



# iFIX 6.1

## Creating Pictures



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# Creating Pictures

The Creating Pictures manual is intended for process control engineers, integrators, and developers responsible for designing and creating operator displays, and configuring the development and run-time environments. The manual assumes familiarity with the process database and the iFIX® WorkSpace.

## Reference Documents

For related information on iFIX®, refer to the following manuals:

- [Building a SCADA System](#)
- [Understanding iFIX](#)
- [Writing Scripts](#)
- [Implementing Alarms and Messages](#)
- [Trending Historical Data](#)

## See Also

[Introduction](#)

[Getting Started](#)

## Introduction

iFIX® allows developers and process engineers to create dynamic pictures with minimal effort. By providing an open-environment, ActiveX format, iFIX lets you incorporate internet controls (OCXs), reuse elements from other sources (such as bitmaps), or embed other OLE automation applications into your pictures.

While creating pictures in the iFIX WorkSpace, you can utilize features that give you the control you need to customize your drawings. You can view your pictures by merely switching to the run-time environment with the click of a mouse.

## Picture Coordinate Systems

Before creating or editing pictures or dynamo sets, it is important to be aware of the coordinate system you are using. iFIX 5.8 supports the following two coordinate systems:

- Logical
- Enhanced

The Logical Coordinate System is the legacy system that supports graphics created with iFIX 5.5 or earlier. The Logical Coordinate System uses logical units for measurement, and provides graphic scaling that is dependent on the screen resolution (or aspect ratio) of the terminal used to create the graphic; thus, graphics may not accurately scale to different screen sizes.

The Enhanced Coordinate System is a feature of iFIX 5.8, which uses postscript points for units of measurement instead of logical units. The Enhanced Coordinate System is a screen independent coordinate system, which accurately scales across different screens sizes. When the screen resolution (or aspect ratio) changes, the picture automatically adjusts to the new resolution (or aspect ratio).

iFIX 5.8 also provides a means to easily upgrade Logical Coordinate System graphics to the Enhanced Coordinate System. For more information on this feature, refer to the [Picture Coordinate System](#) section.

## Creating Pictures with Purpose

Whether you are a new or an expert user, iFIX gives you the power and flexibility to create pictures that provide solutions to your process needs. Let's take two scenarios to illustrate this concept:

- **Joe.** Joe is a system developer for a small shop. He is slightly intimidated by Visual Basic and would prefer not to learn scripting to create and control his pictures. However, he wants to take advantage of VBA's capabilities by customizing a few objects in his picture.

***Joe's Solution.*** Using iFIX Experts, Joe attaches scripts to the objects in his picture without leaving his development screen or entering the VBA environment. Experts give him a simple means to perform the processes he wants.

- **Janet.** Janet is a Process Manager for a large processing plant. She is well-versed in VBA, and is more than eager to unleash the power of iFIX using her knowledge of Visual Basic. Specifically, Janet wants the ability to override the default property settings of a series of existing objects and create her own properties, including complex animations from several different data sources and algorithms. She also wants to add custom controls and toolbars to simplify the process for her developers.

***Janet's Solution.*** iFIX provides the tools that Janet needs to fully customize her environment and fine-tune the control she has over her application. Using the Animations dialog box, she animates certain properties of her objects by specifying a data source and conversion method. Then, by writing VBA scripts, she overrides existing defaults, inserts custom controls, and creates a development toolbar that saves her developers time.

Having all the power you need doesn't mean it should be difficult to use. Developing complex pictures using process automation software was once a tedious and intimidating venture, as it required you to use proprietary command languages and graphics formats that, in the end, gave you limited flexibility. iFIX offers an alternate solution - an easy-to-implement and use, object and task-oriented development tool that lets you create pictures with purpose.

This manual details all of the concepts introduced in the above example. The following table helps you locate specific concepts throughout the various chapters.

iFIX Picture Concepts		
To learn about...	Refer to the section...	In the chapter...
Experts	Using Wizards and Experts	<a href="#">Using Process Assistants to Expedite Pictures</a>
Pictures as ActiveX Documents	What Makes up Your Picture	<a href="#">Implementing Pictures in Your Process</a>
The run-time envir-	Working with Objects in the Run-	<a href="#">Running Your Pictures</a>

## Getting Started

This chapter shows you how to start creating and drawing pictures right away. Some of the basic concepts of iFIX pictures are also described.

- [Creating and Opening Pictures](#)
- [The Object-oriented Nature of Pictures](#)
- [Using Basic Drawing Tools](#)
- [Using Basic Functions in Pictures](#)
- [Performing Advanced Functions in Pictures](#)

### Before You Begin

Before you start creating pictures, make sure you have started the iFIX WorkSpace. It is also helpful to know which data sources you want to connect to ahead of time.

### Creating and Opening Pictures

When you start the iFIX WorkSpace, you are ready to develop your picture. You can start by creating a new picture or opening an existing one.

Before you begin, it is important to know which coordinate system the picture uses. Typically, legacy pictures (iFIX 5.5 or earlier) use the Logical Coordinate System and new pictures (iFIX 5.8 or greater) use the Enhanced Coordinate System. For more information on coordinate systems, refer to the [Picture Coordinate System](#) section.

For Classic view, to create a new picture, click the New Picture button on the Standard toolbar as shown:



For Ribbon view, click the WorkSpace button, select New, and then click Picture. Or, click Picture in the New group, on the Home tab.

By default, the Create Picture Wizard appears and guides you through the picture creation process.

If a single untitled picture appears when you click the New Picture button, the Create Picture wizard has been disabled. Enable it by selecting the following check box on the Picture Preferences tab of the User Preferences dialog box: Show Picture Wizard from New Picture Menu.

For more information on the Create Picture wizard, refer to the [Using the Create Picture Wizard](#) section in the Implementing Pictures in Your Process chapter.

## Opening Existing Pictures

To open an existing picture, double-click the picture from the Pictures folder in the system tree. By default, the system tree is docked on the left side of the screen, and the picture appears to the right of it. To create more room for your picture, you can do any of the following:

- Dock the system tree on the other side of the screen by dragging it
- Set the system tree to float on top of your picture by dragging it away from the sides of the screen.
- Hide the system tree completely so that the picture appears to fit the full screen.

For more information on using the system tree of the WorkSpace, refer to the [Using the iFIX WorkSpace](#) chapter of the Understanding iFIX manual.

If the picture you opened has links to an external data source, such as a GE Historian server, which is not configured in the WorkSpace, you will receive an error message indicating that the data source is not configured in WorkSpace.

## Saving Pictures

In Classic view, to save your drawing, click the Save button on the Standard toolbar. In Ribbon view, to save your drawing, click the Application button, and then click Save. You can save your picture as either a .GRF file or .SVG file. Both file types are stored, by default, in the PIC folder in the path where iFIX is installed, but only .GRF files are displayed in the system tree. You can save .SVG files in any location but you cannot open them in iFIX Workspace, as these files are used for exporting to third-party applications.

When saving picture files, as either file type, you must follow the guidelines of VBA naming constraints. For example, do not use:

- Anything but a letter as the first character.
- Any of the following characters in a name: space, period, exclamation mark, @, &, \$, #.
- A name that exceeds 31 characters.
- A name used by any object in your iFIX application. For example, you cannot have both a picture and a rectangle named **test**.

Also, we recommend that you do not use any names that are common to other objects, functions, statements, or methods in Visual Basic, as you may cancel one of the keywords in the code. For more information on VBA Naming Conventions, refer to the [VBA Naming Conventions](#) section in the Writing Scripts manual.

## Picture Coordinate Systems

The picture coordinate systems uniquely determine the position of a point or other geometric element in a picture. All coordinates used by a picture, Dynamo Set, or animation are measured in the document's coordinate system, which can be either:

- Logical
- Enhanced

## Logical Coordinate System

The Logical Coordinate System is a legacy system that was used for pictures created with iFIX 5.5 or earlier. With the Logical Coordinate System, the screen resolution is measured in logical units. The logical unit value is derived from the screen resolution of the terminal on which the picture was originally created. When viewing this picture on a terminal with a different screen resolution, the picture may not automatically scale to the new screen resolution.

The Logical Coordinate System uses the following properties to identify the logical units used for the height and width of the document as displayed in the Property window.

Property	Description
DocumentHeight	Specifies the height of the document in logical units.
DocumentWidth	Specifies the width of the document in logical units.

With the Logical Coordinate System, the Auto Scale option allows you to move pictures between screens with the same resolution. However, when viewed on a screen with a different resolution, the picture may not scale as desired. When moving pictures to a screen with a different resolution, it is recommended to use the Enhanced Coordinate System.

## Enhanced Coordinate System

The Enhanced Coordinate System is provided for iFIX 5.8 and greater. With the Enhanced Coordinate System, you can create a picture that provides independence from restricted screen resolution. For the Enhanced Coordinate System, the dimension and position of a picture are measured in postscript points. The Enhanced Coordinate System features automatic scaling of a picture when viewed on a screen with a resolution that is different from the screen on which the picture was originally created. Once a picture is created with the Enhanced Coordinate System, the picture retains its original aspects even when viewed on screens with different resolutions.

The Enhanced Coordinate System uses the following properties to reflect the height, width, and coordinate system of the graphic. Refer to the [iFIX Automation Reference](#) e-book for more information on these properties.

Property	Description
DocumentHeightEx	Specifies the document height in postscript points.
DocumentWidthEx	Specifies the document width in postscript points.
EnhancedCoordinates	Identifies the picture coordinate system as either - True (Enhanced Coordinate System) or False (Logical Coordinate System).

You can upgrade a picture created with the Logical Coordinate System to the Enhanced Coordinate System. The Enhanced Coordinate System expert converts the picture from logical units to postscript points. During the upgrade process, the picture in the Logical Coordinate System is saved to a Backup folder before the picture is upgraded. This allows you to revert back to the original picture in logical units if you want to. Also, when a picture is upgraded, the icon changes to indicate the upgraded picture.

By default, the Enhanced Coordinate System is enabled for new pictures. Existing legacy pictures remain in the Logical Coordinate System until you upgrade them to the Enhanced Coordinate System.

## Zoom to Fit

The Enhanced Coordinate System provides a Zoom to Fit viewing preference that is enabled for run mode. Zoom To Fit suppresses scroll bars while allowing you to view the entire picture on your screen. The objects within the picture do not change their position and dimensions even when the picture is brought to a new screen resolution, which is different from the resolution on which the picture was developed. Zoom to Fit does not change the location of the objects/shapes within your picture, but scales the picture for viewing only. For more information on using Zoom to Fit, refer to the [Selecting Zoom to Fit](#) section.

By default, Zoom to Fit is enabled for run mode. You may wish to disable this preference for a special purpose. To disable Zoom to Fit in run mode, for all pictures de-select the Zoom to Fit in Run mode check box on the General tab of the User Preference dialog Box. To disable this preference for a specific picture, put a script under the picture initialization code to call "ME.ZoomToFit False." For more information on this script, refer to the [ZoomToFit Method Example](#) in the [iFIX Automation Reference](#) e-book.

**NOTE:** Zoom to Fit does not apply to a document that uses the Logical Coordinate System.

**IMPORTANT:** iFIX screens depend on the Dots Per Inch (DPI) setting of the physical display monitor and should always be at the recommended setting. Failure to do so may cause the picture to display improperly.

## Button Caption Converter

The Button Caption Converter allows you to scale command button captions (text) when used in a picture with a screen resolution that is different from the resolutions in which the picture and command button caption were created. When text does not scale properly for a command button, the Button Caption Converter expert converts the caption text to scale across zoom factors and screen resolutions and places an overlay on the original command button caption. Using the Button Caption Converter expert, you can scale one, some, or all of the command button captions in a picture. This is useful when viewing pictures and text with Zoom to Fit. The Button Caption Converter expert supports the Enhanced Coordinate System only. The Button Caption Converter does not apply to a document that uses the Logical Coordinate System. For more information on using the Button Caption Converter, refer to the [Converting Button Captions](#) section.

## Coordinate System Summary

The following table summarizes the characteristics of each coordinate system.

