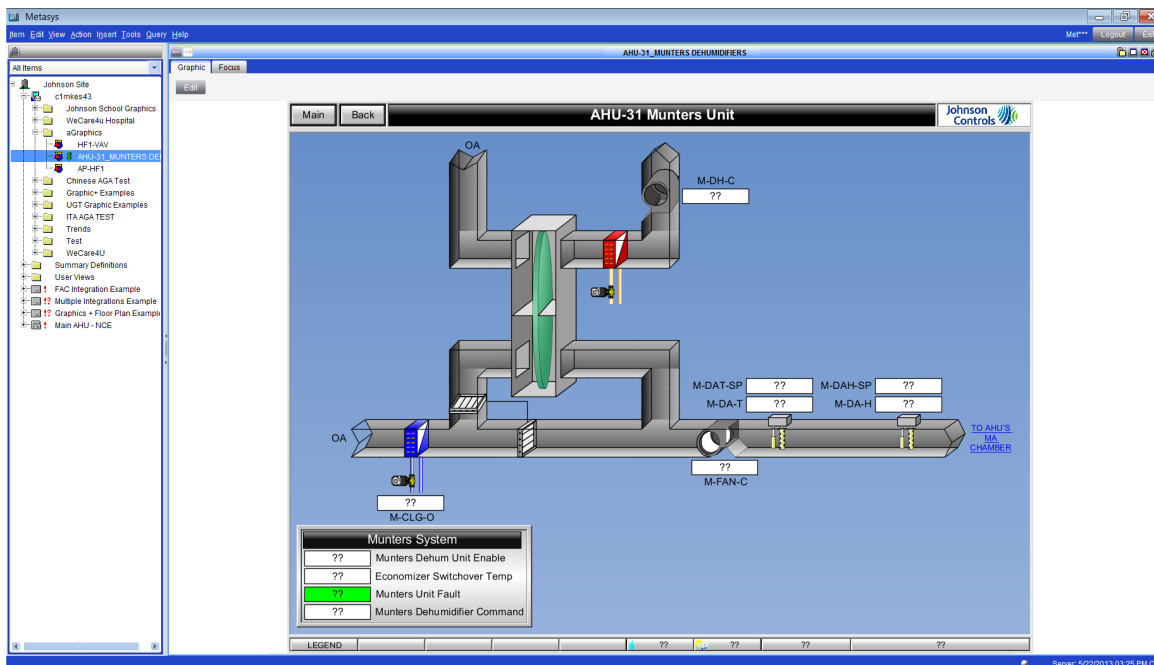
Advanced Graphics Viewing

The SMP UI displays advanced graphics with real-time controller field point data, and allows building operators to command and update points. Advanced graphics allow you to use a wider range of dynamics in your system graphics. After selecting an advanced graphic in the *Metasys* system navigation tree, the advanced graphic appears in the SMP UI.

In the SMP UI, advanced graphics do not offer the functionality and buttons present in the UGT. If you click the Edit button, a toolbar appears that allows you to replace the current graphic with a new advanced graphic using  or clear the current advanced graphic using the Clear button.

[Figure 8](#) shows an advanced graphic viewed in the SMP UI. See [Viewing a Graphic](#).

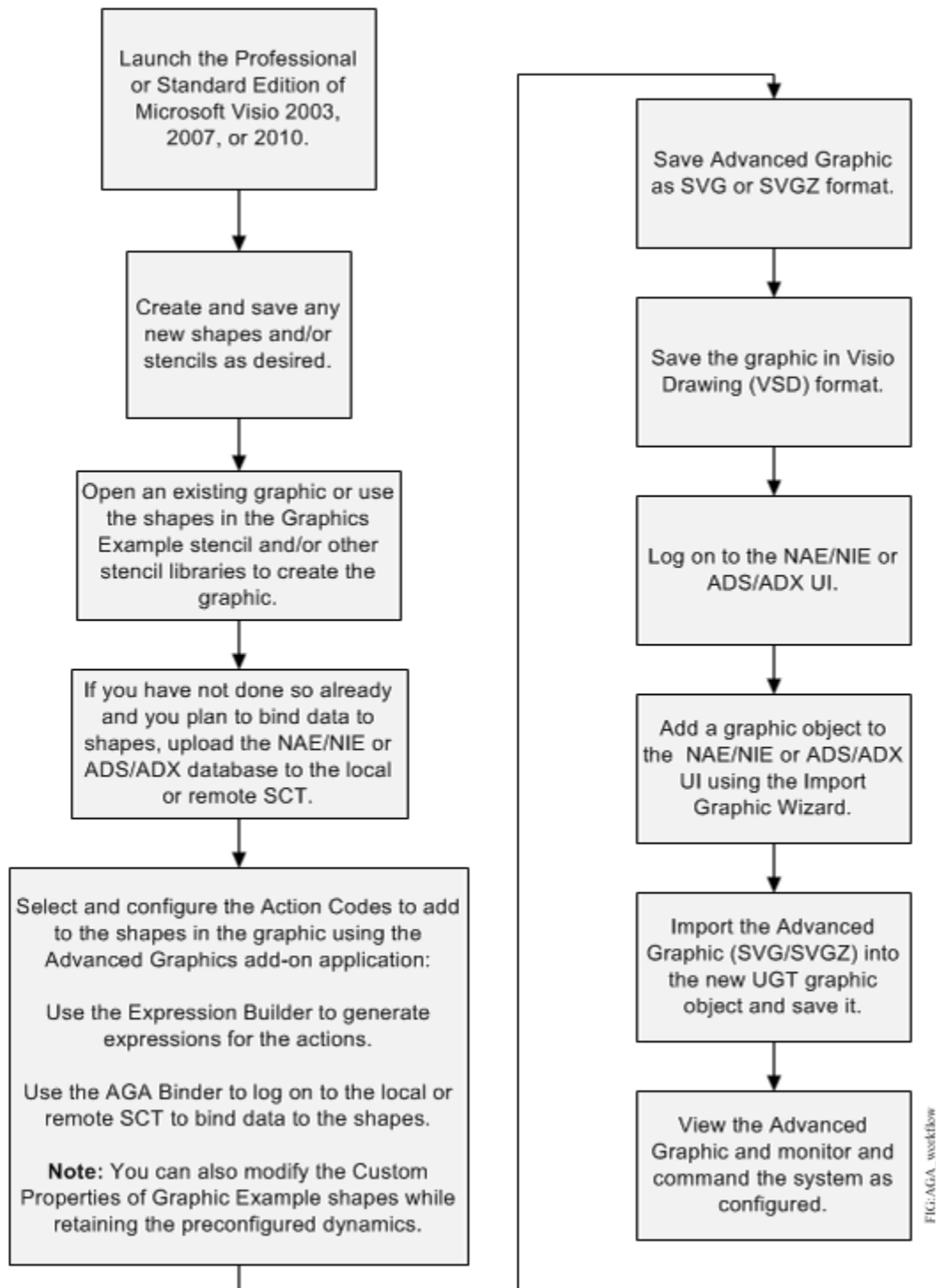
Figure 8: Advanced Graphic



Workflow

[Figure 9](#) shows the workflow for creating and viewing advanced graphics.

Figure 9: Advanced Graphics Workflow Diagram



Advanced Graphics Steps

Creating and Editing an Advanced Graphic (Overview)

Use this procedure to create graphics using existing shapes in the Graphics Example stencil with the Advanced Graphics Application and Visio Professional 2003, 2007, or 2010 software. Both of these procedures require you to work with the Visio software source file, and then place the new graphic in the *Metasys* system or replace the existing graphic with a new graphic. See the [Workflow](#) section.

Note: If desired, create and save any new shapes and stencils for use in your graphic as instructed in the Professional or Standard edition of Microsoft Visio 2003, 2007, or 2010 software product documentation.

1. In the Professional or Standard edition of Microsoft Visio 2003, 2007, or 2010 software, open an existing graphic or create a new graphic (Visio drawing in VSD format). Use the shapes in the Graphics Example stencil and other stencil libraries to create the graphic in the drawing workspace.

Note: To access the Graphics Example stencil, select File > Shapes > Graphics Example.

2. Configure the shapes for the preferred dynamic features and bind the graphic with field point data.
3. Log in to the SMP UI.
 - To bind data to existing shapes in the Graphics Example stencil, see the [Configuring Graphics Example Shapes](#) section.
 - To use the Precache feature, see [Working with the Precache Definition](#).
 - To configure and bind data to shapes using action codes, see the [Adding Action Codes to a Shape](#) section.

Note: If you want to create an aliased graphic (for example, one graphic used for all VAVs), see the [Creating an Aliased Graphic](#) section.

4. If you are creating a new graphic, insert a graphic object into the SMP UI and import the advanced graphic. See the [Inserting an Advanced Graphic to the UGT](#) section.

If you are replacing an existing advanced graphic with a new advanced graphic, display the advanced graphic you are replacing and go to Step 10 in [Inserting an Advanced Graphic to the UGT](#).

Configuring Graphics Example Shapes

Use this procedure to configure the custom properties of the shapes in the Graphics Example stencil. Graphics Example shapes are already configured for dynamic capabilities. Modify the custom properties to bind the shapes to field point data.

1. If you are using Visio 2003, right-click the shape and then click Shape > Custom Properties. The Custom Properties dialog box appears. See [Figure 5](#). If you are using Visio 2007 or 2010, right-click the shape and then click **Data > Shape Data**. The Shape Data dialog box appears. See [Figure 7](#).

2. Use the AGA Binder to locate and copy the fully qualified object reference you want to bind to the shape. For details on how to use the AGA Binder, see the [Using the AGA Binder](#) section.

Note: Do not enter attribute-level references when using this method.

3. Paste the fully qualified object reference in the ObjectReference field of the Custom Properties or Shape Data dialog box.
4. Click **OK**.
5. From the Visio software File menu, select **Save Advanced Graphics** to save the changes to the graphic in the SVG or SVGZ file.

Note: Alternatively, you can click **Save** in the Advanced Graphics Application or select **Save** from the Advanced Graphics Application File menu.

The first time you save the graphic, the Save As dialog box appears. Select a location on the hard disk or on the network to store the graphic. Type a name for the graphic in the File name box. Then select SVG or SVGZ format and click **Save**.

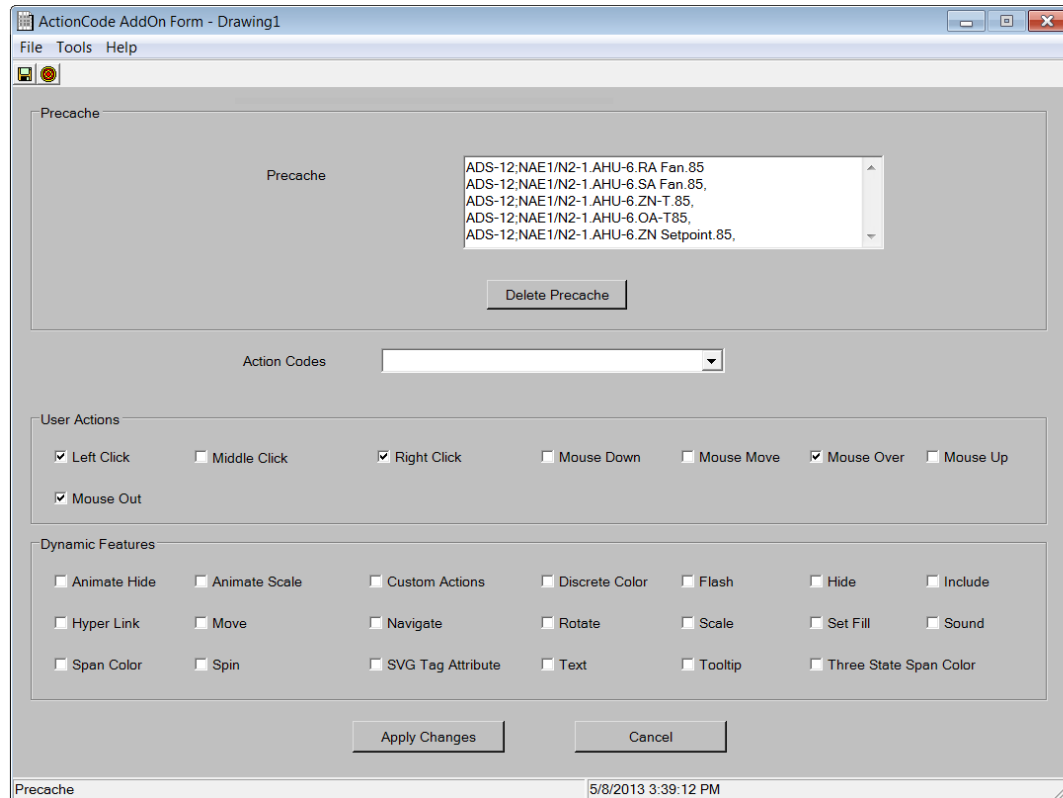
6. On the Visio software File menu, click **Save** to save the changes to the Visio drawing in VSD format. The VSD file is the file format used by the Professional or Standard edition of Microsoft Visio 2003, 2007, or 2010 software. The VSD drawing is the file to open when you want to edit a graphic using the Professional or Standard edition of Microsoft Visio 2003, 2007, or 2010 software and the Advanced Graphics Application.