Characteristic	Logical Coordinate System	Enhanced Coordinate System
iFIX support	Version 5.5 or earlier  <b>NOTE:</b> Pictures using the Logical Coordinate System can be viewed and edited with iFIX 5.8.	Version 5.8 and greater
Measurement used for screen dimensions	logical units	postscript points
Default picture size (height and width)	100 x 75 logical units	postscript points, calculation based on the screen resolution

Picture height property	<a href="#">DocumentHeight</a>	<a href="#">DocumentHeightEx</a>
Picture width property	<a href="#">DocumentWidth</a>	<a href="#">DocumentWidthEx</a>
EnhancedCoordinates property	False	True
Picture Icon		
Dynamo Icon		
Views picture in entire screen option	Auto Scale	Zoom to Fit
Legacy picture backup and restore	No	Yes

## The Object-oriented Nature of Pictures

Many graphics programs work by giving you tools to manipulate *pixels*, a series of tiny dots that make up your computer monitor. When you add shapes to your drawing, the program translates these shapes into a matrix of dots, and changes the color of the screen pixels to match the dot matrixes. These dot matrixes are called *bitmaps*.

Although bitmaps are a common graphic format, they are limited in that once you create the image, there is very little you can do to change it. You can erase or partially erase a bitmap, or paint a new bitmap on top of the old one. But changing bitmaps takes almost as much time as creating them.

iFIX pictures, on the other hand, work with *objects* instead of individual pixels. An object-oriented graphic consists of an image and image attributes, such as size, color, and position, that define the properties of the object. By providing this object-oriented foundation, iFIX precludes your having to work with individual pixels. Rather, you interact with tools, menus, and dialog boxes to add and change object properties, while iFIX automatically adjusts the object and its property data for you. This gives you an enormous amount of control and flexibility when drawing and modifying your pictures.

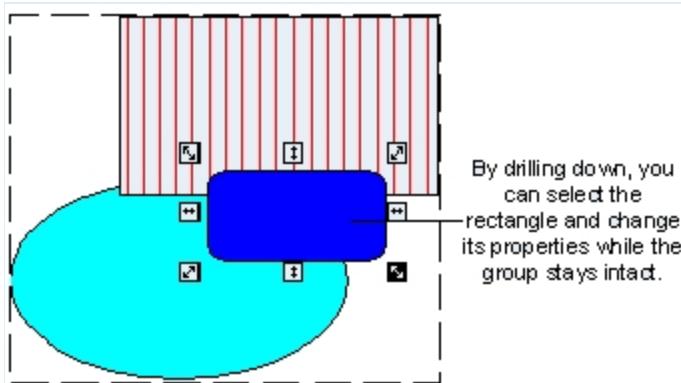
For example, many other graphics packages allow you to save object-oriented graphics as a Windows Metafile. iFIX allows you to import the metafile (in .WMF format) into a picture. The advantage of using a .WMF format is that the imported image consists of individual objects, giving you greater control of your picture.

The following figures illustrate some additional examples of the control and flexibility you have with iFIX pictures.

### The Control You Have With Your Pictures

In an iFIX picture, you can modify specific objects of a group without separating the objects from the group, and without losing scripts or animations applied to the group.

This concept is referred to as *drilling down*.

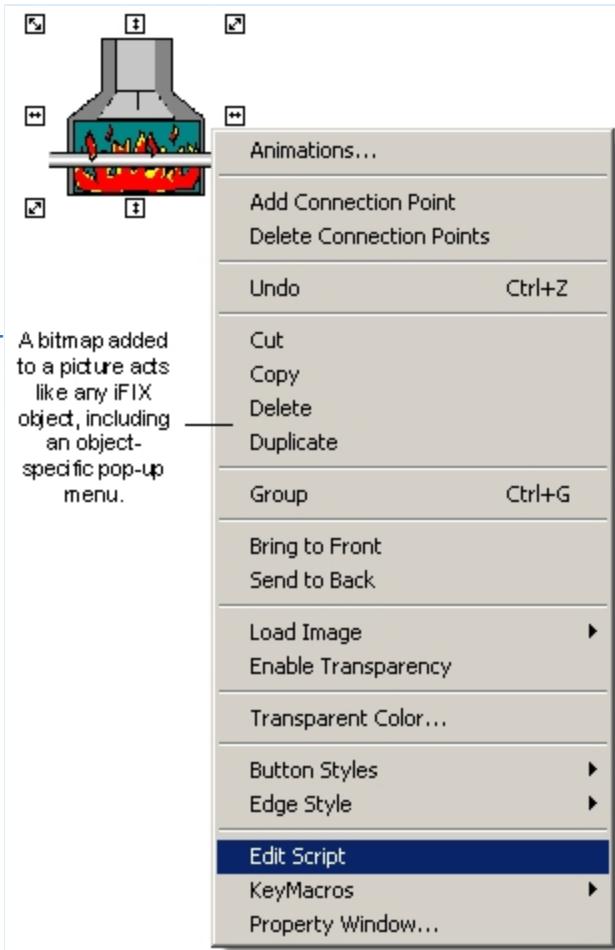


### The Flexibility You Have With Your Pictures

Given the popularity of bitmap formats, you may have an existing bitmap that you want to add to your picture.

iFIX makes this easy by letting you import the image into a picture as an object. Now you can control the image's properties like any other iFIX object.

For more information on adding a bitmap to a picture, refer to the [Implementing Pictures in Your Process](#) chapter.



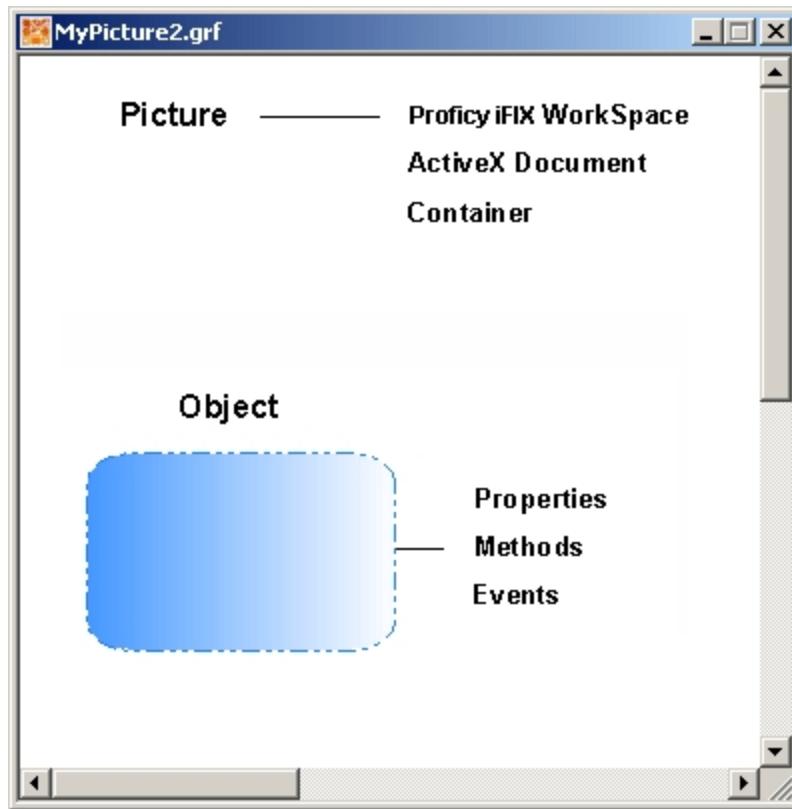
### How Objects Behave in Pictures

An *object* is anything that you create or import into an iFIX picture that has properties, methods, and events. In the next section we talk more about how objects work. After you have created an object in the iFIX WorkSpace's configuration environment, you can control its attributes and view its behavior in the run-time environment.

An object can be any of the following:

- **Shapes** - Shapes are integral to adding precise detail to your pictures. Shapes include rectangles, rounded rectangles, ovals, lines, polylines, polygons, arcs, chords, pies, and pipes.
- **Text** - Text added to an iFIX picture becomes an object, containing properties that allow you to format or control the text.
- **Bitmaps** - Bitmaps are images constructed of dot matrixes. They can be imported into an iFIX picture and controlled like any other object.
- **Charts** - Charts are compound objects made of lines, text, and rectangles that display real-time and historical trend data.
- **Data links** - Data links display text and values from process databases.
- **Alarm Summaries** - An Alarm Summary object displays real-time alarm status information based on your alarming and SCADA configuration. An Alarm Summary object is an iFIX OCX.
- **Push Buttons** - A push button is a tool that lets you execute an action easily with the click of a mouse. A push button is an OCX supplied Microsoft.
- **Timers** - Timers perform an action based on a specified time duration.
- **Events** - Events allow you to perform an operation based on a specific action.
- **Variables** - Variables allow you to specify different values that let you store and display process data in various ways.
- **ActiveX Controls** - compiled software components based on the component object model (COM). Any imported ActiveX control (OCX) becomes an iFIX object in the WorkSpace.
- **Applications** - Any OLE-compatible application, such as a Microsoft Excel spreadsheet, can be imported as a document object within the iFIX WorkSpace.
- **Animations** - When you animate an object's properties, iFIX adds animation objects to the object containing those properties.

An iFIX picture can contain many types of objects. The following figure illustrates the concept of objects inside an iFIX picture.



Example of Objects in an iFIX Picture

Objects consist of the following image attributes:

- Properties
- Methods
- Events

These attributes are described in the sections that follow.

#### Properties

All objects have *properties*. Properties are object attributes you can control, such as the foreground fill color or the object's size or position. These properties can be modified by animating the object or by writing a script.

#### Methods and Events

Objects also contain *methods* and *events*.

A *method* is a task that affects one or more objects. For example, a rectangle can be moved, rotated, and scaled, and these are all methods of the rectangle.

An *event* is a signal that an object generates that we respond to. For example, if you click the left mouse button or press a key on the keyboard, the object generates an event which you would respond to, typically by executing a script. Note that the action which triggers an event does not have to be a user action, it can be another script, an application, or the operating system.

Typically, when drawing pictures you work with properties more than methods and events. However, you may want to access an object's methods and events in order to write scripts for the objects you create. For more information on properties, refer to the [Controlling Object Properties](#) chapter.

## Using Basic Drawing Tools

The iFIX configuration environment contains several tools that help you access, modify, and apply an object's characteristics into your picture design. These tools are described in the following sections.

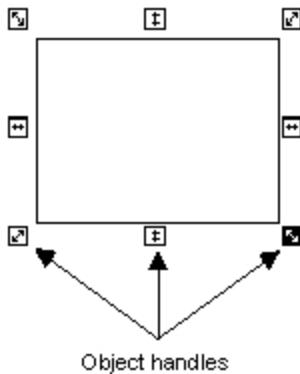
- [Using Drawing Cursors](#)
- [Using Toolbars](#)
- [Using the Toolbox](#)
- [Using the Object Pop-up Menu](#)
- [Using the Properties Window](#)
- [Using the Color Box](#)
- [Using the Find Mouse Coordinates Tool](#)
- [Using the Animations Dialog Box](#)

### Using Drawing Cursors

When you draw pictures, you have many different cursors to use depending on what you are trying to do. Many of these cursors appear when you have selected an object and place the cursor over the object's *handles*. The handles of an object provide points that control the movement of the object. Object handles appear in three types, depending on the operation you are trying to perform:

- **Resize Handles** - Allow you to resize an object. These automatically appear when you initially add most objects.
- **Reshape Handles** - Allow you to reshape an object. These automatically appear when you initially add lines, arcs, chords, and pies.
- **Rotate Handles** - Allow you to rotate an object. These handles appear only when you rotate a particular object (excluding ovals, rounded rectangles, charts, and bitmaps).

The following example illustrates a rectangle with resize handles. There are four diagonal handles, two left and right handles, and two top and bottom handles, as shown. When you initially add an object, object handles appear. If you select outside the object, its handles disappear. Place the cursor on the object and click (select) the object to display the handles again.



*Object Handles*

For examples of reshape and rotate handles, refer to the [Reshaping Objects](#) and [Rotating Objects](#) sections, respectively. When you display the object's handles, you can control that object on the screen. Notice that when you display the handles, that object's name is highlighted in the system tree. The following table shows each cursor that is available, where it can be accessed in the iFIX WorkSpace, and what the cursor allows you to do.

#### Using Drawing Cursors

The Cursor...	Positioned...	Does this...
	In the iFIX WorkSpace document outside of an object; or anywhere in the system tree.	Selects an object or folder in the system tree, begins clicking and dragging objects (left-click), or displays a picture pop-up window (right-click).
	Anywhere on your screen.	Alerts you that the system is working and no input can currently be processed.
	On an object or group of objects.	Selects an object (single-click), displays the pop-up menu (right-click), moves an object by clicking and dragging, or displays the Animations dialog box (double-click).
	On the up/down object handle, or at the top or bottom edge of the picture.	Resizes an object or picture up or down.
	On the left/right object handle, or at the left or right edge of the picture.	Resizes an object or picture left or right.
	On the diagonal object handle, or at corner edges of the picture.	Resizes an object or picture diagonally.
	Right edge of the system tree.	Expands the system tree.

	In system tree, dragging into picture.	Drags and drops objects or Dynamos to a picture. The second cursor indicates that the location you are dropping to is not valid.
	In the Edit Color palette when customizing colors.	Selects a color range.
	On objects with points.	Adds or deletes a point to an object. The white cursors on the left indicate that a point cannot be added or deleted. The black cursors on the right indicate a point can be added or deleted.
	On pipe and polyline objects.	Splits pipes or polylines. The yellow cursor on the left indicates that a pipe can be split at that point. Note that the yellow cursor can actually be any contrasting color, depending on the color of the pipe object.  The black cursor on the right indicates that a polyline can be split at that point. The white cursors indicate that pipes and polylines cannot be split at those points.
	Anywhere when adding or reshaping shapes or charts.  Also appears on an object's center of rotation circle.	Provides a starting point to add or reshape a shape or chart by clicking and dragging to a location.  As a rotation cursor, selects the center of rotation so that you can relocate it by clicking and dragging the circle.
	Anywhere when adding data links, current date, or current time.	Adds a data link, current date, or current time.

## Using Toolbars

iFIX provides both WorkSpace and Picture toolbars to help you perform various functions. Although both WorkSpace and Picture toolbars help you perform actions in your picture, the Picture toolbars contain specific tools to help you create and modify objects and their properties. The following table describes the Picture toolbars available to you for drawing pictures.

**NOTE:** Although hidden by default, you can access and use toolbars in Ribbon view. To access a toolbar in Ribbon view, on the Home tab, in the WorkSpace group, click Settings, and then click Toolbars. You can also open a toolbar from the WorkSpace tree, by opening the Project Toolbar Files folder and double-clicking the toolbar you want to open.

### Using Toolbars to Create and Modify Pictures

The toolbar...	Which can be accessed in Ribbon view...	Lets you...
Shapes	From the Insert tab, in the Shapes group, in the Shapes list.	Add shapes to your pictures. Refer to the <a href="#">Adding Objects to Pictures</a> section for a list of the shapes you create.

Edit	From the Home tab, in the Clipboard and Editing groups.	Perform basic functions with objects, including cutting, copying, pasting, and undoing an action. Refer to the <a href="#">Performing Basic Functions with Objects</a> section for more information on these functions.
ChartGroup Toolbar	From the Tools tab, in the Chart group	Performs functions on objects in pictures such as applying the chart group wizard to a chart. For additional information, refer to the Trending Historical Data ebook.
Translation Toolbar	From the Home tab, in the WorkSpace group, in the Settings tab, in the Toolbars group, on the Pictures toolbar selection window	Changes the language of the text in a picture that is open in run mode. For more information, refer to the <a href="#">Translating Picture Text</a> section.
CAD Toolbar	From the Home tab, in the WorkSpace group, in the Settings group, in the Picture Toolbar, or  From the Format tab, in the Picture group, in the drawing Tools list.	Perform functions with line objects in the picture, such as extending and trimming lines, converting lines to polylines, converting lines to pipes, or adding/deleting connection points. Refer to the <a href="#">Performing Advanced Functions with Objects</a> section for more information on these functions
VisionX Toolbar	From the Insert tab, in the VisiconX Controls group	Select the function to insert into the picture. For more information, refer to the <a href="#">Using VisiconX</a> ebook.
Tools	From the Format tab, in the Arrange group.	Perform functions with objects in your pictures such as aligning or grouping them. Refer to the <a href="#">Performing Advanced Functions with Objects</a> section for a description of the functions you can perform.
Toolbox	From the Format tab, all groups and from the Tools tab, in the Tasks/Experts group.	Select the most commonly used toolbar buttons from a resizable box. Refer to the <a href="#">Using the Toolbox</a> section for more information.
Experts	From the Tools tab, in the Tasks/Experts group, from the Tasks/Experts list.	Perform advanced functions with objects in the picture or the picture itself, such as rotate, scale, or position. Refer to the <a href="#">Using Wizards and Experts</a> section for more information on using experts.
Web HMI	From the Tools tab, in the Web HMI group	Provides a Web HMI Toolbox to create high performance GE Web HMI graphics for export to GE Web HMI, or to create high performance iFIX pictures that use the High Performance color set and High Performance settings for shape and picture creation. For more information, refer to the <a href="#">Creating High Performance Pictures</a> e-book.

To show or hide a Picture toolbar, select Toolbars from the WorkSpace menu, select Picture in the Owner area, and then select or deselect the appropriate toolbars. You must have a picture open in order to select Picture from the Owner area. For more information on toolbars, refer to the [Understanding Toolbars](#) section of the Understanding iFIX manual.

You can also create your own toolbars, or write scripts for custom buttons in toolbars. For more information on creating and customizing toolbars, refer to the [Understanding Toolbars](#) chapter of the Understanding iFIX manual. For information on writing scripts to customize toolbars, refer to the Writing Scripts manual.

## Using the Toolbox

By default, many of the toolbar buttons appear in a Toolbox, allowing you to quickly select the buttons you want from one place. The Toolbox is also a convenient way to save space in your picture by not having several individual toolbars open. You can click and drag the Toolbox to position it anywhere in the picture, or click and drag one of its edges to resize it.

If you would rather select buttons from specific toolbars, simply deselect the Toolbox in the Toolbars dialog box.

The following table lists the names of the toolbar buttons found in the Toolbox. The layout of the cells in the table mimics the layout of the corresponding buttons in the Toolbox. The following layout is the default layout of the Toolbox.

Pointer Selection		Copy	Paste	Time	Date
Rectangle	Rounded Rect-Oval angle		Chord	Polygon	Pie
Pipe	Arc	Line	Polyline	Text	Pushbutton
OLE Object	Set Color	Datalink	Historical	Alarm Summary	Variable Object
Chart	Event	Stamper	Datalink	Line Multiline	X Bar Chart
R Bar Chart	S Bar Chart	Bitmap	Set Font	Chart	
Space Evenly	Space Evenly	Histogram	XY Chart	Standard Cart	Toggle Grid
Vertical	Horizontal	Chart			
Align Horizontal	Align Vertical	Align Top	Align Left	Align Bottom	Align Right
Center	Center	Group	Ungroup	Bring to Front	Send to Back
Set Layer	Display Layers	Foreground	Position	Position Expert	Position Expert
		Color Expert	Expert		
Scale Expert	Visibility	Create Picture	Open Picture	Close Picture	Replace Picture
	Expert	Wizard	Expert	Expert	Expert
Refresh Rate	Data Entry	VisiconX Data	VisiconX	VisiconX List	VisiconX Combo
Expert	Expert	Control	Grid Control	Box Control	Box Control
Undo					

## Using the Object Pop-up Menu

As you create a picture, you can display a pop-up menu for the picture or an object in the picture. To display an object's pop-up menu, right-click the object. This menu provides quick access to the object's properties and animations, as well as common operations you can perform with the object, such as copying and pasting.

You can also access this menu by right-clicking the object in the Pictures directory of the system tree. This is an effective way to view or adjust properties for invisible objects (which only appear in the system tree) added during animation.

**NOTE:** The pop-up menu for objects differs somewhat from the picture pop-up menu. Refer to the [Using the Picture Pop-up Menu](#) section for more information on the picture pop-up menu.

The following table shows the functions that are available from the object pop-up menu. Depending on the object you have selected, additional operations may be available.

Use the operation...	To...
Animations	Display the Animations dialog box, which allows you to animate the properties of an object or several objects.
Resize	Display handles around the object so you can resize it.
Reshape	Display handles around the object so you can reshape it.
Rotate	Display rotate handles around the object so you can move the object around its center of rotation.
Add Connection Point	Display a square green cursor with a smaller square inside it and a crosshair when you are close to or moving over the object. This menu item displays as Add Point when you right-click a polyline or pipe object.
Dynamo	Displays a Dynamo
Delete Connection Point	Display a square, solid red cursor with a cross hair when you are close to a connection point that can be deleted. When not close, the cursor becomes a red square with a minus sign and a crosshair. This menu item displays as Delete Point when you right-click a polyline or pipe object.
Split Polyline	Display a splitting cursor that changes to black when you are close to the polyline. A black cursor indicates that you can split the polyline at that point.
Convert to Pipe	Convert the line or polyline to a pipe object.
Split Pipe	Display a splitting cursor that changes to a contrasting color when you are inside the edge of the pipe. A colored cursor indicates that you can split the pipe at that point.
Make Horizontal	Make the line horizontal.
Make Vertical	Make the line vertical.
Undo	Cancel the previous operation. If a particular task cannot be undone, the Undo command is unavailable after you complete the action.
Cut	Remove the object from the picture and places it into the clipboard.
Copy	Create a duplicate copy of the object and place it into the clipboard.
Delete	Remove the object from the picture.
Duplicate	Create a duplicate copy of the object and place it slightly offset from the original.
Group	Combine one or more objects into one grouped object.

Bring to Front	<p>Move the selected object to the front or top of the picture.</p> <p><b>NOTE:</b> This function may not work as expected with Enhanced Charts.</p>
Send to Back	<p>Move the selected object to the back or bottom of the picture.</p> <p><b>NOTE:</b> This function may not work as expected with Enhanced Charts.</p>
Color	Define fade, foreground, background, and edge colors using a color palette.
Fill Style	<p>Specify a fill style of one of the following:</p> <ul style="list-style-type: none"> <li>• Solid</li> <li>• Hollow</li> <li>• Horizontal</li> <li>• Vertical</li> <li>• Downward Diagonal</li> <li>• Upward Diagonal</li> <li>• Cross Hatch</li> <li>• Diagonal Cross Hatch</li> <li>• Gradient</li> </ul> <p>Refer to the <a href="#">Coloring and Styling Objects</a> section for further information on fill styles.</p>
Edge Style	<p>Specify an edge style of one of the following:</p> <ul style="list-style-type: none"> <li>• Solid - Applies a solid line style</li> <li>• Dash - Applies a dashed pen line style</li> <li>• Dot - Applies a dotted pen line style</li> <li>• Dash Dot - Applies a dash-dot combination line style</li> <li>• Dash Dot Dot - Applies a dash-dot-dot combination line style</li> <li>• No Edge - Specifies that the object contains no edge style</li> <li>• Inside Frame - Applies a solid line style inside the frame of the object</li> </ul> <p><b>NOTE:</b> If you set the edge width to greater than 1, it displays as Solid regardless of the selected edge style in the pop-up menu or the Shape Preferences tab on the User Preferences dialog box.</p>
Background Style	Specify a background style of either opaque or transparent.
Fade Type	<p>Specify a fade type of one of the following:</p> <ul style="list-style-type: none"> <li>• Linear - Applies a vertically linear fade type inside the frame of the object.</li> <li>• Reflected - Applies a horizontally reflected fade type inside the frame of the object.</li> <li>• Radial - Applies a radial fade type inside the frame of the object.</li> <li>• Concentric - Applies a concentric fade type inside the frame of the object.</li> </ul> <p>Refer to the <a href="#">Coloring and Styling Objects</a> section for further information on fade types.</p>

Edit Script	Open the Visual Basic Editor, which allows you to edit Visual Basic scripts.
KeyMacros	Open the Key Macro Editor, which allows you to add and edit key macros.
Property Window	Display the Properties Window, which allows you to view and change property values.
Elbow Style	Specify an elbow style for a pipe object. These styles include: <ul style="list-style-type: none"> <li>• Round - Applies rounded edges to the bends in a pipe object.</li> <li>• Square - Applies squared edges to the bends in a pipe object.</li> </ul>
Start Cap Style	Specify a start cap style for a pipe object. These styles include: <ul style="list-style-type: none"> <li>• Round - Applies a rounded cap at the starting point of the pipe object.</li> <li>• Square - Applies a square cap at the starting point of the pipe object.</li> <li>• Horizontal Diagonal - Applies a horizontally diagonal cap at the starting point of the pipe object.</li> <li>• Vertical Diagonal - Applies a vertically diagonal cap at the starting point of the pipe object.</li> </ul>
End Cap Style	Specify an end cap style for a pipe object. These styles include: <ul style="list-style-type: none"> <li>• Round - Applies a rounded cap at the ending point of the pipe object.</li> <li>• Square - Applies a squared cap at the ending point of the pipe object.</li> <li>• Horizontal Diagonal - Applies a horizontally diagonal cap at the ending point of the pipe object.</li> <li>• Vertical Diagonal - Applies a vertically diagonal cap at the ending point of the pipe object.</li> </ul>
Modify Pipe Characteristics	Open the Modify Pipe Characteristics dialog box, which allows you to edit the styles of pipe objects.
Edit CommandButton Object	Place a text cursor in the push button object to allow you to enter text.