Note: Make sure you click an empty space on the drawing workspace before saving. If one of the shapes in the graphic is selected, the application only saves changes to that shape.

Working with the Precache Definition

1. On the Tools menu, click **Precache**. The Precache window appears ([Figure 10](#)).

Figure 10: Precache Window



2. Add the objects you want to precache while using the Advanced Graphics Application.

Note: To delete all items in the Precache definition, click **Delete Precache**. If you click Delete Precache and apply the changes, there is no undo. The Precache is emptied.

If you would like to delete one item from the list, manually remove the item from the list by selecting it and pressing the Delete key.

3. Click **Apply Changes** to save the settings.

Adding Action Codes to a Shape

Use this procedure to add dynamic capabilities, such as spinning, flashing, and rotating, to a shape.

1. In the Professional or Standard edition of Microsoft Visio 2003, 2007, or 2010 software, select a shape.
2. On the Tools menu, click **Add-Ons > AGAActionCodeAddOn**. The Advanced Graphics Application main screen, ActionCode AddOn Form, appears. See [Figure 1](#).
3. Click to select the check boxes for the preferred User Actions and Dynamic Features for the shape. The selected User Actions and Dynamic Features appear in the Action Codes drop-down menu. See [Table 5](#) and [Table 6](#) for information on each User Action and Dynamic Feature.
4. In the Action Codes box, select and configure the User Actions and Dynamic Features assigned to the shape. The configuration menus for the Action Codes appear in the top panel of the Advanced Graphics Application screen. See the [Configuring Action Codes](#) section for information on how to configure each of the Action Codes. Some of the Action Codes use the Expression Builder and the AGA Binder. See the [Using the Expression Builder](#) and the [Using the AGA Binder](#) sections for information on how to create expressions and bind data.

- Click **Apply Changes** after configuring all Action Codes for the shape.
- On the Visio software File menu, click **Save Advanced Graphics** to save the changes to the graphic in the SVG or SVGZ file.

Note: Alternatively, you can click the **Save** button in the Advanced Graphics Application or select **Save** from the Advanced Graphics Application's File menu.

The first time you save the graphic, the Save As dialog box appears. Select a location on the hard disk or on the network to store the graphic. Type a name for the graphic in the File name box. Then select SVG or SVGZ format and click **Save**.

- On the Advanced Graphics File menu, click **Exit** to close the Advanced Graphics Application.
- Perform Step 1 through Step 7 for each shape in the graphic that you want to animate.

Note: You can configure individual action codes on parts of the graphic and then group them together in Visio software and configure action codes for the grouped section as well.

- On the Visio software File menu, click **Save** to save the changes to the Visio drawing in VSD format. The VSD file is the file format used by the Professional or Standard edition of Microsoft Visio 2003, 2007, or 2010 software. The VSD drawing is the file to open when you want to edit a graphic using the Professional or Standard edition of Microsoft Visio 2003, 2007, or 2010 software and the Advanced Graphics Application.

Note: Make sure you click an empty space on the drawing workspace before saving. If one of the shapes in the graphic is selected, the application only saves changes to that shape.

- Go to Step 3 in the [Creating and Editing an Advanced Graphic \(Overview\)](#) section.

Configuring Action Codes

Action Codes are the coding information in a shape that specify the animated presentation of data. Use combinations of Action Codes to create an animation for your shapes. See the [Action Codes](#) section and [User Actions](#) for descriptions of the Action Codes, and see the following sections for help on how to configure the Action Codes.

Animate Hide

In this example ([Figure 11](#)), Animate Hide changes a shape to appear and disappear repeatedly every 2 seconds when the current alarm status of a zone temperature is either Low Alarm or High Alarm.

Figure 11: Animate Hide Dynamic Feature Configuration

- In the **Action Codes** box, click **Animate Hide**.
- Select the amount of time in seconds you want the animation to occur on the **Duration** menu.

3. Type the desired logic function expression in the **Begin Animation Expression** text box or click **Expression** to use the Expression Builder. For more information, see [Table 8](#) and the [Using the Expression Builder](#) section.

Animate Scale

In this example ([Figure 12](#)), Animate Scale resizes a shape (between the specified maximum and minimum scale values) repeatedly every 2 seconds based on the present value of a cooling tower status point. For example, if the cooling tower is On, the animation starts. If the cooling tower is Off, the animation stops.

Figure 12: Animate Scale Dynamic Feature Configuration

1. In the **Action Codes** box, click **Animate Scale**.
2. Select the maximum and minimum levels of scaling (range = 0-1,000) for the shape's x-axis and y-axis in the **Maximum ScaleX**, **Minimum ScaleX**, **Maximum ScaleY**, and **Minimum ScaleY** menus.

Note: Click the **Preview** buttons and look at the drawing in Visio software to see how the scaling appears for the maximum and minimum selections. For example, if you select 2 for the maximum scale for the x-axis and y-axis, the shape appears double its original size in the drawing. The Preview button changes to Restore after you click it. Click **Restore** to return the shape to its original size.

3. Click the amount of time in seconds that you want the animation to occur on the **Duration** menu. The duration time is spanned equally between the specified minimum and maximum scaling limits.
4. Type a logic function expression in the **Begin Animation Expression** text box or click **Expression** to use the Expression Builder. For more information, see [Table 8](#) and the [Using the Expression Builder](#) section.

Custom Actions

In this example ([Figure 13](#)), a timer update function is created to set the current date and time equal to a local variable called **the_time**.

Figure 13: Custom Actions Dynamic Feature Configuration

Custom Actions

User Logic

```
var timer_update = function() { var c_time = new Date();
setlv('the_time', c_time.toLocaleString());
window.setInterval(timer_update, 1000); }
```

Expression

Action Codes: Custom Actions

1. In the **Action Codes** box, click **Custom Actions**.
2. Type JavaScript code in the **User Logic** text box or click **Expression** to use the Expression Builder. For more information, see the [Using the Expression Builder](#) section.

Note: AGA does not check syntax, so be sure that the JavaScript code you enter is correct. If it contains errors, an exception occurs and appears in the Java console when the graphic is executed at runtime. For background information on JavaScript, consult a reference book, such as *JavaScript: The Definitive Guide, Fifth Edition* by David Flanagan.

Discrete Color

In this example ([Figure 14](#)), Discrete Color switches the color of a shape based on the current status of a zone temperature as follows: Normal (0) is white; Low Warning (10) or High Warning (15) is Yellow; Low Alarm (30) or High Alarm (34) is Red.

Figure 14: Discrete Color Dynamic Feature Configuration

Discrete Color

Numeric Value: 1

Apply To: fill

Color Selection Expression (Numeric): biv(ADS1:NAE1/N2-1.AHU4.ZN-T.512), me;

Insert Color: [Red Square]

Number	Color
0	White
10	Yellow
15	Yellow
30	Red
34	Red

Add, Update, Remove

Expression

Action Codes: Discrete Color

1. In the **Action Codes** box, click **Discrete Color**.
2. Click in the **Insert Color** box. The Color selection dialog box appears.
3. Select a color and click **OK**. The color appears in the Insert Color box.
4. Type a numeric value for the Insert Color option in the **Numeric Value** text box.

- Click **Add** to assign the data to the color. The Number/Color table displays the option.

Note: Click **Update** to make changes or click **Remove** to delete a Number/Color pair.

- Follow Step 2 through Step 5 to assign numeric values to each additional color you want to display. The following steps apply to the shape as a whole.
- Click **fill** or **stroke** in the **Apply To** box.

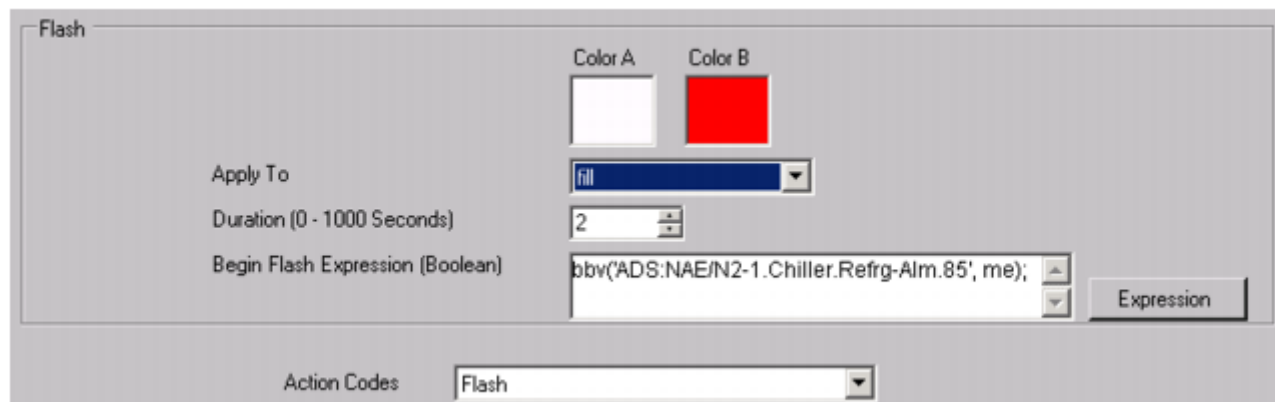
Note: Click **stroke** for the outline color of the shape, or click **fill** for the fill color of the shape.

- Type a numeric expression in the **Color Selection Expression** text box or click **Expression** to use the Expression Builder. For more information, see the [Using the Expression Builder](#) section.

Flash

In this example ([Figure 15](#)), Flash makes a shape appear to flash between white and red repeatedly every 2 seconds based on the value of a refrigeration alarm.

Figure 15: Flash Dynamic Feature Configuration

The image shows a dialog box titled "Flash". It contains several fields and controls. At the top right, there are two color selection boxes labeled "Color A" and "Color B". "Color A" shows a white swatch, and "Color B" shows a red swatch. Below these is a dropdown menu labeled "Apply To" with "fill" selected. Underneath is a numeric field for "Duration (0 - 1000 Seconds)" with the value "2". Below that is a text field for "Begin Flash Expression (Boolean)" containing the expression "bbv('ADS:NAE/N2-1.Chiller.Refrg-Alm.85', me);". To the right of this field is a button labeled "Expression". At the bottom, there is a dropdown menu for "Action Codes" with "Flash" selected.

- In the **Action Codes** box, click **Flash**.
- Click in the Color A box. The Color selection dialog box appears.
- Select a color and click **OK**. The color appears in the Color A box.
- Click in the Color B box. The Color selection dialog box appears.
- Select a color and click **OK**. The color appears in the Color B box.
- Click **fill** or **stroke** in the **Apply To** box.

Note: Select **stroke** for the outline color of the shape, or select **fill** for the fill color of the shape.

- Select the amount of time in seconds that you want the animation to occur in the **Duration** box. Duration is the time between each color change while flashing is occurring.
- Type an expression in the **Begin Flash Expression** text box or click **Expression** to use the Expression Builder. For more information, see the [Using the Expression Builder](#) section. The flashing begins when the expression evaluates to True and stops when the expression becomes False.

Hide

In this example ([Figure 16](#)), Hide causes an image to disappear if the specified expression evaluates to True.

Figure 16: Hide Dynamic Feature Configuration

The screenshot shows a dialog box titled "Hide". Inside, there is a label "Hiding Expression (Boolean: True = Hidden)" followed by a text input field containing the expression `bbv('ADS:NAE/AHU-1.CHLR-RTN.85',me);`. To the right of the text field is a button labeled "Expression". At the bottom of the dialog, there is a label "Action Codes" followed by a dropdown menu currently showing "Hide".

1. In the **Action Codes** box, click **Hide**.
2. Type an expression in the **Hiding Expression** text box or click **Expression** to use the Expression Builder. For more information, see the [Using the Expression Builder](#) section.

Hyper Link

In this example ([Figure 17](#)), Hyper Link tells the browser to open a new window and display the Johnson Controls® company website (<http://www.johnsoncontrols.com>) when the user clicks the shape that is assigned this action code.