Depending on the object you add, the pop-up menu may vary to include operations specific to that object. For example, if you add a chart, you can access the Chart Customization dialog box from the object pop-up menu.

#### Tag Status Pop-up Menu

When you associate database tags with an object, you can switch to the iFIX WorkSpace run-time environment to view and test the object's configuration. The run-time object provides a menu you can display by right-clicking the object. The options on the menu depend on the number of tags you associate with the object.

If you have associated tags with your objects, the following functions are available from the object pop-up menu in the run-time environment.

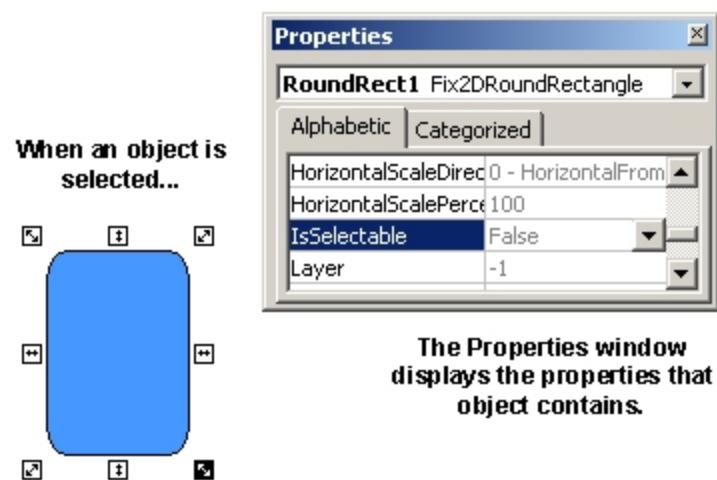
#### Run-time Object Pop-up Menu Commands

**Use the operation To...**

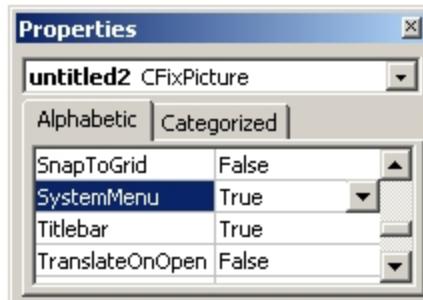
Tag Status	Open the Tag Status picture of the tag associated with the selected object. If multiple tags are associated with the selected object, open the Tag Status picture of the first associated tag, or open the Tag Control Panel picture, which lists the Tag Status pictures of all tags associated with the selected object.
Quick Trend	Open the Quick Trend picture of the tag(s) associated with the selected object(s). The Quick Trend picture displays up to eight pens when multiple tags are associated with the selected object(s).

## Using the Properties Window

You can display the properties of an object with the Properties window. This window displays a two-column list of the selected object's properties that accept data. The Properties window is *modeless*, meaning that you can jump to different positions in the picture and the window will stay on your screen. This is a convenient way to quickly read properties of several objects in your picture or a picture itself. If no object is selected, the current picture's properties are shown in the window. See the following examples.



**When an area outside  
the object is selected...**



**The Properties window stays on the screen, and displays the properties that the picture contains.**

You can also display a different set of properties by selecting the object or picture from the drop-down list at the top of the window.

To display the Properties window of an object, right-click the object and select Property Window from the pop-up menu. You can also access this menu by right-clicking the object in the Pictures directory in the system tree, or by selecting Property Window from the View menu.

For more information on selecting properties, refer to the [Controlling Object Properties](#) chapter.

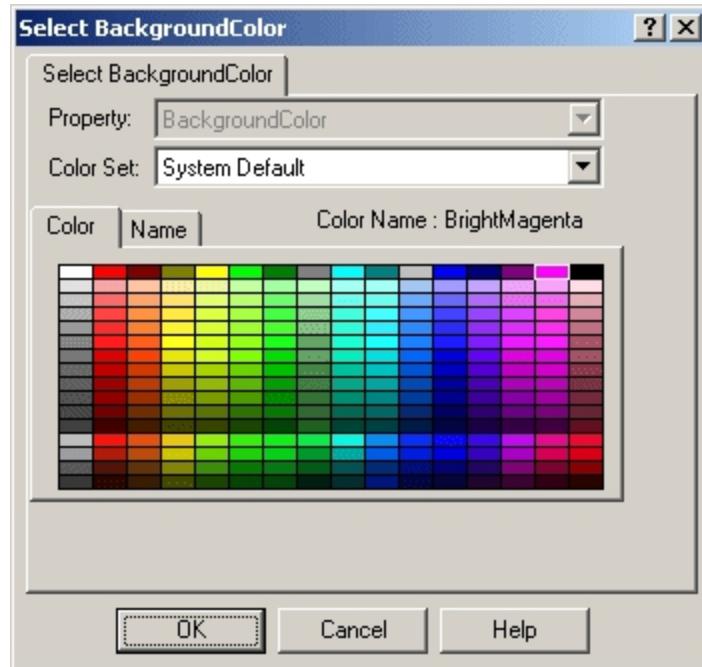
## Using the Color Box

The iFIX color box contains all the tools you need to assign colors to your objects and create customized color schemes. The color box offers over 16 million color possibilities for use in your pictures, and can be accessed from anywhere in the iFIX WorkSpace.

There are two color boxes you can choose from depending on how you want to apply colors. The first option is a Select Color box that lets you select fade, foreground, background, or edge colors for a specific object. This dialog

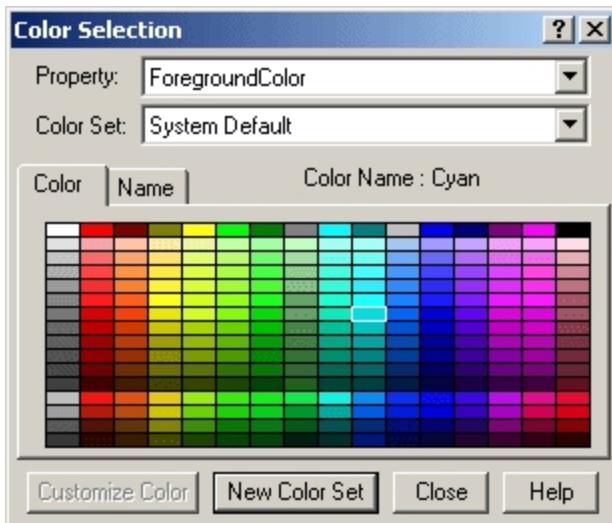
The iFIX color box contains all the tools you need to assign colors to your objects and create customized color schemes. The color box offers over 16 million color possibilities for use in your pictures, and can be accessed from anywhere in the iFIX WorkSpace.

There are two color boxes you can choose from depending on how you want to apply colors. The first option is a Select Color box that lets you select fade, foreground, background, or edge colors for a specific object. This dialog box, shown in the following figure, is accessed by right-clicking the object, pointing to Color then choosing Fade, Foreground, Background, or Edge from the menu.



**NOTE:** Refer to the [Setting Gradient Fill Properties](#) section, for more information about accessing the Select FadeColor and Select ForegroundColor dialog boxes.

The second option is the Color Selection box. This box is modeless, allowing you to select different shapes in your picture while the dialog box remains on your screen. You can color as many objects as you like using this box, and you can choose which property of the selected object or objects you want to modify. Additionally, you can use a color palette to customize a color set. The Color Selection dialog box, shown in the following figure, is accessed by clicking the Color button on the Tools toolbar (Classic view) or on the Format tab in the Styles group (Ribbon view) or the Toolbox, if enabled.



**NOTE:** Any time you open the Select Color or Color Selection dialog box, the undo stack is removed.

For more information on applying color to your pictures, refer to the [Working with Color](#) section.

## Using the Find Mouse Coordinates Tool

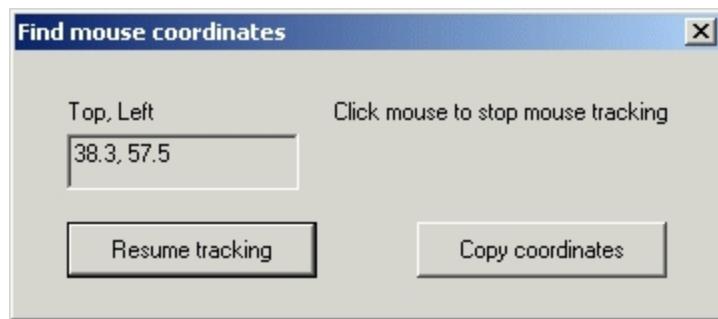
The Find Mouse Coordinates Tool is available to track the x,y coordinates of the mouse cursor in the iFIX WorkSpace. This is helpful if you want to open a picture in a specific location in the WorkSpace, but do not want to spend a lot of time guessing the coordinates of the location. This is especially useful if you are spanning an iFIX display across multiple monitors.

In Classic view, to access the Find Mouse Coordinates Tool, click the following icon in the iFIX WorkSpace, on the Utilities toolbar:



In Ribbon view, you may access the Find Mouse Coordinates Tool from the Tools tab, in the Tasks/Experts group, in the Pictures list or from the Applications tab, in the Utilities group, in the Utilities list.

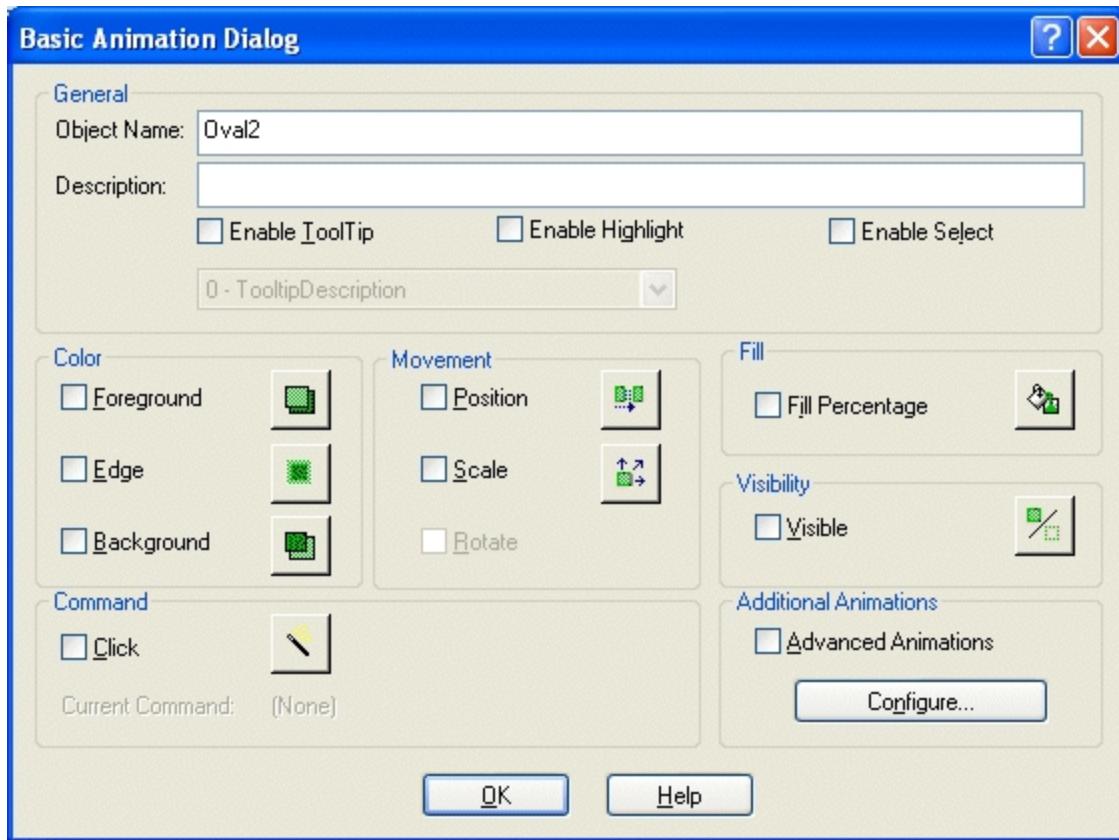
The Find Mouse Coordinates Tool appears in the WorkSpace, as shown in the following figure.



To stop tracking the cursor, click anywhere in the WorkSpace. To start tracking again, click the Resume tracking button. To copy the cursor coordinates to the clipboard, click the Copy coordinates button. After you copy the coordinates to the clipboard, you can paste them into your [OpenPicture](#) command, for example, as the coordinates for the top left corner of your picture.

## Using the Animations Dialog Box

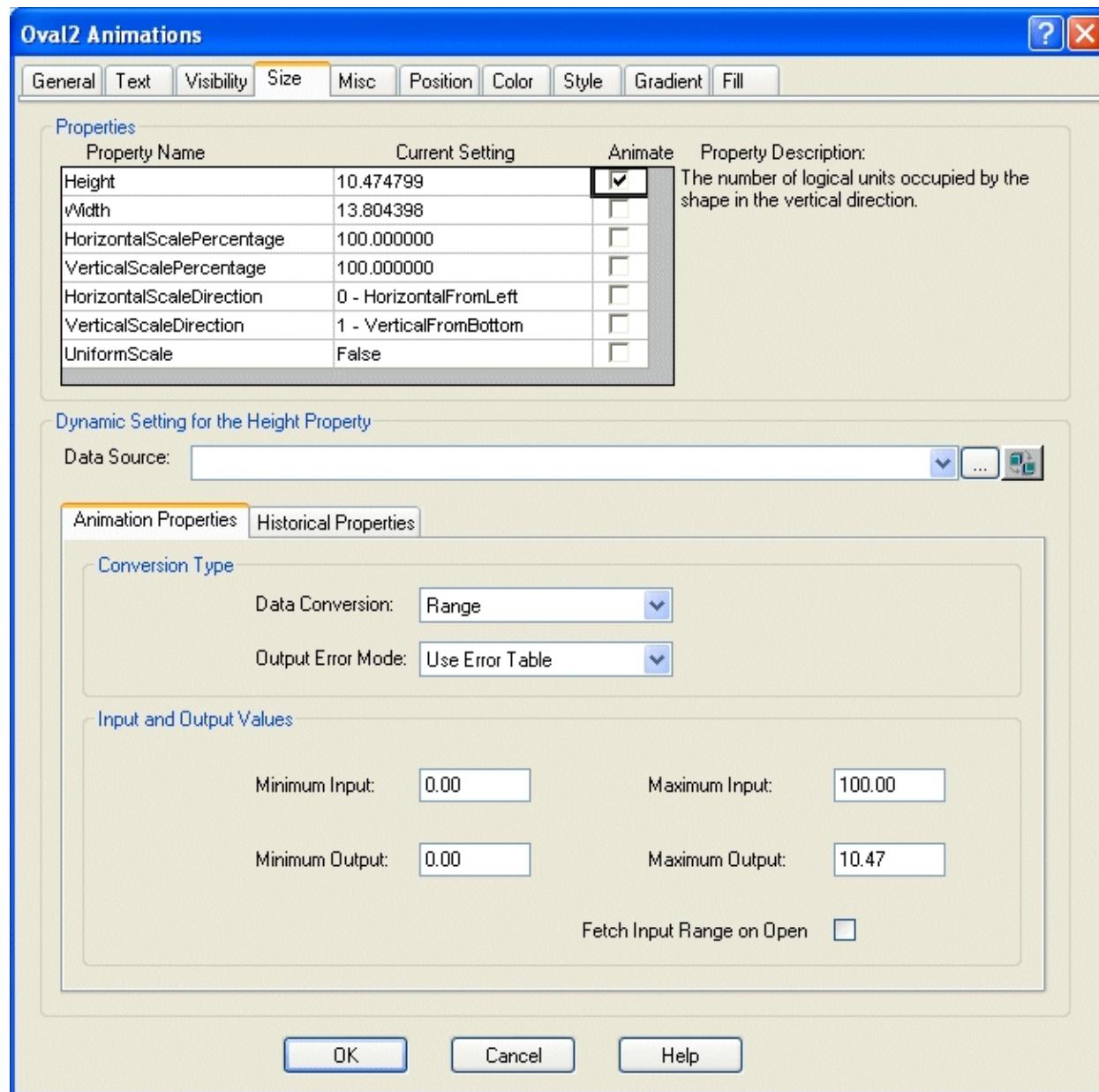
iFIX provides a Basic Animation dialog box, shown in the following figure, allowing you to access many commonly used Animation Experts in one location. These Animation Experts include Color, Movement, Fill, Click Command, and Visibility Animation Experts as well as providing a link to the Advanced Animations dialog box. The Advanced Animations dialog box allows you to access all of the available object animations and change properties by entering values into one of the tabbed pages.



*Basic Animation Dialog Box*

To access the Basic Animation dialog box, double-click on an object or select Animations from the object's right-click menu.

You can also access the Advanced Animations dialog box by clicking the Configure button in the Basic Animation dialog box. The Advanced Animations dialog box, shown in the following figure, allows you to access all of the property animations available to the selected object and also provides a more detailed interface for adding or modifying property animations.



*Advanced Animations Dialog Box*

To always open the Advanced Animations dialog box by default, clear the Always Show Basic Animation dialog check box in the Picture Preferences tab of the User Preferences dialog box.

**NOTE:** Any time you open the Animations dialog box, the undo stack is removed. This is because certain property changes take effect even if the dialog box is closed using the Cancel button.

Refer to the [Animating Object Properties](#) chapter for more information on animating objects.

## Using Basic Functions in Pictures

There are several functions you can perform in your picture, regardless of the objects it contains. These functions are described in the following sections.

- [Showing a Picture](#)
- [Refreshing a Picture](#)
- [Refreshing a Thumbnail](#)
- [Closing a Picture](#)
- [Using the Picture Pop-up Menu](#)
- [Using the Picture Properties Window](#)
- [Defining the Picture Height and Width](#)
- [Setting the Picture Background and Fade Color](#)
- [Setting Gradient Fill Properties](#)
- [Viewing Your Picture in the Run-time Environment](#)
- [Upgrading the Picture to the Enhanced Coordinate System](#)
- [Upgrading Hardcoded Values in Animations](#)
- [Converting Button Captions](#)
- [Restoring a Picture to the Logical Coordinate System](#)
- [Selecting Zoom to Fit](#)

## Showing a Picture

If you have more than one picture open in the WorkSpace, you can easily view a picture that is behind another one by doing one of the following:

- Double-clicking the picture name in the system tree.
- Right-clicking the picture name in the system tree and selecting Show from the pop-up menu.
- Select the picture name from the Window menu.

Another effective strategy for showing multiple pictures is using the tiling and cascading functions, described in the [Tiling and Cascading Pictures](#) section.

## Refreshing a Picture

You can refresh a picture by right-clicking the picture name in the system tree and selecting Refresh from the pop-up menu. You can also select Refresh from the View menu (Classic view) or from the View tab, in the Picture group, in the View list (Ribbon view). When you refresh a picture, iFIX repaints the current picture on the screen.

## Refreshing a Thumbnail

You can refresh a thumbnail by right-clicking the picture name in the system tree and selecting Refresh Thumbnail from the pop-up menu. When you refresh a thumbnail, iFIX saves the picture with a thumbnail (if it did not already exist), and repaints the current thumbnail on the System Tree.

## Closing a Picture

You can close a picture by right-clicking the picture name in the system tree and selecting Close from the pop-up menu.

## Using the Picture Pop-up Menu

When creating pictures, you can display a pop-up menu for that picture by right-clicking the picture name in the system tree, or by right-clicking any area in the picture outside of an object. The pop-up menu provides quick access to the picture's specific properties and animations, as well as common operations you can perform within the picture, such as selecting all objects.

The following table shows the functions that are available from the picture pop-up menu.

**NOTE:** Functions apply to both the Logical and Enhanced Coordinate Systems unless stated otherwise.

Picture Pop-Up Menu Functions

Use the Operation...	To...
Animations	Display the Animations dialog box that lets you animate properties of the picture.
Undo	Cancel the previous operation. If a particular task cannot be undone, the Undo command is unavailable after you complete the action.
Paste	Place the most recently copied object into your picture.
Select All	Select all objects in the picture window.
Bring to Front	Move the selected picture to the front of the stack.
Send to Back	Move the selected picture to the back of the stack.
Space Evenly	Tile the open pictures in one of the following ways: <ul style="list-style-type: none"><li>• Horizontal</li><li>• Vertical</li></ul>
Zoom	Change the width and height of the viewport by 50%, 150%, or 200% of the window size, or return the viewport size to 100% of the window size. The viewport is described in the <a href="#">Implementing Pictures in Your Process</a> chapter.
Default View	Restore the original view of the picture before the window's size was changed.  <b>NOTE:</b> This function applies only to Logical Coordinate System pictures. This function does not apply to Enhanced Coordinate System pictures.
Full View	Expand the window to occupy the entire client-area.

	<b>NOTE:</b> This function applies only to Logical Coordinate System pictures. This function does not apply to Enhanced Coordinate System pictures.
Fit Picture to Window	Resize the picture to fit inside the picture window, if necessary.  <b>NOTE:</b> This function applies only to Logical Coordinate System pictures. This function does not apply to Enhanced Coordinate System pictures.
Fit Window to Picture	Resize the window to fit the size of the picture, if necessary.  <b>NOTE:</b> This function applies only to Logical Coordinate System pictures. This function does not apply to Enhanced Coordinate System pictures.
Update Window Location	Preserve the current view of the picture so that, after being saved, it will look exactly the same way it did on the screen as when you closed it.
Refresh	Repaint the current picture in the picture window.
KeyMacros	Open the Key Macro Editor, which allows you to view and edit key macros.
Property Window	Display the Properties window for the current picture.
Picture	Display the Edit Picture dialog box, which allows you to change window properties.
Edit Script	Open the Visual Basic Editor, which allows you to edit Visual Basic scripts.
Enable Scripts	Reference all selected objects into Visual Basic scripts.

**NOTE:** The pop-up menu for pictures differs somewhat from the object pop-up menu. Refer to the [Using the Object Pop-up Menu](#) section for more information on the object pop-up menu.

## Using the Picture Properties Window

To display the Properties window of a picture, right-click the picture name in the system tree and select Property Window from the pop-up menu. For more information on Properties, refer to the [Controlling Object Properties](#) chapter.

## Defining the Picture Height and Width

You can define the height and width of the window in your picture using the Edit Picture dialog box.

The window dimensions are specified as percentages. For more information on implementing pictures, see the [Implementing Pictures in Your Process](#) section.

► **To define the picture height and width:**

1. Right click the picture name in the system tree.
2. Select Picture from the pop-up menu.

-Or-

In Classic view, select Picture from the Edit menu.

-Or-

In Ribbon view, on the Home tab, in the Editing group, in the Properties list, click Picture.

In the Properties section, type in the new Window Width or Window Height as percentages.

Click on the Apply button.