Figure 17: Hyper Link Dynamic Feature Configuration

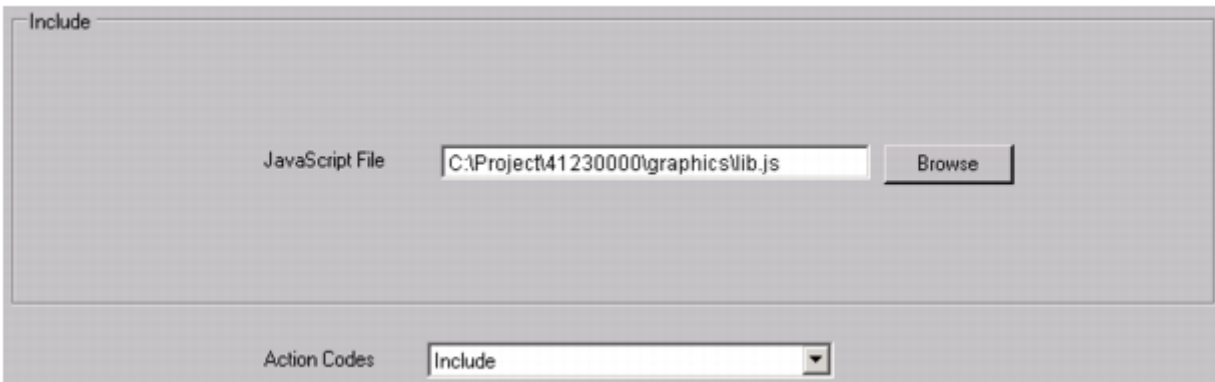
The screenshot shows a dialog box titled "Hyper Link". Inside, there are two text input fields. The first is labeled "Target Window" and contains the text "new". The second is labeled "URL" and contains the text "http://www.jci.com". At the bottom of the dialog, there is a label "Action Codes" followed by a dropdown menu currently showing "Hyper Link".

1. In the **Action Codes** box, click **Hyper Link**.
2. Type the target in the **Target Window** text box. For example, typing the word **new** in the Target Window text box opens the link in a new window.
3. Type the URL in the **URL** text box, including the **http://** prefix. The new window opens and displays the specified website when the shape is clicked during runtime.

Include

In this example ([Figure 18](#)), the specified Include (JavaScript) file executes the script on the graphic selected. For example, if you create a JavaScript file to display time and include the file with a text box, when the graphic appears in the Site Management Portal UI, the time appears in the text box.

Figure 18: Include Dynamic Feature Configuration

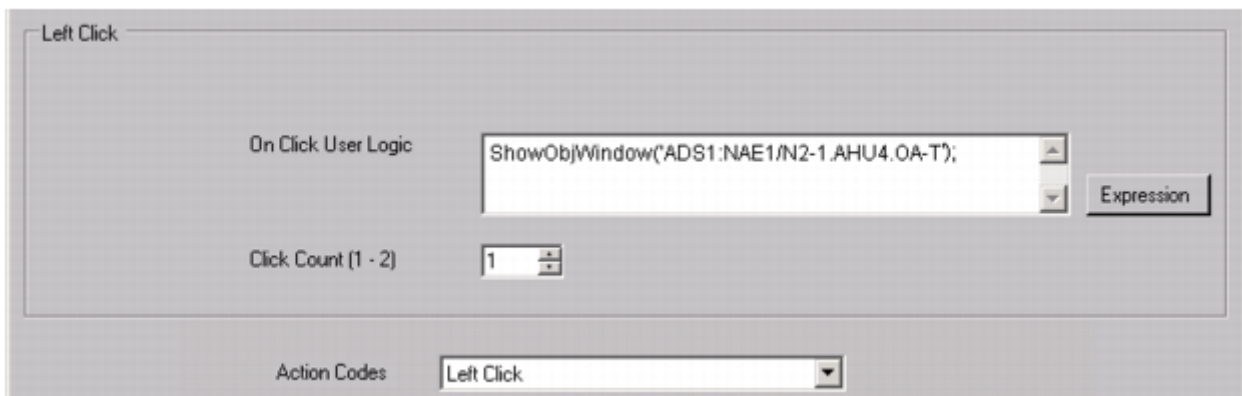


1. In the **Action Codes** box, click **Include**.
2. Type the path for the JavaScript file in the **JavaScript File** text box or click **Browse** to navigate to and select the file.

Left Click

In this example ([Figure 19](#)), the Focus window for the OA-T object appears when you click the shape once.

Figure 19: Left Click User Action Configuration

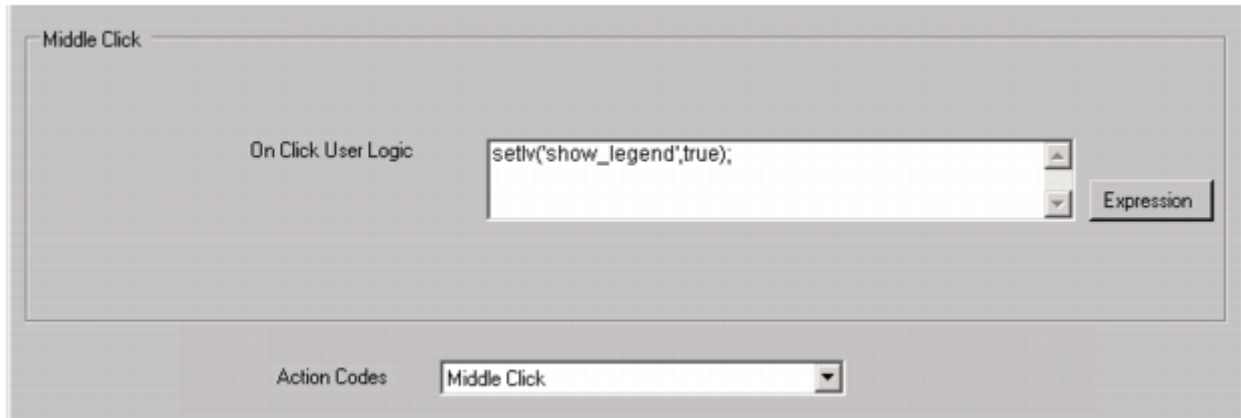


1. In the **Action Codes** box, click **Left Click**.
2. Type a logic function script in the **On Click User Logic** text box or click **Expression** to use the Expression Builder. For more information, see [Table 8](#) and the [Using the Expression Builder](#) section.
3. Select the number of times (1 = single click and 2 = double click) that the user must left-click the shape before the logic function script executes from the **Click Count** menu.

Middle Click

In this example ([Figure 20](#)), the show_legend variable is set to True when you click the middle mouse button on a three-button mouse.

Figure 20: Middle Click User Action Configuration



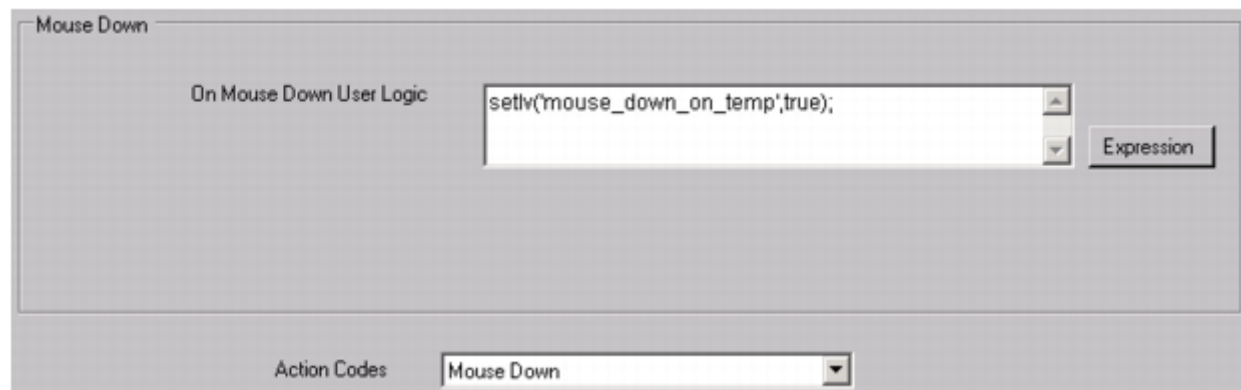
The screenshot shows a dialog box titled "Middle Click". Inside, there is a section labeled "On Click User Logic" with a text box containing the code `setlv('show_legend',true);`. To the right of the text box is a button labeled "Expression". Below this section is a dropdown menu labeled "Action Codes" with "Middle Click" selected.

1. In the **Action Codes** box, click **Middle Click**.
2. Type a logic function script in the **On Click User Logic** text box or click **Expression** to use the Expression Builder. For more information, see [Table 8](#) and the [Using the Expression Builder](#) section.

Mouse Down

In this example ([Figure 21](#)), the mouse_down_on_temp variable is set to True when you click the mouse button.

Figure 21: Mouse Down User Action Configuration



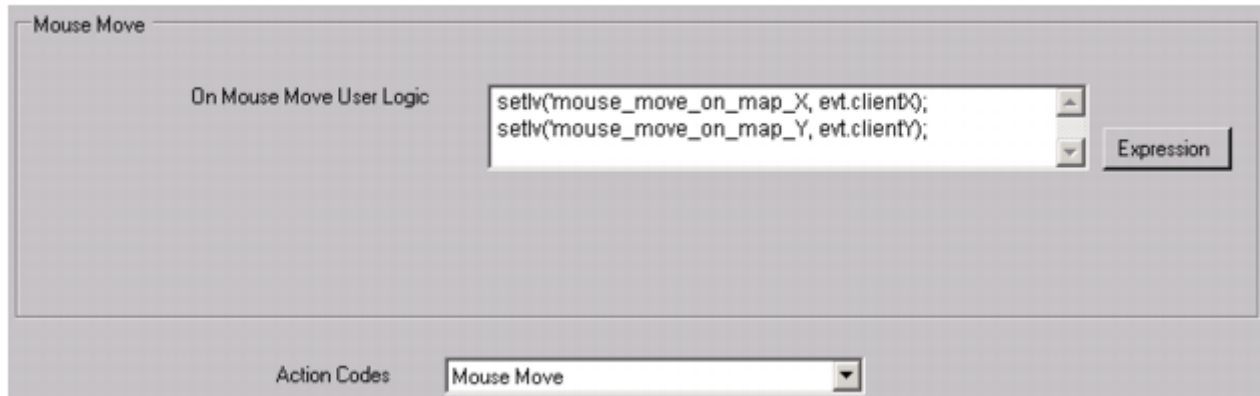
The screenshot shows a dialog box titled "Mouse Down". Inside, there is a section labeled "On Mouse Down User Logic" with a text box containing the code `setlv('mouse_down_on_temp',true);`. To the right of the text box is a button labeled "Expression". Below this section is a dropdown menu labeled "Action Codes" with "Mouse Down" selected.

1. In the **Action Codes** box, click **Mouse Down**.
2. Type a logic function expression in the **On Mouse Down User Logic** text box or click **Expression** to use the Expression Builder. For more information, see [Table 8](#) and the [Using the Expression Builder](#) section.

Mouse Move

In this example ([Figure 22](#)), two variables are set to the X and Y screen positions of the mouse whenever you move the mouse.

Figure 22: Mouse Move User Action Configuration

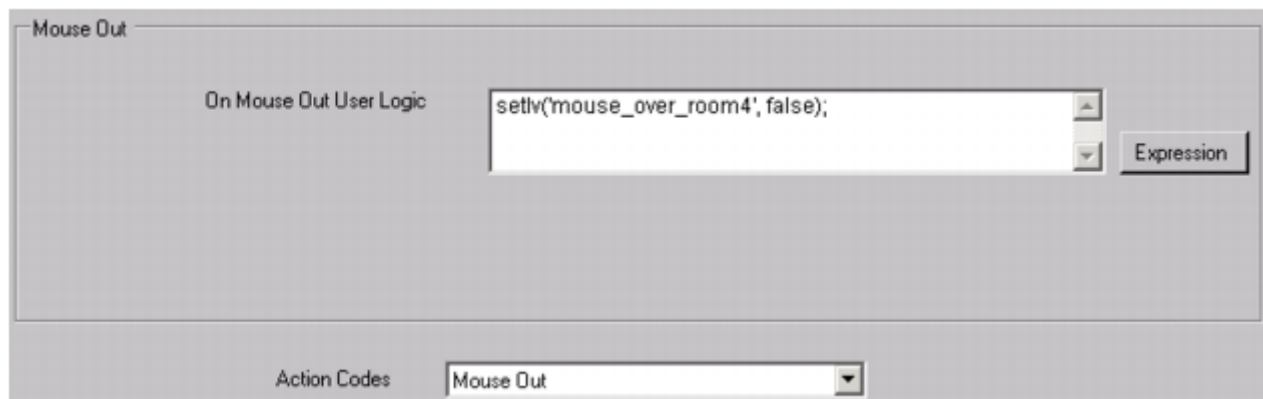


1. In the **Action Codes** menu, click **Mouse Move**.
2. Type a logic function expression in the **On Mouse Move User Logic** text box or click **Expression** to use the Expression Builder. For more information, see [Table 8](#) and the [Using the Expression Builder](#) section.