View the picture. Make any additional changes as you wish.

When you do not want to make any more changes, click the OK button to save the picture.

The Picture Preferences dialog box contains the default picture preferences that apply to newly created pictures.

## Setting the Picture Background and Fade Colors

You can set the background and fade colors of your picture using an unlimited selection of colors. This is useful for customizing your screens to complement multi-colored objects in your picture and to give your pictures a three-dimensional look. The default background and fade colors are displayed in the Picture Preferences dialog box when you create a new picture. You can change the default colors by clicking the Background Color or Fade Color buttons and choosing a color from the Select Color dialog box.

For more information on using color in your pictures, refer to the [Working with Color](#) section.

## Setting Gradient Fill Properties

The gradient fill features allow you to illustrate your real-world objects, like tanks and pipes, with a three-dimensional look. A gradient fill can also be used for the picture itself. The gradient fill is composed of fade color, fade type, blend percentage of fade color, and gradient angle of fade color. For more information about applying fade color, see [Setting the Picture Background and Fade Colors](#) and [Working with Color](#).

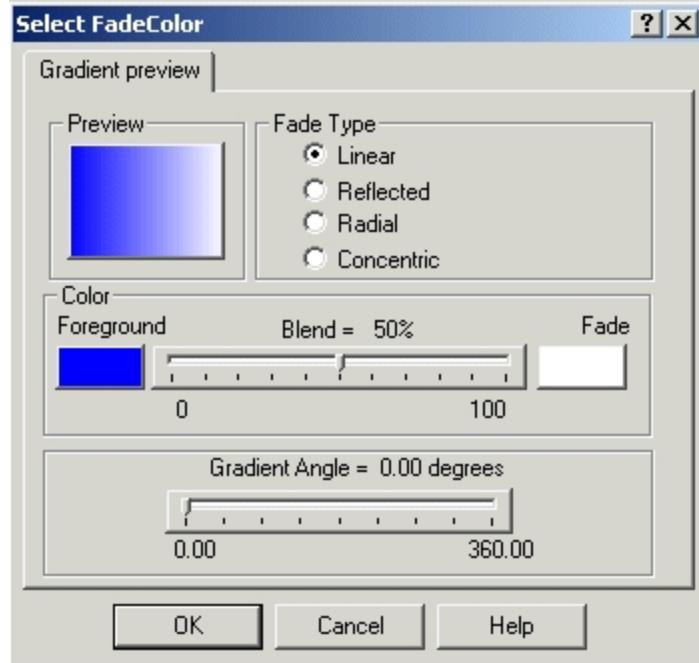
Like the behavior of other fill styles, you can animate the gradient effect with the shape; for example, rotate, scale, fill, and translate with the shape; however, you cannot animate gradient effects in your picture.

You can right-click an object and apply the individual gradient fill properties after you have set the fill style to Gradient. You can also apply the properties all at once using the gradient preview dialog box. The [gradient preview dialog box](#) for shapes contains the tools you need to preview and apply gradient fill properties.

The type of object you select determines the properties available for your use. For example, pipe objects have a different [gradient preview dialog box](#) where the properties specific to pipe objects are available, as well as gradient fill properties. For other shapes, only gradient fill properties are available.

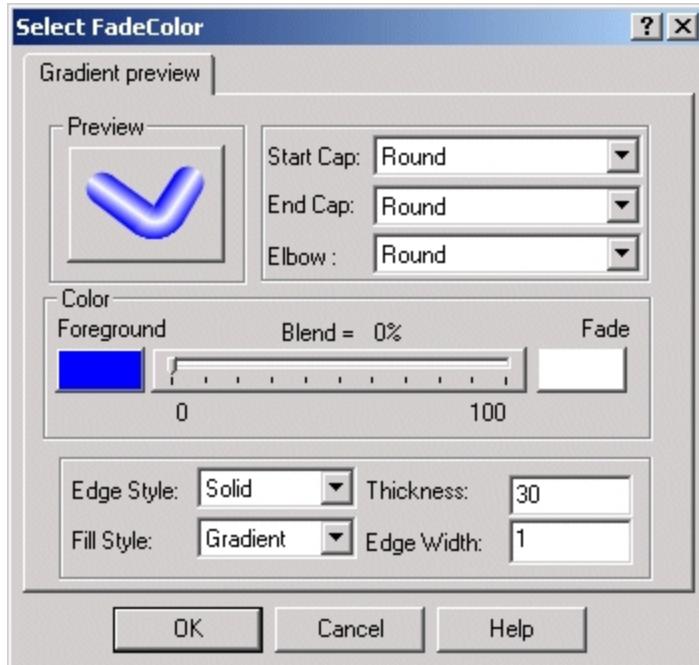
Clicking the Foreground or Fade color buttons opens the Select Color box where you can choose the colors you want to apply to your shape or pipe. For more information about choosing colors for your shapes, refer to [Using the Color Box](#).

When you choose Fade from the Color pop-up menu on a shape object, the Gradient preview tab of the Select FadeColor dialog box appears. The fields on this dialog box allow you to apply gradient fill properties to the object. These fields are available only when you select a single shape object. If you select multiple objects, you can only choose a color from the Select Color dialog box.



**Shape Gradient Preview Dialog Box**

When you choose Fade from the Color pop-up menu on a pipe object, the Gradient preview tab of the Select FadeColor dialog box appears. The fields on this dialog box allow you to apply pipe and gradient fill properties to the pipe object.



**Pipe Gradient Preview Dialog Box**

These dialog boxes offer a central place to apply gradient fill properties rather than making individual changes using the right-click pop-up menu. However, you cannot make gradient fill changes to multiple shape objects.

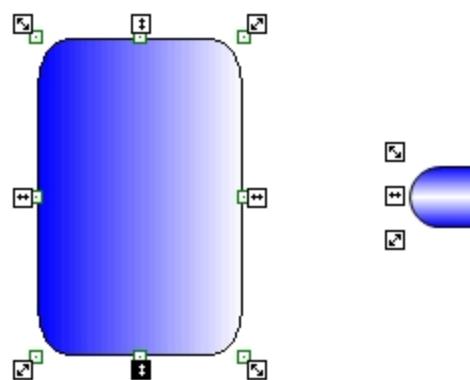
For more information about making changes to multiple pipe objects, refer to [Modifying Pipe Characteristics](#).

The following sections describe the different gradient fill features that you can apply to your shape objects.

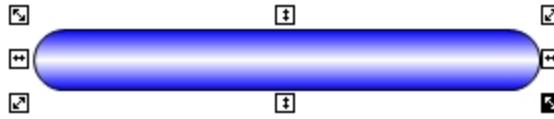
### Fade Type

Fade type blends the fade color with the foreground and background colors to produce the three-dimensional appearance in the shape. You can apply the following fade types to your objects and pictures:

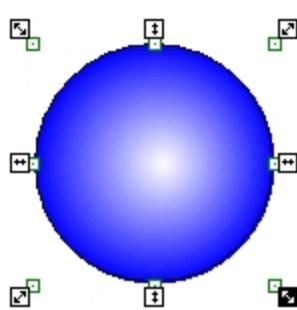
Fade Type	Description
Linear	The foreground color fades to the fade color from one end of the shape to the other.
Reflected	The foreground color converges to the fade color in the center of the shape in a linear fashion.  <b>NOTE:</b> This fade type may not display in long, narrow rectangular shapes.
Radial	The foreground color is darkest around the edges and recedes radially towards the center.
Concentric	The foreground color is darkest along the edges and center with a concentric band of fade color in between.



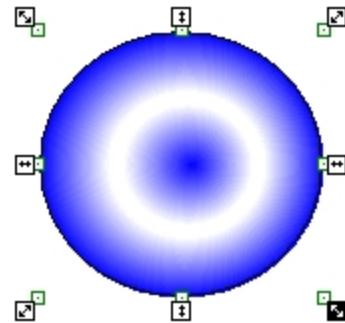
Linear



Reflected



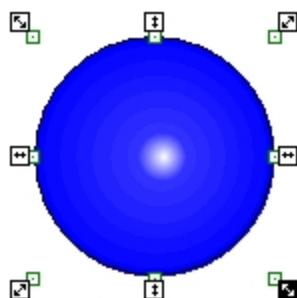
Radial



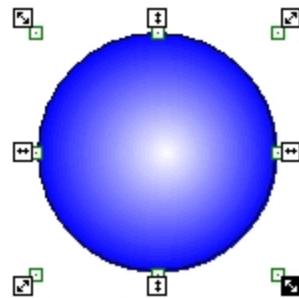
Concentric

#### Blend Percentage of Fade Color

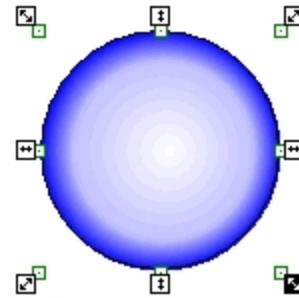
When you use gradient fill, you can change the way colors are mixed to achieve different effects. The blend percentage is the amount of fade color that is applied to the fade type. The higher the percentage, the more fade color is visible. The following diagrams show different blend percentages.



20% Blend



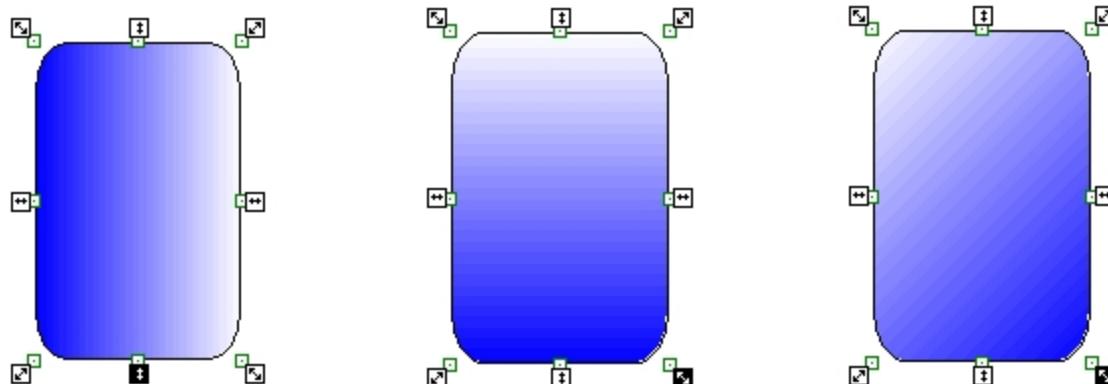
50% Blend



75% Blend

#### Gradient Angle of Fade Color

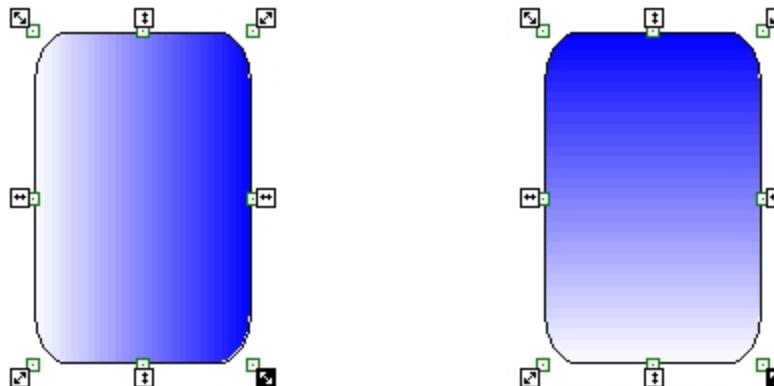
Gradient angle is the angle, in degrees, of the gradient brush. The default gradient angle is 0° and is always on the right side of the shape. You can apply as precise an angle as you need using the Gradient Angle slider.



0° Angle

90° Angle

135° Angle



180° Angle

270° Angle

## Viewing Your Picture in the Run-time Environment

To view a picture, you do not have to leave the application you are in or shut anything down. You can switch environments directly from the WorkSpace with the click of the mouse. To view your picture, use one of the following methods:

- Click the Switch to Run button on the Standard toolbar (Classic view).
- Click Switch to Run in the WorkSpace group on the Home tab (Ribbon view).
- Press CTRL+W on your keyboard.