Mouse Out

In this example ([Figure 23](#)), a variable is set whenever you move the mouse off a shape.

Figure 23: Mouse Out User Action Configuration



1. In the **Action Codes** box, click **Mouse Out**.
2. Type a logic function expression in the **On Mouse Out User Logic** text box or click **Expression** to use the Expression Builder. For more information, see [Table 8](#) and the [Using the Expression Builder](#) section.

Mouse Over

In this example ([Figure 24](#)), a variable is set whenever you move the mouse over a shape.

Figure 24: Mouse Over User Action Configuration

The screenshot shows a dialog box titled "Mouse Over". Inside, there is a section labeled "On Mouse Over User Logic" which contains a text input field with the code `setlv('mouse_over_room4', true);`. To the right of this field is a button labeled "Expression". At the bottom of the dialog, there is a section labeled "Action Codes" with a dropdown menu currently set to "Mouse Over".

1. In the **Action Codes** box, click **Mouse Over**.
2. Type a logic function expression in the **On Mouse Over User Logic** text box or click **Expression** to use the Expression Builder. For more information, see [Table 8](#) and the [Using the Expression Builder](#) section.

Mouse Up

In this example ([Figure 25](#)), a variable is set whenever you release the mouse button.

Figure 25: Mouse Up User Action Configuration

The screenshot shows a dialog box titled "Mouse Up". Inside, there is a section labeled "On Mouse Up User Logic" which contains a text input field with the code `setlv('mouse_down_on_temp', false);`. To the right of this field is a button labeled "Expression". At the bottom of the dialog, there is a section labeled "Action Codes" with a dropdown menu currently set to "Mouse Up".

1. In the **Action Codes** box, click **Mouse Up**.
2. Type a logic function expression in the **On Mouse Up User Logic** text box or click **Expression** to use the Expression Builder. For more information, see [Table 8](#) and the [Using the Expression Builder](#) section.

Move

In this example ([Figure 26](#)), a shape is moved a certain percentage based on the present value of a zone setpoint.

Figure 26: Move Dynamic Feature Configuration

Move

Move Percentage Expression (Numeric: 0 - 100)

Action Codes:

1. In the **Action Codes** box, click **Move**.
2. Type a numeric expression in the **Move Percentage Expression** text box or click **Expression** to use the Expression Builder. For more information, see the [Using the Expression Builder](#) section.
3. In the Visio drawing, move the shape's control handle (the small yellow diamond) to the location to which you want the shape to move when the value of the object is 100. When the value of the object is 0, it moves to its pasted-down position. When the value of the object is between 0 and 100, the shape moves in a straight line proportional to the 0 and 100 positions. For example, a value of 50 moves the shape halfway between position 0 and position 100.

Navigate

In this example ([Figure 27](#)), a shape is assigned to navigate to the VAV graphic when you click it. Two local variables with values are also passed into the opened graphic.

Figure 27: Navigate Dynamic Feature Configuration

Navigate

Graphic Object Reference

Window Title

Local Variable

Local Value

Local Variable	Local Value
VAV	ADS:NAE/N2-1.VAV2
AHU	ADS:NAE/N2-2.AHU4

Action Codes:

1. In the **Action Codes** box, click **Navigate**.
2. Type a valid reference in the **Graphic Object Reference** text box.

Note: Alternatively, use the AGA Binder to obtain a valid Graphic Object Reference and paste it into this field. See the [Using the AGA Binder](#) section for information on how to use the AGA Binder.

3. Type a name for the window of the referenced graphic in the **Window Title** text box.

Note: If this name is already assigned to an existing window, the existing window is replaced by the new window. If the word new is entered in the Window Title text box, a new window specified by the graphic reference appears while the existing window remains open. If no name is entered, the window containing the Navigate action is replaced.

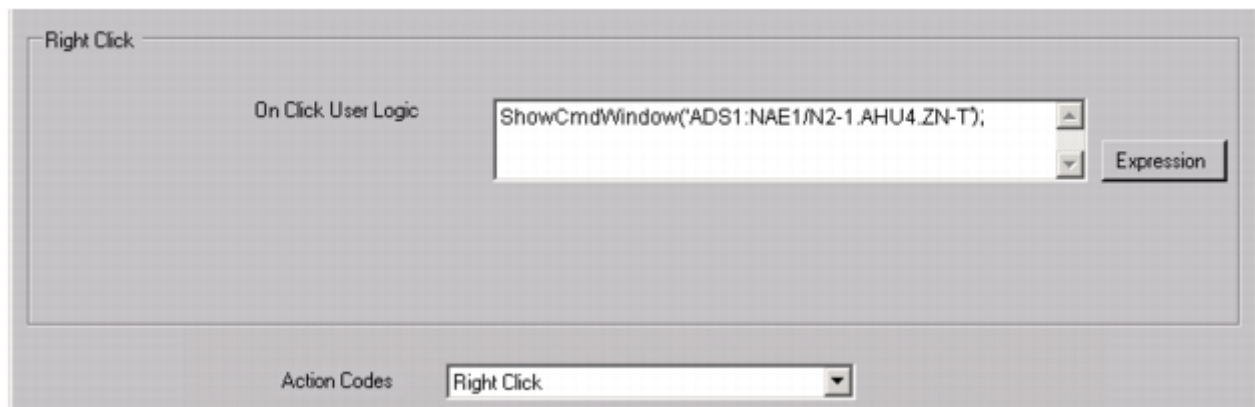
4. Type a local variable name in the **Local Variable** text box.
5. Type a value in the **Local Value** text box.
6. Click **Add** to assign the value to the variable. The Local Variable/Local Value table displays the option.

Note: Click **Update** to make changes or **click** Remove to delete a Local Variable/Local Value pair.

Right Click

In this example ([Figure 28](#)), the Command window for the ZN-T object displays when you right-click the shape.

Figure 28: Right Click User Action Configuration



To configure the Right Click Action Code:

1. In the **Action Codes** box, click **Right Click**.
2. Type a logic function script in the **On Click User Logic** text box or click **Expression** to use the Expression Builder. For more information, see [Table 8](#) and the [Using the Expression Builder](#) section.

Rotate

In this example ([Figure 29](#)), a shape rotates between 0 and 360 degrees based on the present value of the Volts-A object.

Figure 29: Rotate Dynamic Feature Configuration

The screenshot shows the 'Rotate' dialog box. It has a title bar 'Rotate'. Inside, there is a label 'Rotation Angle Expression (Numeric: 0 - 360)' followed by a text box containing the formula $360 * (4160 - \text{bfv}('ADS:NAE/N2-1.Chiller.Volts-A.85', \text{me})) / (4160)$. To the right of the text box is an 'Expression' button. At the bottom, there is an 'Action Codes' dropdown menu with 'Rotate' selected.

1. In the **Action Codes** box, click **Rotate**.
2. Type a numeric expression in the **Rotation Angle Expression** text box or click **Expression** to use the Expression Builder. For more information, see the [Using the Expression Builder](#) section.
3. In the Visio drawing, move the shape's center of rotation pin to a location. Rotation occurs clockwise around the center of the rotation pin, where the four major rotation points are 0, 90, 180, 270, and 360. For example, if the value is 90, the shape rotates clockwise 90 degrees from the rotation pin.

Scale

In this example ([Figure 30](#)), a shape is scaled on the x- and y-axis based on the present value of the Water-Level object.

Figure 30: Scale Dynamic Feature Configuration

The screenshot shows the 'Scale' dialog box. It has a title bar 'Scale'. Inside, there are three input fields: 'Scale X (0 - 1000)' with a value of 2, 'Scale Y (0 - 1000)' with a value of 1, and 'Percent Scale Expression (Numeric: 0 - 100)' with the formula $\text{bfv}('ADS:NAE/N2-1.Plant.Water-Level.85', \text{me}) / 10$. To the right of the first two fields is a 'Preview' button. To the right of the third field is an 'Expression' button. At the bottom, there is an 'Action Codes' dropdown menu with 'Scale' selected.

1. In the **Action Codes** box, click **Scale**.
2. Select a value for **Scale X** and **Scale Y** indicating the levels of scaling for the x-axis and y-axis. The scale number is a percentage, in which 0 is a reduction of 100% of original size along the x- or y-axis, 1 is no increase in size, 2 is an increase of 100% of original size (double), 3 is a 200% increase (triple), and so forth.

Note: Click **Preview** and look at the drawing in Visio software to see how the scaling appears for the selection. For example, if you select 2 for the scale for the x-axis and y-axis, the shape appears double its original size in the drawing. The Preview button changes to Restore after you click it. Click **Restore** to return the shape to its original size. The Preview operation has no effect on the saved drawing.

3. Type a numeric expression in the **Percent Scale Expression** text box or click **Expression** to use the Expression Builder. For more information, see the [Using the Expression Builder](#) section

Set Fill

In this example ([Figure 31](#)), a shape is specified to fill in with the color Red.

Figure 31: Set Fill Dynamic Feature Configuration

1. In the **Action Codes** box, click **Set Fill**.
2. Type an expression in the **User Logic** text box. The name of the color or hex equivalent must be surrounded by single quotes ([Figure 31](#)). Alternatively, you can click **Expression** to use the Select Color option in the Expression Builder. For more information, see the [Using the Expression Builder](#) section.

Sound

In this example ([Figure 32](#)), a sound file called ding.wav is specified to play once when the sound expression evaluates to True.

Figure 32: Sound Dynamic Feature Configuration

To configure the Sound Action Code:

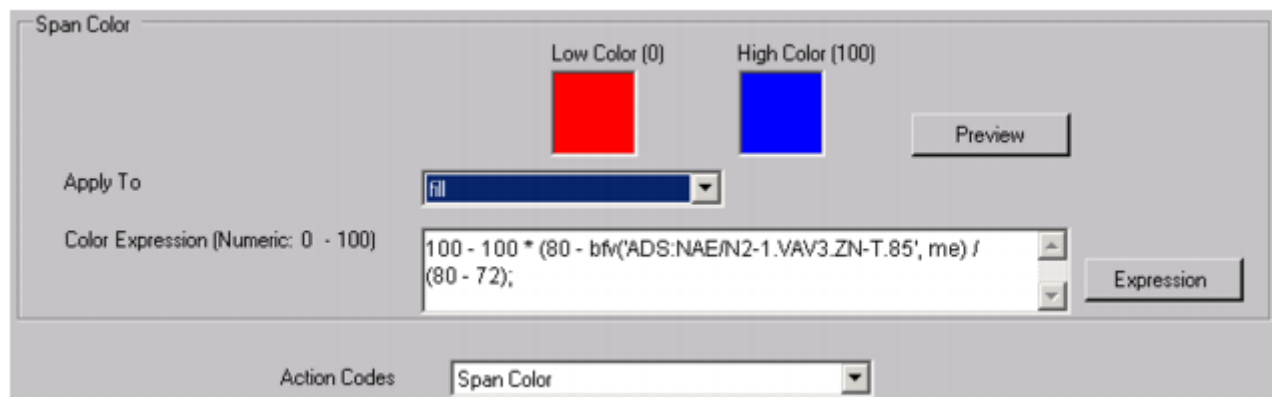
1. In the **Action Codes** box, click **Sound**.

2. Type the path of the sound file in the **File Name** text box or click **Browse** to navigate to and select the file.
3. Select the number of times the sound file should repeat from the **Repeat Count** menu or click in the box to select **Indefinite** to repeat the sound continuously.
4. Type an expression in the **Begin Playing Sound Expression** text box or click **Expression** to use the Expression Builder. For more information, see the [Using the Expression Builder](#) section.

Span Color

In this example ([Figure 33](#)), a shape is specified to span between the colors Red (0) and Blue (100) based on the present value of the ZN-T object.

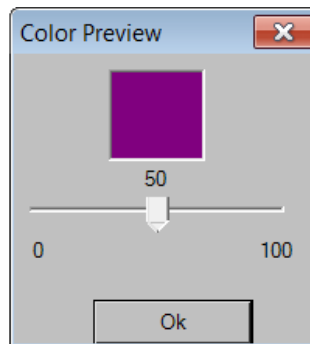
Figure 33: Span Color Dynamic Feature Configuration



To configure the Span Color Action Code:

1. In the **Action Codes** box, click **Span Color**.
2. Click in the **Low Color** box. The Color selection dialog box appears.
3. Select a color for the lower limit and click **OK**. The color appears in the Low Color box.
Note: The Low Color Limit value is 0, and colors with values lower than 0 automatically take on the value 0.
4. Click in the **High Color** box. The Color selection dialog box appears.
5. Select a color for the higher limit and click **OK**. The color appears in the High Color box.
Note: The High Color Limit value is 100, and colors with values greater than 100 automatically take on the value 100.
6. Click stroke or fill in the **Apply To** box.
Note: Click **stroke** for the outline color of the shape, or click **fill** for the fill color of the shape.
Note: Click **Preview** to display the Color Preview dialog box ([Figure 34](#)). With this dialog box opened, use the slider bar to show how the color gradient changes between the Low Color and High Color selections. For example, if you selected red for the Low Color and blue for the High Color, the color appears purple halfway between red and blue (50 on the preview bar). Click **Ok** to exit the preview.

Figure 34: Color Preview Dialog Box

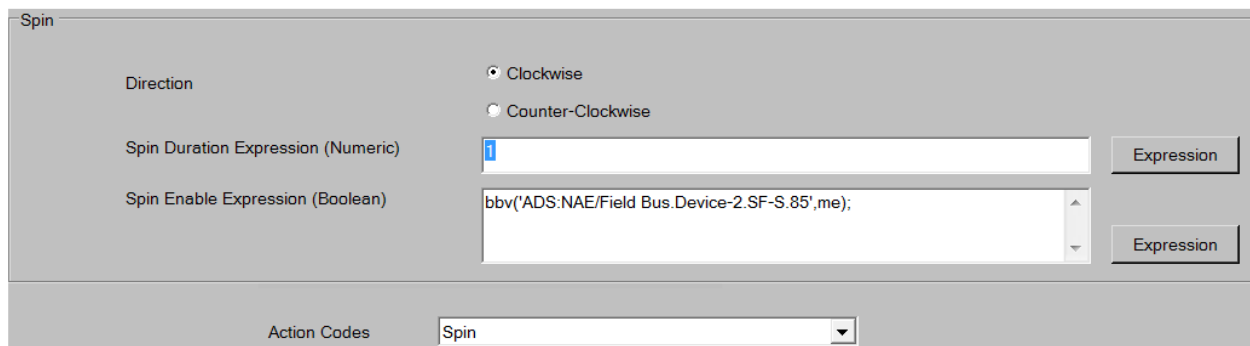


7. Type an expression in the **Color Expression** text box or click **Expression** to use the Expression Builder. For more information, see the [Using the Expression Builder](#) section.

Spin

In this example ([Figure 35](#)), a shape is specified to spin clockwise when the present value of the SF-S object is On for a duration of one revolution per second, and to stop spinning when the object is Off.

Figure 35: Spin Dynamic Feature Configuration



1. In the **Action Codes** box, click **Spin**.
2. Click **Clockwise** or **Counter-Clockwise** as the **Direction** to spin the shape.
3. Type an expression or integer in the **Spin Duration Expression** text box or click **Expression** to use the Expression Builder. A value of 1 defines a spin rate of approximately one revolution per second; 2 is one revolution every 2 seconds, 3 is one revolution every 3 seconds, and so forth. For more information on expressions, see the [Using the Expression Builder](#) section.
4. Type an expression in the **Spin Enable Expression** text box or click **Expression** to use the Expression Builder. For more information, see the [Using the Expression Builder](#) section.

SVG Tag Attribute

In this example ([Figure 36](#)), the SVG tag attribute Opacity is set to 0.0.

Figure 36: SVG Tag Attribute

The screenshot shows a dialog box titled "SVG Tag Attribute". It contains two text input fields: "Name" with the value "opacity" and "Value" with the value "0.0". At the bottom, there is a dropdown menu labeled "Action Codes" which is currently set to "SVG Tag Attribute".

1. In the **Action Codes** box, click **SVG Tag Attribute**.
2. Type the name of the attribute in the **Name** text box.
3. Type a value for the attribute in the **Value** text box.

Text

In this example ([Figure 37](#)), the string value of the ZN-T object is displayed for the text object inside the shape.

Figure 37: Text Dynamic Feature Configuration

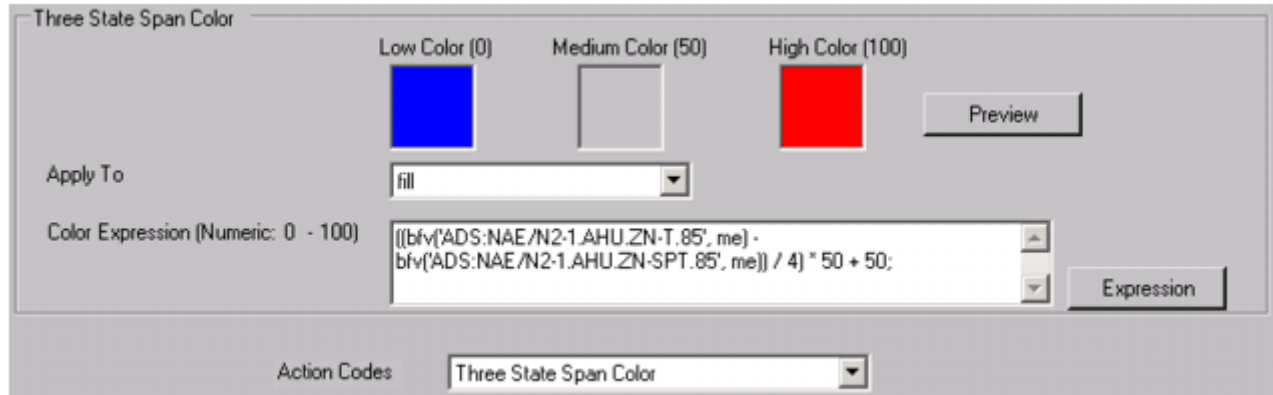
The screenshot shows a dialog box titled "Text". It features a large text input field labeled "Text Expression (String)" containing the expression `bsv('ADS:NAE/N2-1.AHU-1.ZN-T.85', me);`. To the right of this field is a button labeled "Expression". At the bottom, there is a dropdown menu labeled "Action Codes" which is set to "Text".

1. In the **Action Codes** box, click **Text**.
2. Type an expression in the **Text Expression** text box or click **Expression** to use the Expression Builder. For more information, see [Table 8](#) and the [Using the Expression Builder](#) section.

Three State Span Color

In this example ([Figure 38](#)), a shape is specified to span between the colors Blue (0), Gray (50), and Red (100) based on the present values of a monitored room temperature (ZN-T) and its setpoint (ZN-SPT). When the temperature is 4 degrees below setpoint, the color is blue; when the temperature is 4 degrees above setpoint, the color is red.

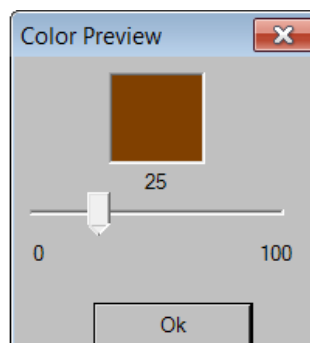
Figure 38: Three State Span Color Dynamic Feature Configuration



To configure the Three State Span Color Action Code:

1. In the **Action Codes** box, click **Three State Span Color**.
2. Click in the **Low Color** box. The Color selection dialog box appears.
3. Select a color for the lower limit and click **OK**. The color appears in the Low Color box.
Note: The Low Color Limit value is 0, and colors with values lower than 0 automatically take on the value 0.
4. Click in the **Medium Color** box. The Color selection dialog box appears.
5. Select a color for the medium value and click **OK**. The color appears in the Medium Color box.
6. Click in the **High Color** box. The Color selection dialog box appears.
7. Select a color for the higher limit and click **OK**. The color appears in the High Color box.
Note: The High Color Limit value is 100, and colors with values greater than 100 automatically take on the value 100.
8. Click **stroke** or **fill** in the **Apply To** box.
Note: Click **stroke** for the outline color of the shape, or click **fill** for the fill color of the shape.
Note: Click **Preview** to display the Color Preview dialog box (Figure 39). With this dialog box opened, use the slider bar to show how the color gradient changes between the Low, Medium, and High Color selections. For example, if you selected red for the Low Color and green for the Medium Color, the color appears brown halfway between red and green (25 on the preview bar). Click **Ok** to exit the preview.

Figure 39: Color Preview Dialog Box

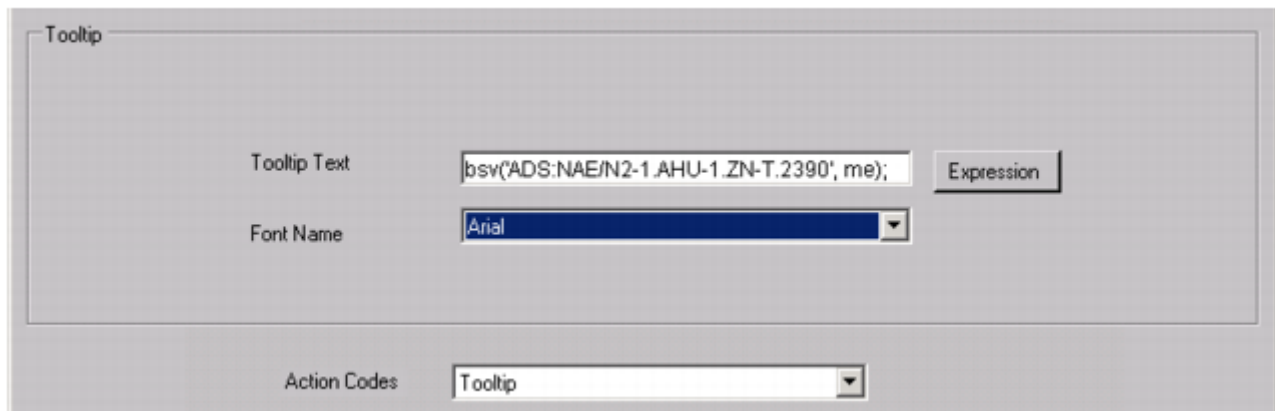


9. Type an expression in the **Color Expression** text box or click **Expression** to use the Expression Builder. For more information, see the [Using the Expression Builder](#) section.

Tooltip

In this example ([Figure 40](#)), a shape displays a tooltip box displaying the name of the ZN-T object in the Arial font. We recommend that you select the Arial font, since this is a popular font present on most computers, and any unusual fonts might not be available on the client computer.

Figure 40: Tooltip Dynamic Feature Configuration



The screenshot shows a dialog box titled "Tooltip". It contains the following fields and controls:

- Tooltip Text:** A text box containing the expression `bsv(ADS:NAE/N2-1.AHU-1.ZN-T.2390', me);`. To the right of this text box is a button labeled "Expression".
- Font Name:** A dropdown menu with "Arial" selected.
- Action Codes:** A dropdown menu at the bottom with "Tooltip" selected.

1. In the **Action Codes** box, click **Tooltip**.
2. Type an expression in the **Tooltip Text** text box or click **Expression** to use the Expression Builder. For more information, see the [Using the Expression Builder](#) section.

Using the Expression Builder

Use the Expression Builder to add expressions when configuring the Action Codes used to animate shapes. For more information on the Expression Builder, see the [Expression Builder](#) section.

1. In the Action Code configuration section of the screen, click **Expression**. (For example, see the Expression button in [Tooltip](#).) The Expression Builder appears. See [Figure 3](#) and [Table 7](#).
2. Select a value or variable template option from the Read/Write bound values or Local variable menu. See [Table 8](#) for information on the logic function scripts.
3. Type the Object Reference or Local Variable in the Object Reference/Local Variable text box.
Note: Alternatively, you can click the Lookup button (ellipses) to launch the AGA Binder and build an expression. See the [Using the AGA Binder](#) section.
4. Click **Build**. The Expression Builder builds the expression and displays it in the Generated Expression text box.
Note: The Add Operator menu provides a list of commonly used logical operations to use in building logical expressions. To add on to the expression, select an operator from the Add Operator menu and repeat Steps 2 through 4.
Note: The NOT (!) and TERNARY (?) operators are also available for use by editing the generated expression.
5. Click OK.