You can also control other preferences at run-time using the User Preferences dialog box. Refer to the [Using the iFIX WorkSpace](#) chapter of the Understanding iFIX manual for more information on iFIX WorkSpace preferences and on switching environments.

## Upgrading Pictures to Enhanced Coordinates

The Enhanced Coordinate System allows you to upgrade one or more pictures (or Dynamo Sets) created with the Logical Coordinate System.

### IMPORTANT:

It is recommended to upgrade your pictures in groups, verifying the upgrade along the way to ensure that pictures are upgrading in accordance with your expectations. Also, because the upgrade process is resource intensive, it is recommended to refrain from other CPU intensive tasks during the time of upgrade.

When using constant numeric values in scripting for object dimension and position, you may need to edit the script to implement the Enhanced Coordinate System. For more information, refer to the [Upgrading Hard-coded Values in Animations](#) section.

If your iFIX project is configured in a path other than the LOCAL directory in the SCU or if you have multiple SCUs in different locations (for example, Terminal Services or iPower setup), you must upgrade the iFIX default files. When you upgrade from iFIX 5.5 or earlier with this scenario, the listed new Utility toolbar options related to the Enhanced Coordinate System will not appear on your screen or work properly. To fix this situation, first upgrade to iFIX 5.8 and then follow the directions to upgrade the iFIX default files.

**NOTE:** This procedure must be performed for every project.

1. Start the SCU.
2. On the Configure menu, click Paths to open the Path Configuration dialog box to make your changes.
3. Click Change Project. A message box appears asking if you want to generate the default iFIX files to the project.
4. Click Yes and then OK.

### Before You Upgrade the Picture

Prior to upgrading the picture (or Dynamo Set) to the Enhanced Coordinate System, open the picture in the screen resolution in which the picture was created or displayed (with the Logical Coordinate System). Make sure that the picture opens without errors and displays as desired *before* you start the upgrade process. The picture you view on the screen resolution with the Logical Coordinate System is exactly what will be upgraded to the Enhanced Coordinate System; that is, if the picture contains a scaling issue, that issue is converted to the Enhanced Coordinate System. Fix any errors that display when opening the picture or Dynamo Set, such as those for missing references, as this will prevent the picture or Dynamo Set from upgrading successfully. When you are satisfied with the picture, continue with the upgrade process.

#### ► To upgrade a picture:

1. Close all pictures and Dynamo Sets. A warning message appears when a picture or Dynamo Set is open.
2. In Classic view, on the Utilities toolbar, click the Upgrade File to Enhanced Coordinates  icon.

-Or-

In Ribbon view, on the Applications tab, in the Utilities menu, click Upgrade Files to Enhanced Coordinates.

The Upgrade Pictures to Screen Independent Enhanced Coordinates dialog box appears with the Upgrade Files option selected.

A list of eligible files from the default folder displays in the Select Files window depending on the File Type selected.

3. Select the File Type you wish to display in the Select Files window.
4. To display files from a different directory, in the Pictures and Dynamos Set Folder Path window specify the new directory. Then, select the Refresh File List button. You can also browse and select an available folder by using the Browse button followed by the Refresh Files List button.
5. Select the appropriate file(s) you wish to upgrade from the Select Files window. The Upgrade button becomes enabled.
6. Press the Upgrade button. This operation backs up the files selected for upgrading, and then upgrades the files. The upgraded files are removed from the Select Files list when the upgrade is completed.
7. Confirm that the picture was upgraded by using the Properties Window to examine the EnhancedCoordinates property for that picture (where "True" indicates the file was upgraded successfully), or by checking the picture or Dynamo icon in the system tree.

To cancel the upgrade while it is in progress, click the Cancel button. Files that were upgraded remain upgraded. Files that were to be upgraded are not upgraded.

For information on restoring upgraded files, refer to the [Restoring a Picture to the Logical Coordinate System](#) section.

#### **After You Upgrade the Picture**

Make sure all the objects within the picture are located at the right positions and that the picture is a valid size. In some cases, upgraded pictures may contain objects that reside outside of the document extents. After upgrading these pictures, the objects may not display correctly when viewing the picture in Zoom to Fit in the Enhanced Coordinate System. If this occurs, modify the document extents by editing the picture properties DocumentHeightEx and DocumentWidthEx.

The Upgrade File to Enhanced Coordinate expert checks the position of each object in the picture as it is upgraded. When an object resides outside of the document extents, a message is written to the log file, UpgradeCoordinatesLog\_<date time>, which recommends new settings for these properties. The log file resides in the current project's configured Alarm (ALM) folder. A new log file is created each time an upgrade is run.

A sample log file for an upgrade that requires modifications is as follows:

```
2013_8_29 23_14_49 iFIX Enhanced Coordinates Upgrade Expert 5.8.10367.0Copyright(c) 2013, General Electric Company
2013_8_29 23_14_49 Upgrade started Thursday, August 29, 2013 2:14:49 PM.
2013_8_29 23_14_49 Upgrade Picture Path: C:\PROGRAM FILES (X86)\PROFICY\PROFICY IFIX\PIC\
2013_8_29 23_14_49 Some upgraded objects in file TestPicture3 are outside of the new document extents and may no
2013_8_29 23_14_49      Set the value of DocumentHeightEx in the property window to be greater than or equal
2013_8_29 23_14_49      Set the value of DocumentWidthEx in the property window to be greater than or equal
2013_8_29 23_14_52 Upgrade completed Thursday, August 29, 2013 2:14:52 PM. Closing the log file.
```

A sample log file for an upgrade that does not require changes is as follows:

```
2013_8_29 23_20_54 iFIX Enhanced Coordinates Upgrade Expert 5.8.10367.0
Copyright(c) 2013, General Electric Company. All Rights Reserved.
2013_8_29 23_20_54 Upgrade started Thursday, August 29, 2013 2:20:54 PM.
2013_8_29 23_20_54 Upgrade Picture Path: C:\PROGRAM FILES (X86)\PROFICY\PROFICY IFIX\PIC\
2013_8_29 23_20_58 Upgrade completed Thursday, August 29, 2013 2:20:58 PM. Closing the log file.
```

► To verify the picture upgraded correctly:

1. Check the log files to determine if changes need to be made to the picture(s) properties in the Properties window. The log file (UpgradeCoordinatesLog\_201x\_x\_xx\_xx\_xx\_xx) resides in the current project's configured ALM folder. This log file name contains the current date and time when the Upgrade File to Enhanced Coordinate expert was run.
2. Examine the log files to determine if the picture(s) needs to be changed.
3. If necessary, modify the document extents (DocumentHeightEx and DocumentWidthEx) so that window sizes are calculated correctly.
4. Verify that the picture displays correctly.

## Upgrading Hardcoded Values in Animations

Position (horizontal/vertical) and dimension (height/width) properties for an animation within a picture that was upgraded to the Enhanced Coordinate System may not work as expected when you have hardcoded values that are either:

- Used in the Expression Builder for the position and dimensions animation of objects.
- Assigned via scripts for the position and dimensions of objects.

To upgrade the animation to work correctly, you must modify the animation with valid values for the Enhanced Coordinate System.

► To modify the animation, perform one of the following:

- Change the hardcoded value in the Expression Editor to reflect the Enhanced Coordinates value in postscript points.

Place a sample script into the same picture that needs the hardcoded values updated. For example, the following sample script contains a value of 10 for the horizontal position:

```
Private Sub Rect1_Edit()  
MsgBox Me.ConvertToEnhanced Coordinates (10, True)  
EndSub
```

Then, replace the value in the Expression Editor for your animation with the value that displays in the message box.

**NOTE:** The script to derive the Enhanced Coordinate value must be placed under the same picture that requires the edits for the animation.

- Place Me.ConvertToEnhancedCoordinates( ) around the hardcoded value in a script.

For more information, see the example in the [ConvertToEnhancedCoordinates Method Example](#) section in the iFIX Automation Reference e-book.

## Converting Button Captions

The Button Caption Converter allows you to scale one or more button captions (text) in an active picture. When converted, the caption text automatically scales to the resolution of the target screen and sits directly on top of the command button as an overlay.

**NOTE:** If you have a button with long caption strings and a button caption appears in multiple lines with the WordWrap property enabled, edit the button caption by entering a new line (Shift-Enter) where you want the string to wrap. Then, convert the Button Caption. The Button Caption Converter should make the button and text for multiple lines appear as you desire.

### Before you Convert a Button Caption

After you upgrade a picture to use Enhanced Coordinates and before you convert a button caption, make sure all the objects within the picture are located at the right positions and that the picture is a valid size. In some cases, upgraded pictures may contain objects that reside outside of the document extents. After upgrading these pictures to use Enhanced Coordinates, the objects may not display correctly when viewing the picture with Zoom to Fit. If this occurs, modify the document extents by editing the picture properties DocumentHeightEx and DocumentWidthEx. For a description of the DocumentHeightEx and DocumentWidthEx properties, refer to the [DocumentHeightEx](#) and [DocumentWidthEx](#) sections in the [iFIX Automation Reference](#) e-book.

The upgrade expert checks the position of each object in the picture as it is upgraded. When an object resides outside of the document extents, a message is written to the log file, UpgradeCoordinatesLog\_<date time>, which recommends new settings for these properties. The log file resides in the current project's configured Alarms path folder. A new log file is created each time an upgrade is run. For log file examples, see the information in the [Upgrading a Picture to Enhanced Coordinates](#) section.

**IMPORTANT:** If you choose to relocate the command button caption within the picture, you must move both the original command button and the newly created overlay **together**. Otherwise, the exact placement the overlay on top of the command button is lost. If you choose to modify any button property or caption, you must first edit the button object and then convert the button object again.

#### ► To convert a selected button caption:

1. Open the picture that contains the button caption you wish to convert.
2. Select a button object to convert.
3. In Classic view, click on the Convert a Selected Button's Caption icon  in the Utilities toolbar.

-Or-

In Ribbon View, on the Applications tab select the Utilities button. From the Utilities drop-down menu, select Convert a Selected Button's Caption.

The Button Caption is converted and scales to Zoom to Fit view.

4. Verify that the button caption was converted by viewing the graphic with the converted text.

#### ► To convert multiple button captions:

1. Open the picture that contains the button captions you wish to convert.
2. In Classic view, click on the Multiple Button Caption Converter Expert icon  in the Utilities toolbar.

-Or-

In Ribbon View, on the Applications tab select the Utilities button. From the Utilities drop-down menu, select Multiple Button Caption Converter Expert.

The Button Caption Converter dialog box appears. A listing of button captions eligible for conversion display in the "Push button found in picture" dialog box.

3. From the list of eligible objects, select the button object you wish to convert. You can confirm that the button is selected by looking in the picture, or clicking on "Find Next" to confirm the conversion of each button object individually.
4. Click the Convert Button Caption button. The selected button object is converted.
5. Repeat steps 3 and 4, or click 'Convert All' to convert all the button objects.
6. Verify that the button captions were converted by viewing the graphic with the converted text.

**NOTES:**

- When you need to modify the button caption, color, animations, move or delete groups, first edit the button object and then convert the button object.
- The number of buttons selected during the conversion process may impact the picture loading time. For efficient picture loading, it is recommended to minimize the number of button conversions.
- If you want to change the button Foreground and Background color properties from the default, select the color from the system default color selection in the Property Window, or from the Advanced Animation dialog box.
- WordWrap properties are not applied. Instead, you must insert a CR (Shift-Enter) to make a caption to be multiple lines in the button before the conversion.

## Restoring a Picture to the Logical Coordinate System

You can restore an upgraded Enhanced Coordinate System picture to a Logical Coordinate System picture. Prior to upgrading to the Enhanced Coordinate System, pictures are backed-up to a Backup directory for this purpose.

**NOTE:** Make sure the picture file is closed both locally and remotely before you attempt to restore a picture. Picture files that are open in a local or a remote session are not eligible for restoration, and will not display in the Select Files window until the picture is closed.