Using the AGA Binder

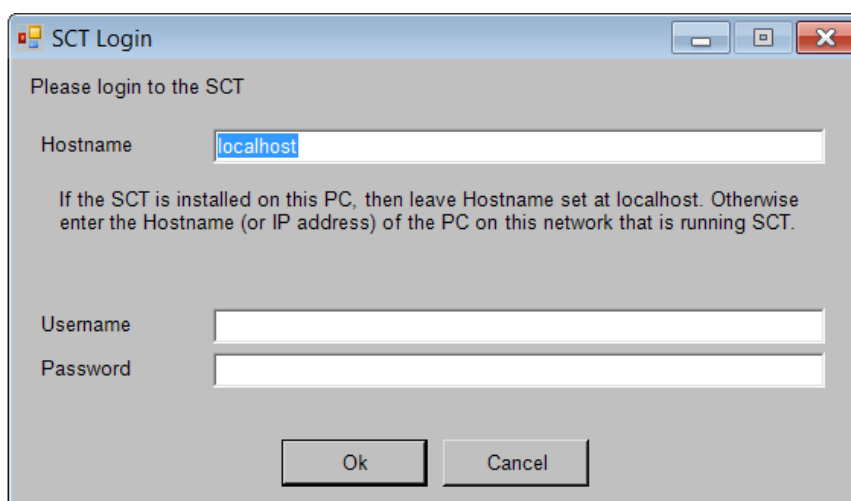
Use the AGA Binder to build an expression to bind data to a shape.

Important: To use the AGA Binder, the SCT must be accessible from the computer being used to create the advanced graphic.

Important: The NAE/NCE/NIE or ADS/ADX database must be uploaded to the SCT before you can use the AGA Binder to access points.

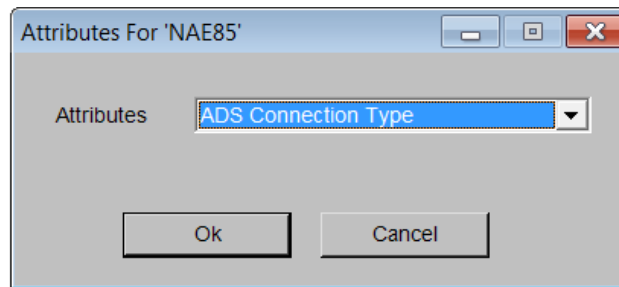
1. Click the graphics binding icon in the toolbar or select **Graphics Binding** from the Tools menu. The AGA Binder appears (see [Figure 4](#)).
Note: You can also launch the AGA Binder from the Expression Builder screen by clicking the **Lookup** button next to the Object Reference/Local Variable text box. [Figure 3](#) points out the Lookup button.
2. From the Actions menu, select **Login**. The SCT Login screen appears ([Figure 41](#)).

Figure 41: SCT Login Screen



3. Type the host name in the Hostname text box.
Note: If the SCT is installed on your computer, use **localhost** as the Hostname. If the SCT is on a server or different computer, type the IP address or host name of that machine.
4. Type your user name in the Username text box.
5. Type your password in the Password text box.
6. Click **OK**. If the host name, user name, and password you entered are correct, the AGA Binder logs in to the SCT, and data becomes available in the SCT Archives and References tabs of the AGA Binder. If the host name, user name, or password you entered is incorrect, an error message displays. Click **OK** and try logging in again.
7. Double-click an archive database. The Reference tab becomes active displaying data from the selected archive.
8. Navigate to and select an item or point to reference. [Figure 4](#) shows the AGA Binder with the References tab active and NAE-SIX selected with a single-click.
Single-clicking an item in the Reference tab's Navigation Tree copies the item's reference data into the Windows clipboard. Double-clicking an item launches the Attribute dialog box allowing you to select an attribute level reference. (If this Attribute dialog box does not appear, see [Troubleshooting](#).) Select the attribute from the drop-down list and click **OK** to copy the reference.

Figure 42: Attributes Dialog Box



Note: When you copy the attribute level reference, the attribute portion of the reference changes to the number assigned to it in the Attributes Set. For example, the Present Value attribute is designated as 85. To look up other attributes, refer to the *Metasys System Enumeration Sets Technical Bulletin (LIT-12011361)*.

Select an attribute level reference when editing shapes using action codes. When editing a shape using the Custom Properties dialog box (Visio 2003) or Shape Data (Visio 2007 and Visio 2010), do not select an attribute to reference.

9. Return to the Expression Builder or return to the main screen of the Advanced Graphics Application and display an Action Code in the top panel of the screen.
10. Right-click in the text box to add the reference and select **Paste**. The reference appears in the selected location.
11. For the Expression Builder, click **Build** to display the expression in the Generated Expression text box and click **Ok**.
12. To close the AGA Binder, select Exit from the AGA Binder's File menu.

Creating an Aliased Graphic

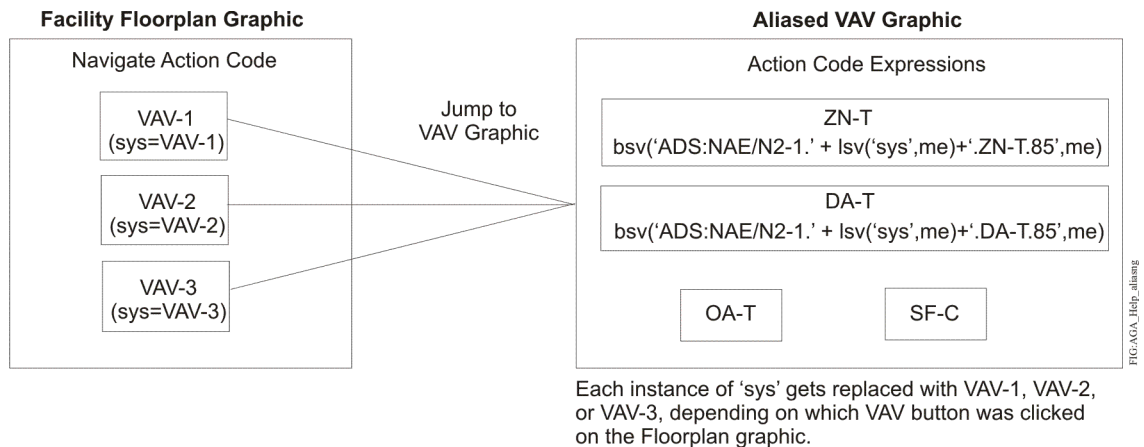
Use this example and [Figure 43](#) to guide you in creating aliased graphics. This example describes how to create a single graphic to use for all VAVs in a system. This method allows you to create one graphic normally and then create an alias to use for the other graphics. See the [Adding Action Codes to a Shape](#) section for details on adding action codes.

To create an aliased graphic (VAV example):

1. Create a general VAV graphic and bind data to a specific VAV controller normally.
2. Revisit each dynamic and perform the following tasks:
 - a. Highlight the portion of the object reference that represents the controller object (for example, highlight VAV-1 in 'ADS:NAE/N2-1.VAV-1.ZN-T.85').
 - b. Replace the highlighted portion with the following text:
' + lsv ('VAV', me) + '
where VAV is the name of the Local Variable to be defined in a Navigate action code that contains the substitute VAV controller name.
3. Create another graphic with a floor plan containing shapes configured to navigate to the VAV graphic.

For each navigation shape, use the Navigate action code to add a Local Variable named VAV with a Local Value that contains the name of the VAV controller at the navigation shape's location.

Figure 43: Aliased Graphic Example



Configuring Action Codes for a Return Fan Shape Example

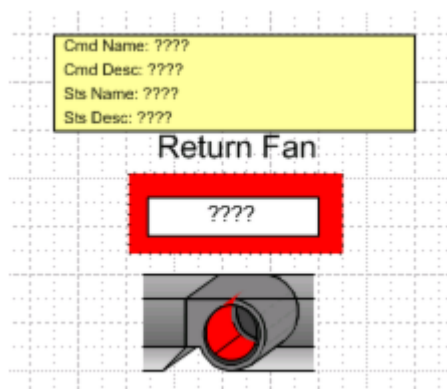
The following example shows how to configure the action codes of a Return Fan shape to change colors to indicate when the fan is on or off. Use this example as a guide in defining dynamics for your shapes. See the [Creating and Editing an Advanced Graphic \(Overview\)](#) section for information on the processes. See the [Graphics Example Stencil](#) section for a list of the Return Fan action codes.

In this example, the Hide, Mouse Over, and Mouse Out action codes do not require modification. The other action codes must be updated with valid object references.

To configure action codes for a Return Fan shape:

1. In the Professional or Standard edition of Microsoft Visio 2003, 2007, or 2010 software, open or create your graphic (Visio drawing in VSD format).
2. Add the Return Fan shape from the Graphics Example to a location in your graphic ([Figure 44](#)).

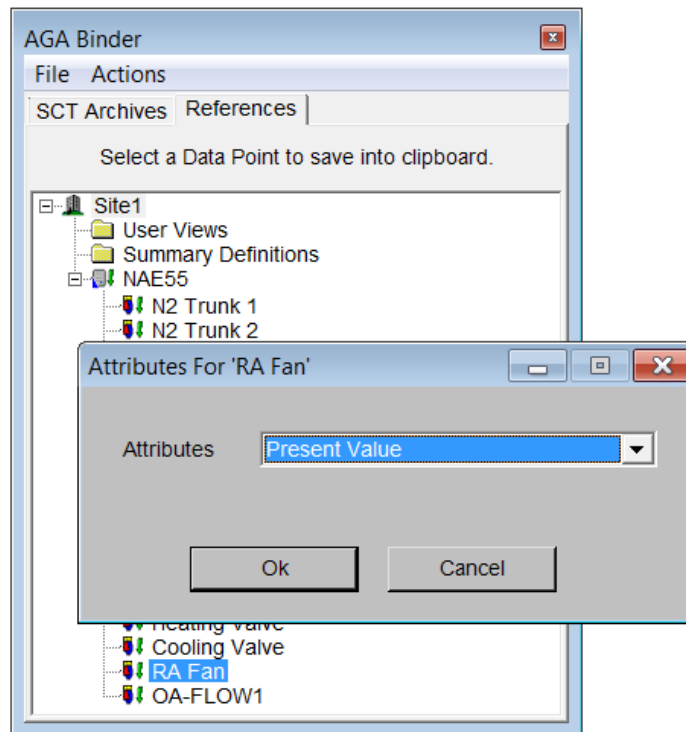
Figure 44: Return Fan Shape



3. Click just the red portion of the Return Fan shape and launch the Advanced Graphics Add-On Application. Notice that Span Color is selected in the Dynamic Features section.
4. Remove the Span Color selection.
5. Click **Discrete Color** in the Dynamic Features portion of the screen.

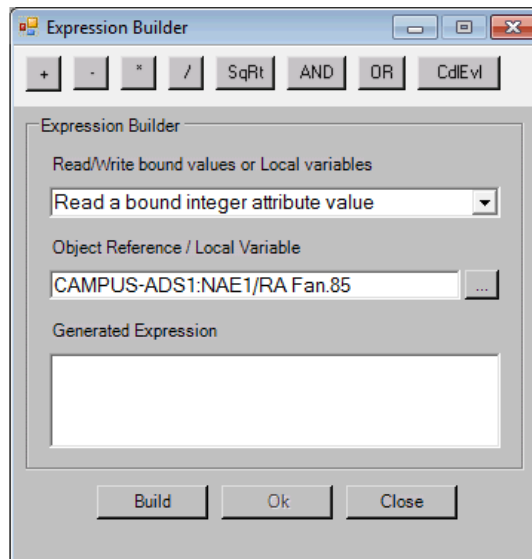
6. From the Action Codes menu, click **Discrete Color**. The Discrete Color action code configuration appears.
7. Follow the instructions in the [Discrete Color](#) section to add a red fill color (0) and a green fill color (1). The red indicates the fan is off and the green indicates the fan is on.
8. Click the **Expression** button. The Expression Builder appears. See the [Using the Expression Builder](#) section for details.
9. In the Read/Write bound values or Local variables menu, click **Read a bound integer attribute value**.
10. Click the **Lookup** button to launch the AGA Binder.
11. Follow the instructions in the [Using the AGA Binder](#) section to log in to the SCT and select the reference to the Present Value attribute of the RA Fan ([Figure 45](#)).

Figure 45: Return Fan Present Value Reference in AGA Binder



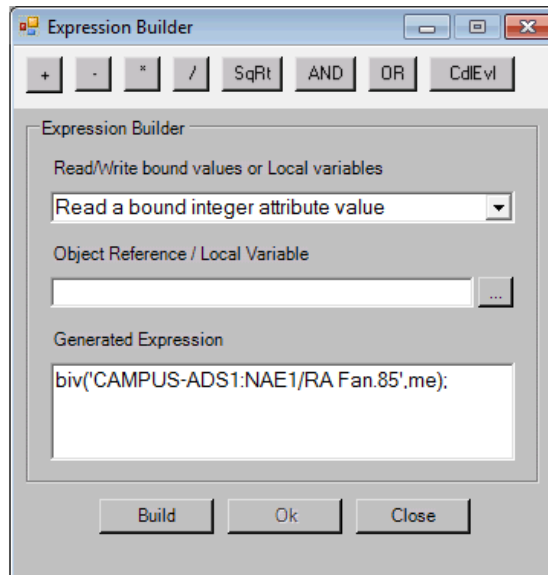
12. Return to the Expression Builder screen and paste the reference in the Object Reference/Local Variable text box ([Figure 46](#)).

Figure 46: Expression Builder Configuration



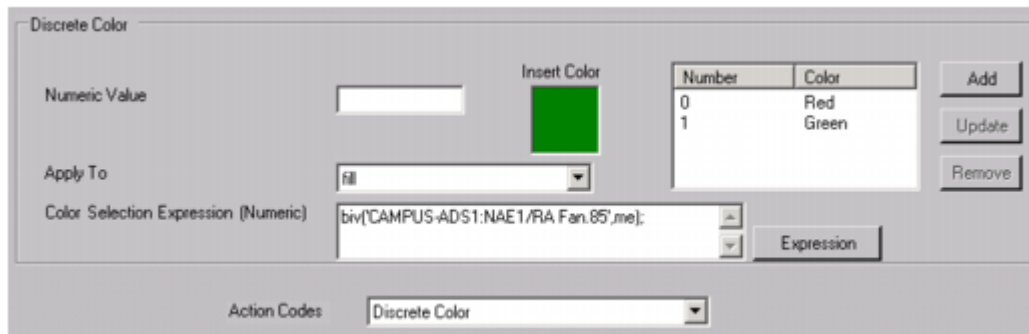
13. Click **Build**. The expression appears in the Generated Expression text box ([Figure 47](#)).

Figure 47: Expression Builder Configuration Complete



14. Click **OK**.
15. On the Advanced Graphics Add-On screen, notice the expression is inserted in the Color Selection Expression text box ([Figure 48](#)).

Figure 48: Discrete Color Configuration



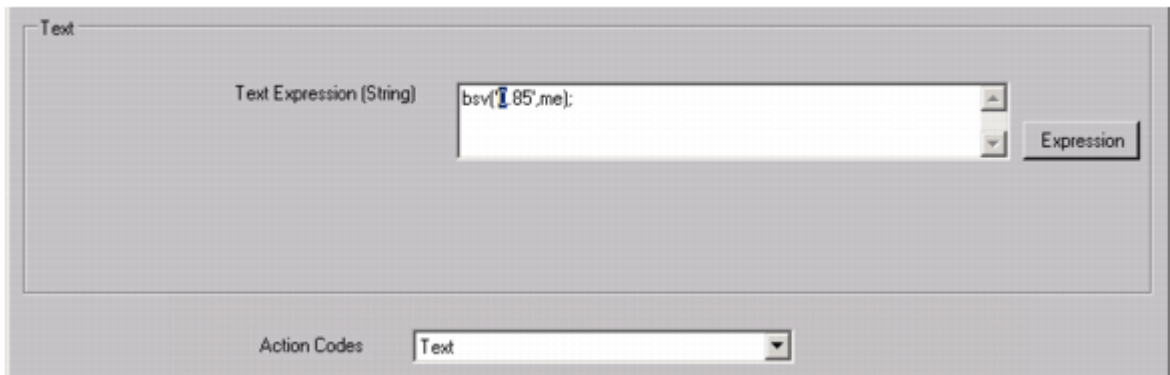
The Discrete Color Configuration dialog box contains the following elements:

- Numeric Value:** An empty text input field.
- Insert Color:** A green color swatch.
- Table:** A table with two columns: "Number" and "Color".

Number	Color
0	Red
1	Green
- Buttons:** "Add", "Update", and "Remove" buttons are located to the right of the table.
- Apply To:** A dropdown menu with "fill" selected.
- Color Selection Expression (Numeric):** A text input field containing the expression `biv('CAMPUS-AD51:NAE1/RA Fan.85',me);`.
- Expression:** A button next to the expression field.
- Action Codes:** A dropdown menu with "Discrete Color" selected.

16. Click **Apply Changes**.
17. In the Visio software File menu, click **Save Advanced Graphics** to save the changes to the graphic in the SVG or SVGZ file.
18. Click the text box below the Return Fan label and launch the Advanced Graphics Add-On Application. Notice that Text is selected in the Dynamic Features section.
19. In the Action Codes menu, select **Text**. The Text action code configuration appears with an expression already defined. You need to replace the 0 in the expression with an object reference ([Figure 49](#)).

Figure 49: Text Action Code - Return Fan Label Configuration



The Text Action Code configuration dialog box contains the following elements:

- Text Expression (String):** A text input field containing the expression `bsv('0.85',me);`.
- Expression:** A button next to the expression field.
- Action Codes:** A dropdown menu with "Text" selected.

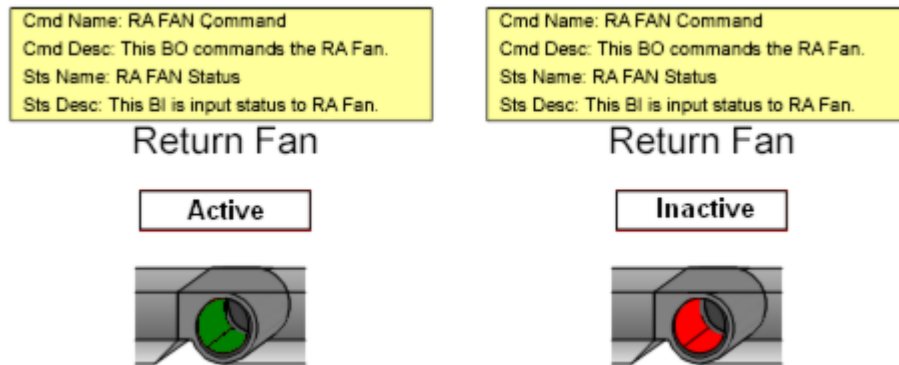
20. Click the **Lookup** button to launch the AGA Binder.
21. Follow the instructions in the [Using the Expression Builder](#) section to log in to the SCT and click the reference to the RA Fan.
22. Return to the Advanced Graphics Add-On screen, highlight the 0 in the existing expression, and paste the new reference in its place ([Figure 50](#)).

Figure 50: Text Action Code - Return Fan Label Configuration Complete

The screenshot shows a 'Text' configuration dialog box. The main area is labeled 'Text Expression (String)' and contains a text input field with the expression `bsv('CAMPUS-ADS1:NAE1/RA Fan.85',me);`. To the right of this field is a button labeled 'Expression'. At the bottom of the dialog, there is a section labeled 'Action Codes' with a dropdown menu that currently displays 'Text'.

23. Click **Apply Changes**.
24. In the Visio software File menu, select **Save Advanced Graphics** to save the changes to the graphic in the SVG or SVGZ file.
25. Repeat Steps 18 through 24 to add valid references to the remaining action codes. Cmd Name and Cmd Desc reference the command output object for the fan. Sts Name and Sts Desc reference the status input object for the fan. This example uses the following expressions for the remaining action codes:
 - **Text for Cmd Name** - 'Cmd Name: ' + bsv('CAMPUS-ADS1:NAE1/N2-1.AHU-1.RA Fan Command.2390', me);
 - **Text for Cmd Desc** - 'Cmd Desc: ' + bsv('CAMPUS-ADS1:NAE1/N2-1.AHU-1.RA Fan Command.28', me);
 - **Text for Sts Name** - 'Sts Name: ' + bsv('CAMPUS-ADS1:NAE1/N2-1.AHU-1.RA Fan Status.2390', me);
 - **Text for Sts Desc** - 'Sts Desc: ' + bsv('CAMPUS-ADS1:NAE1/N2-1.AHU-1.RA Fan Status.28', me);
 - **Left Click** - ShowObjWindow('CAMPUS-ADS1:NAE1/RA Fan');
 - **Right Click** - ShowCmdWindow('CAMPUS-ADS1:NAE1/RA Fan');
 - **Animate Hide** - (bsv('CAMPUS-ADS1:NAE1/RA Fan.512',me)=='High Alarm')?true:(bsv('CAMPUS-ADS1:NAE1/RA Fan.512',me)=='Low Alarm')?true:false
 - **Discrete Color for Present Value Text Box** - biv('CAMPUS-ADS1:NAE1/RA Fan.85',me);
26. From the Visio software File menu, select **Save** to save the changes to the Visio drawing in VSD format.
27. Log in to the SMP UI or SCT UI.
28. Insert a graphic object into the SMP UI or SCT UI and import the advanced graphic. See the [Inserting an Advanced Graphic to the UGT](#) section.
29. View the graphic ([Figure 51](#)). Left-click the fan to display the RA Fan focus window. Right-click the fan to open the RA Fan command window. See the [Viewing a Graphic](#) section.

Figure 51: Return Fan On and Off



Inserting an Advanced Graphic to the UGT

Use this procedure to insert a graphic object into the User Graphics Tool and attach an advanced graphic file to the object using the Insert Graphic Wizard. In order to attach the graphic file, the file must be accessible, either locally or remotely via a mapped network drive. For more information on how to insert a Graphic object, refer to the *Wizards* section of the *Metasys SMP Help (LIT-1201793)*.

1. Log in to the SMP UI.
2. Select the location in the Navigation Tree where you want to store your graphic.
3. In the Insert menu, select **Graphic**. The Insert Graphic Wizard appears with the Destination screen open.
4. If you clicked the location for your graphic in Step 2, that location 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 Identifier screen appears.
5. Give the graphic a unique name and click **Next**. The Insert Graphic Wizard Configure screen appears.
6. Make sure the information on the Configure screen is correct and click **Next**. The Insert Graphic Wizard Summary screen appears.

Note: The Description and Object Category attributes are optional, but can be used to help you remember the purposes for the different graphics.

7. Make sure the information on the Summary screen is correct and click **Finish**.
8. In the Action menu in the SMP UI, click **Refresh** on all tabs to make sure that you can see your new graphic object in the navigation tree.
9. Double-click the graphic object to display it in the display panel.
10. On the Graphic tab, click **Edit**.
11. Click the **Set Advanced Image** button (🖼️). The Open dialog box appears.
12. Browse to and select the SVG or SVGZ file you want to attach to this Graphic object.
13. Click **Open**.
14. Click **Save** to insert the Graphic object into the database.
15. Go to the [Viewing a Graphic](#) section.

Viewing a Graphic

You view an advanced graphic in the SMP UI, not the Advanced Graphics Application.

1. Double-click the advanced graphic in the SMP UI (ADS/ADX/NAE/NCE). The advanced graphic opens in the user interface framework (see [Figure 8](#)). The advanced graphic retrieves object reference values from the associated devices, for example, the NAE/NCE or the ADS.
2. Monitor and command the system according to the graphic's configuration. For example, if a shape is configured to launch the Command window (using ShowCmdWindow), you can send a command to the referenced device. To zoom, use [Table 11](#).

Table 11: Zooming in an Advanced Graphic

Key Stroke/Mouse Action	Zoom Function
Ctrl + shift + right-click	Return to initial view.
Ctrl + right-click + drag the mouse	Rotate the image.
Ctrl + left-click + drag the mouse	Zoom to the zoom selection box.
Shift + right-click + drag the mouse	Start interactive zoom.
Shift + left-click + drag the mouse	Pan over the image.

See [Advanced Graphics Viewing](#).

Troubleshooting

[Table 12](#) lists possible problems and the warning messages that appear in the Advanced Graphics Application and describes their solutions.

Table 12: Troubleshooting and Warning Messages

Problem, Error, or Pop-Up Message	Solution
A shape dynamic does not work in the Adobe® SVG Viewer (runtime mode).	Occurs when there is an error in the action codes defined for that shape. Double-click the Java console icon. Look for the AGAException (shape ID) message. If this message appears, there is an error in the action codes for that shape. In the Professional or Standard edition of Microsoft Visio 2003, 2007, or 2010 software, select that shape. Launch the Advanced Graphics Application. Check the action codes for syntax errors and modify as needed.
Advanced graphics display slowly.	To improve performance, split up complex graphics into multiple graphics or redesign graphics to reduce complexity and remove unnecessary components.
Release 3.0 or later Advanced Graphics Application does not show Synchronized Multimedia Integration Language (SMIL) animation in my graphic.	Release 3.0 or later does not support SMIL animation. Release 3.0 or later Advanced Graphics Application supports only those SMIL functions that the Action Code Editor generates. If you add SMIL to your graphics, you may lose functionality in your advanced graphic.
You cannot create ActiveX® controls with the Release 3.0 or later Advanced Graphics Application.	Release 3.0 or later Advanced Graphics Application does not provide access to the entire suite of Windows Internet Explorer® Application Programming Interfaces (APIs), including those that allow you to create ActiveX controls.
[Action code name] is configured improperly. Do you want to delete the action codes? Click Yes to delete, Click No to deselect the shape	Appears while saving the SVG file and the specified action code is configured improperly. Click Yes to delete the action code or click No to remove the shape selection. Reconfigure the action code and save the file as an SVG.
An Application instance of Action Code AddOn is already running.	Appears when you attempt to launch the Advanced Graphics Application Add-On when the add-on is already running. Click OK and select the existing add-on screen.
[C:\Documents and Settings\hpd240\Desktop\all.svg] already exists. Do you want to replace it?	Appears when you attempt to save an advanced graphic with the same file name as an existing graphic. Click Yes to overwrite the existing file. Click No to save the file under a different name.

Table 12: Troubleshooting and Warning Messages

Problem, Error, or Pop-Up Message	Solution
Could not retrieve Attributes!	Appears when you select Actions > Show Attributes in the AGA Binder when the network is down, or when the computer with SCT is running a version of Microsoft SQL Server® with non-default or named instance. Make sure that the default <i>Metasys</i> user name MetasysSysAgent and default password are enabled. Click OK and try again. Appears when you select Actions > Show Attributes in the AGA Binder when the Release 8.1 version of AGA is installed on an SCT computer with SCT version 11.1. AGA cannot access the SCT archive database because the default <i>Metasys</i> user name has a dynamic and encrypted password. To work around this issue, add a new user with Windows login authentication to the SCT archive database. 1. On the SCT computer, open SQL Management Studio, and connect to the SCT computer. Or, use Remote Desktop Connection and access the SCT computer to open and connect to the SCT computer. 2. In the Object Explorer, expand the Database folder and then expand the SCT archive database folder. 3. Right-click the Security folder and select New > User. 4. In the Database User - New window, select Windows user from the User type drop-down menu. The Select User or Group dialog box appears. 5. Type in the username in the Enter the objects name to select field. Click Check Names. 6. Click OK. 7. Enter the same username in the Login name field. 8. For the Default schema field, click the browse button. The Select Schema dialog box appears. 9. Click the Browse button next to the Enter the object names to select field. The Browse for Objects dialog box appears. 10. Select the db_owner option and click OK. 11. Click OK in the Database User - New window.
Double quotes cannot be entered in [action code name field].	Appears when you click Apply Changes and the specified action code field contains double quotation marks. Click OK and edit the action code using only single quotation marks.
Editing any Graphics Example shape may destroy some of the special features of the shape.	Appears when you select a Graphics Example shape in the Professional or Standard edition of Microsoft Visio 2003, 2007, or 2010 software and launch the Advanced Graphics Add-On. This message also appears when you change from one Graphics Example shape to another. Click OK to proceed and edit the shape as desired for your advanced graphic. Note: If you choose to modify the action codes of a shape from the Graphics Example, the custom properties of that shape do not function after editing the action codes using the Advanced Graphics Application.
Error while checking the ActionCode Checkbox.	Appears when you select an action code in the Advanced Graphics Application, but there is no Visio drawing open. Click OK . Close the Advanced Graphics Application. Open a Visio drawing and launch the Advanced Graphics Application.
Item already exists	Appears when you attempt to add an existing item into the Navigate dynamic list. Click OK .
Please add the elements in the listview.	Appears when you click Apply Changes, and the Discrete Color action code contains no items in the list view. Click OK and add items to the list.

Table 12: Troubleshooting and Warning Messages

Problem, Error, or Pop-Up Message	Solution
Please check the Hostname, Username and Password	Appears when: - you click OK on the SCT Login screen of the AGA Binder after entering incorrect login information. Click OK and verify that the Hostname, Username, and Password you entered are valid and correct. - you click OK on the SCT Login screen of the AGA Binder after not entering any login information. Close the application and relaunch the AGA Binder.
Please check the network connection and try again!	Appears when you select field points in the AGA Binder when the system is not in the network. Click OK and check the connection.
Please enter alphanumeric characters. First character should be an alphabet.	Appears when you click Apply Changes and the SVG Tag Attribute dynamic contains invalid characters. Click OK and make sure all characters are alphanumeric, where the first character must be alphabetic.
Please enter a valid javascript file.	Appears when you click Apply Changes and the Include dynamic has an invalid JavaScript file. Click OK and attach a valid file.
Please enter a valid sound file.	Appears when you click Apply Changes and the Sound dynamic has an invalid sound file. The valid format is .wav. Click OK and attach a valid file.
Please enter a valid URL starting with "http://"	Appears when you click Apply Changes and the Hyper Link dynamic has an invalid link. Click OK and enter a valid link.
Please enter a value in the Object Reference/Local Variable text box	Appears when you click OK in the Expression Builder without entering valid data in the Object Reference/Local Variable text box. Click OK and enter a valid object reference/local variable in the Expression Builder's Object Reference/Local Variable text box.
Please enter the value in [action code name field].	Appears when you click Apply Changes and the specified action code field contains no expression. Click OK and enter the value in text expression.
Please open a Visio Drawing and select a Shape before launching AGA Action Code AddOn.	Appears when you attempt to launch the Advanced Graphics Application without opening a drawing in the Professional or Standard edition of Microsoft Visio 2003, 2007, or 2010 software. Click OK . Open the Visio drawing, select a shape, and launch the Advanced Graphics Application as instructed in this Help system.
Please select a field point.	Appears when you select Actions > Show Attributes in the AGA Binder without first selecting a field point. Click OK and select a field point.
Please select a valid shape to continue.	Appears when you attempt to launch the Advanced Graphics Add-On Application without first selecting a shape in the Visio 2003, 2007, or 2010 software. Click OK and select a shape in Professional or Standard edition of Microsoft Visio before launching the Advanced Graphics Application.
Please select an archive.	Appears when you select Actions > Get Field Points in the AGA Binder without first selecting an archive. Click OK and select an archive.
Please select only one Shape. ¹	Appears when you select more than one shape in the Professional or Standard edition of Microsoft Visio 2003, 2007, or 2010 software and attempt to launch the Advanced Graphics Application. Click OK . Select one shape in Visio and launch the Advanced Graphics Application as instructed in this Help system.
Please update the items.	Appears when you select items in the Discrete Color list view and click Apply Changes without first clicking the Update or Remove button. Click OK and update or remove the items.
Required Field	Appears when you click Apply Changes in the Advanced Graphics Application and a required field for the configuration is missing. Verify that the mandatory details for all of the selected action codes have been entered. There should be no empty fields.
Some of the action codes were deleted as they were not completely configured.	Appears while saving the file with action codes configured improperly and the program deleted the incorrect action codes. Click OK . Check that the shape has action codes configured properly.

Table 12: Troubleshooting and Warning Messages

Problem, Error, or Pop-Up Message	Solution
The active window in Visio must be a drawing window with a selected shape for this Addon to work.	Appears when you open the shape sheet and attempt to launch the Advanced Graphics Application Add-On screen. Click OK and select a shape in the Professional or Standard edition of Microsoft Visio 2003, 2007, or 2010 software drawing workspace before launching the Advanced Graphics Application. Note: After this warning message appears, the Error while checking the Action Code Checkbox warning appears. See Error while checking the ActionCode Checkbox in this table.
The application is not licensed. Please contact Johnson Controls support group for further details.	Appears in the Advanced Graphics Application every 15 minutes if the program is not properly licensed. Click OK and activate the Advanced Graphics Application license using the instructions in the <i>Software License Activator Technical Bulletin (LIT-1201654)</i> . You must activate the Advanced Graphics Application license with its own Site Key. For help, contact your local Johnson Controls representative.
The current form is being closed. Do you want to save the changes? ³	Appears when you exit or cancel out of the Advanced Graphics Add-On Application without saving. Click Yes if you want to save the changes. Click No if you do not want to save the changes. Click Cancel to go back to the Advanced Graphics Add-On Application.
The current Visio drawing is being closed. Do you want to save the changes? ³	Appears when you close a Visio drawing without saving. Click Yes if you want to save the changes. Click No if you do not want to save the changes. Click Cancel to go back to the Visio drawing.
The Expression Builder is being closed. The changes done in the Expression Builder will not be reflected, if you proceed further. Do you want to continue?	Appears when you exit or cancel out of the Expression Builder without applying your changes. Click Yes to proceed without saving. Click No to return to the Expression Builder and save/apply your changes.
The Sound File associated with SOUND Action [path_to_file] is invalid.	Appears when you attempt to save a graphic and the Sound dynamic has an invalid sound file. The valid format is .wav. Click OK and attach a valid file. This error also appears if you enter a valid wav file with the incorrect file name or path. Click OK and correct the file name or path of the wav file.
There has been a change in selection in the Visio drawing and some changes were made to the earlier selection. Do you want to apply the changes? ⁴	Appears when you select a different shape in the Visio drawing without saving the changes you made to the first shape. Click Yes if you want to apply the changes. Click No if you do not want to apply the changes.
There is no shape selected. Please select a shape to continue. ⁵	Appears when you click off of the previously selected shape in the Visio drawing and a shape is not selected. Click OK and select a shape in the Professional or Standard edition of Microsoft Visio 2003, 2007, or 2010 software.
Visio process has been terminated AGA ActionCode AddOn is exiting.	Appears when the Professional or Standard edition of Microsoft Visio 2003, 2007, or 2010 software is forced to close (for example, from the Task Manager).
You must first choose an SCT host for the AGA to login to	Appears when you attempt to log in to an SCT without entering a host. Click OK and enter a host.

Table 12: Troubleshooting and Warning Messages

Problem, Error, or Pop-Up Message	Solution
404 Not Found	Appears because Internet Information Services (IIS) on the Windows Server® 2008 or later operating system is asked to open a file with an extension that is not registered with IIS. Symptoms of this situation include a nonresponsive Internet Explorer web browser and a progress bar that never reaches completion. To register your SVG and SVGZ files: 1. In Control Panel on the Advanced Graphics Application computer, select Administrative Tools > Internet Information Services (IIS) Manager. The Internet Information Services (IIS) Manager window appears. 2. In the navigation tree on the left, navigate to the (local computer) > Sites > Default Web Site. 3. In the Default Web Site Home window, double-click MIME Types. 4. In the Actions window, click Add. 5. In the Add MIME Type window, type SVG in the File name extension field and type image/svg+xml in the MIME type field. 6. Click OK. 7. In the Actions window, click Add. 8. In the Add MIME Type window, type SVGZ in the File name extension field and type image/svg+xml in the MIME type field. 9. Click OK. 10. Close the Internet Information Services (IIS) Manager window.
You are having syntax and rendering errors with the Release 3.0 or later Advanced Graphics Application.	Release 3.0 or later Advanced Graphics Application does not allow any syntax errors in the SVG and does not draw graphics with syntax problems. The Release 3.0 or later Advanced Graphics Application may make rendering errors with certain types of SVG. For example, graphics like the following may experience problems: • Five rectangular diagonal gradients (Visio software fill patterns 31–35) appear transparent when you view the advanced graphic in the SMP UI. • Line endings (arrowheads) created in Visio graphics software do not appear when you view the advanced graphic in the SMP UI. • Embedded OLE objects may experience problems, including Computer Aided Drafting (CAD) artwork that has not been ungrouped, Windows MetaFile data that has not been ungrouped, or command buttons from the Microsoft Controls palette.

- 1 This message does not appear if you have the **Hide warning on multiple shape selection** option of the AGA Preferences dialog box selected. See the [Preferences](#) section.
- 2 This message does not appear if you have the **Always Save Changes** option of the AGA Preferences dialog box selected. See the [Preferences](#) section.
- 3 This message does not appear if you have the **Hide warning on closing the editor** option of the AGA Preferences dialog box selected. See the [Preferences](#) section.
- 4 This message does not appear if you have the **Hide warning on shape selection in Visio** option of the AGA Preferences dialog box selected. See the [Preferences](#) section.
- 5 This message does not appear if you have the **Hide warning on deletion of shape in Visio** option of the AGA Preferences dialog box selected. See the [Preferences](#) section.

Related Documentation

Table 13: Related Information

For Information On	See Document
Installing the Advanced Graphics Application software	<i>Advanced Graphics Application Installation Instructions (LIT-12011525)</i>
How to use the User Graphics Tool	<i>User Graphics Tool (UGT)</i> section of the <i>Metasys® SMP Help (LIT-1201793)</i>

Table 13: Related Information

For Information On	See Document
Metasys system	<i>Metasys® System Configuration Guide (LIT-12011832)</i>
Metasys system terms and acronyms	<i>Metasys System Extended Architecture Glossary (LIT-1201612)</i>

1 This LIT number represents a printer-friendly version of the Help.

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Building Technologies & Solutions
507 E. Michigan Street, Milwaukee, WI 53202

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