► **To restore a picture to the Logical Coordinate System:**

1. Close all pictures and Dynamo Sets. A warning message appears when there are files open and need to be closed before you can proceed.
2. In Classic view, on the Utilities toolbar, click the Upgrade File to Enhanced Coordinates  icon.  
-Or-  
In Ribbon view, on the Applications tab, in the Utilities drop-down menu, click Upgrade File to Enhanced Coordinates.
3. Select the Restore Files from Backup option. A list of eligible files from the Backup directory display.
4. To display files in a different directory, specify the new directory in the Pictures and Dynamos Set Folder Path window. Then, select the Refresh File List button. You can also browse and select an alternate folder by using the Browse button followed by the Refresh Files List button.

5. Select the appropriate file(s) from the Select Files window. The Restore Files button becomes enabled.
6. Click the Restore Files button. This restores the file(s) to the Logical Coordinate System. The restored files are removed from the Select Files list when the operation completes.
7. Confirm that the picture was restored by using the Property Window to examine the EnhancedCoordinates property for the picture. (False - indicates the file was restored to the Logical Coordinate System successfully.)

## Selecting Zoom to Fit

Zoom to Fit is an Enhanced Coordinate System option that automatically resizes the picture area to fit the entire window and also suppresses scroll bars. The Zoom to Fit option is only for viewing pictures and does not allow you to edit the picture.

### NOTES:

- When using Zoom to Fit in Configuration mode, edits to the file are disabled and grids are also disabled.
- When using Zoom to Fit on a picture with a lower resolution that was converted to the Enhanced Coordinate System, be sure to verify that all the objects are visible. Check the height and width of the picture in run mode. If all the objects are not visible, change the height and width of the picture to see all the objects. Then, Save the picture. By default Zoom to Fit is enabled in run mode. To disable Zoom to Fit, press Ctrl+M. All objects should appear in the picture.

### ► To select Zoom to Fit to view a picture:

1. Open the picture you want to use for Zoom to Fit.
  2. In Classic view, select the Windows menu and then Zoom to Fit – or press Ctrl+M.  
-Or-  
In Ribbon view, on the View tab and in the Zoom group, click Zoom to Fit – or press Ctrl+M.
  3. The Workspace displays a message box to inform you that:
    - Zoom to Fit is view only and edits are disabled.
    - Turn Zoom to Fit off (Ctrl+M) to enable editing.
- The picture automatically scales to fit the entire window and suppresses the scroll bars.
- A small toolbar appears, which you can select to close Zoom to Fit, or you can enter Ctrl+M to toggle Zoom to Fit.

## Performing Advanced Functions in Pictures

iFIX gives you complete control of your pictures by allowing you to easily perform advanced procedures. The sections that follow introduce some of the functions that are available, many of which are accessible from the picture pop-up menu. The [Implementing Pictures in Your Process](#) chapter expands on these concepts and details additional features for controlling how your pictures look.

- [Sharing Picture Files](#)
- [Replacing a Picture](#)
- [Changing the Picture View](#)
- [Tiling and Cascading Pictures](#)
- [Creating Pictures without Title bars](#)

## Sharing Picture Files

iFIX lets you share picture files so that other users can access pictures on a different system. You can do this by placing the files on a file server and sharing a path. For more information on sharing files, refer to the [Sharing Files](#) section in the Understanding iFIX manual.

## Replacing a Picture

To replace a picture with another picture, use the Replace Picture Expert, located on the Experts toolbar (Classic view) or on the Tools tab, in the Tasks/Experts area, click Tasks/Experts (Ribbon view). This Expert allows you to close a picture and replace it with another picture in both the configuration and run-time environments. If desired, you can specify an alias to the picture that is automatically assigned as the new picture name. For more information on Experts, refer to the [Using Process Assistants to Expedite Pictures](#) chapter.

## Changing the Picture View

By giving you control of the window, iFIX makes it easy to change a picture's magnification. There are several different views you can create using the picture pop-up menu. These include:

- Zoom
- Default View
- Full View
- Fit Picture to Window
- Fit Window to Picture
- Zoom to Fit

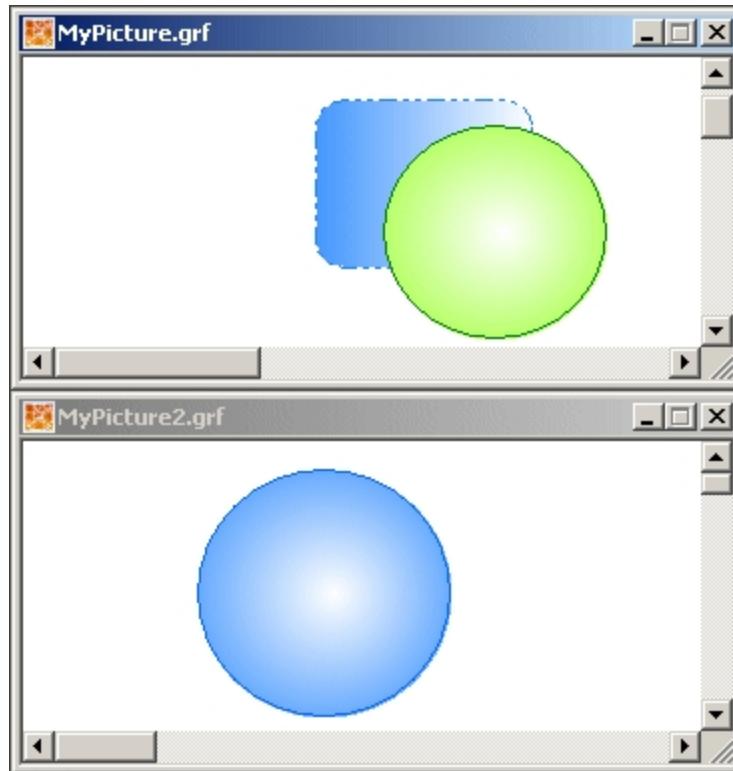
Refer to the [Controlling a Picture's Magnification](#) section for more information on specifying viewing options.

## Tiling and Cascading Pictures

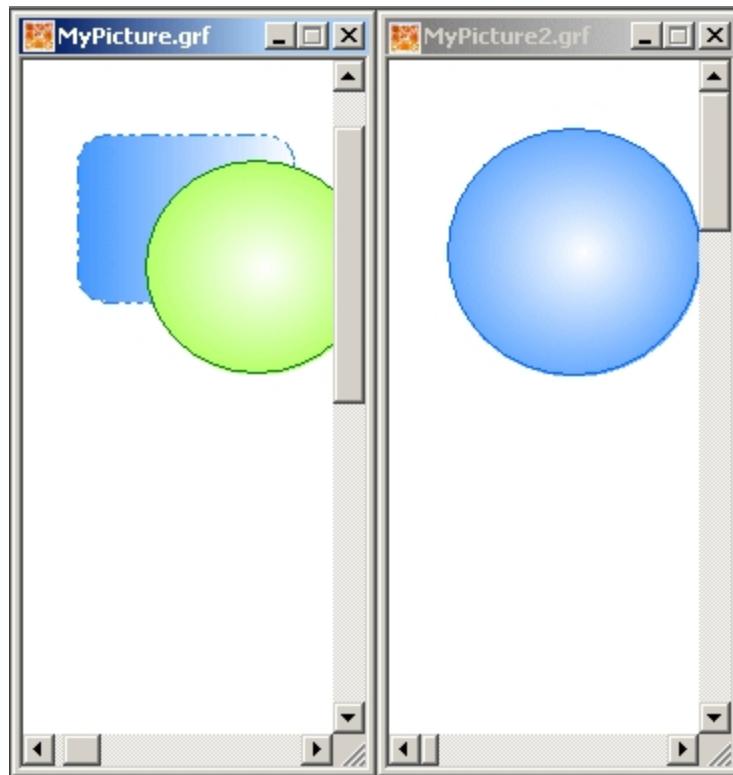
As you create and modify pictures, you may want to have several pictures open at once. Depending on the size and position of the pictures opened, this can result in one or more pictures hidden behind the top picture. Although you can use the Show function to switch from one to another, or manually move or resize a picture, you may want to view more than one at a time. A fast, easy way to arrange multiple

pictures is to tile or cascade them using the Window menu. (Both Tile and Cascade are found on the View tab in ribbon view.)

When you tile two or more pictures, iFIX arranges each picture so that they do not overlap and resizes each window so that all the pictures fit in the available client area. You can tile pictures horizontally or vertically. To do this select Tile Horizontal or Tile Vertical from the Window menu. Both methods of tiling are shown in the following figures.



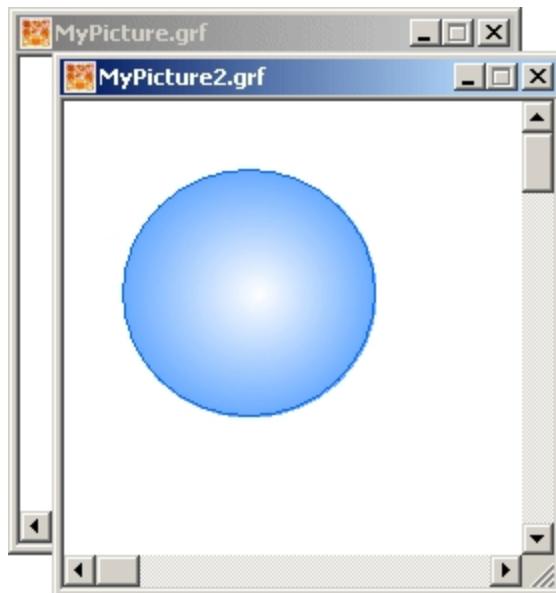
*Tiling Horizontally*



#### *Tiling Vertically*

You can open as many pictures as you want, limited only by the amount of memory in your computer.

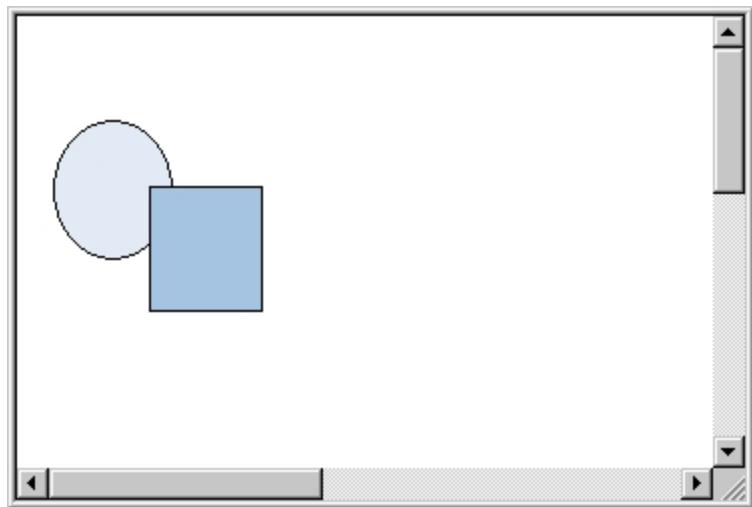
When you cascade two or more pictures, the pictures are staggered and resized equally so that you can select each picture by its title bar. This is illustrated in the following figure. To cascade pictures, select Cascade from the Window menu.



#### *Cascading Pictures*

## Creating Pictures without Title bars

You can also create pictures with no title bars. This is a particularly helpful feature when you want to view your pictures *as is* in your operator display. The following figure illustrates a picture without a title bar.



*Picture without a Title bar*

You cannot tile or cascade a picture without a title bar.

If you want to create a full screen picture without a title bar make sure that you deselect the Title bar check box.

► **To create a full screen picture without a title bar:**

1. In Classic view, on the WorkSpace menu, click User Preferences.

-Or-

In Ribbon view, on the Home tab, in the WorkSpace group, click Settings, and then click User Preferences.

2. Click the Picture Preferences tab.
3. Deselect the Titlebar check box.
4. Click OK.

**NOTE:** If you intend to autoscale pictures created without titlebars, the picture must be started titleless.

There are many additional style options for the picture window. For more information on these window properties, refer to the [Planning Your Pictures](#) section.

## Overview Checklist

The list below describes the tasks to create a picture.

► **To create a picture:**

1. In Classic view, on the Standard toolbar, click the New Picture button.

-Or-

In Ribbon view, click the WorkSpace button, select New, and then click Picture.

2. Using the Shapes toolbar, add objects to the picture. In Ribbon view you may also add objects from the Insert tab from the Shapes group. If you want to use a pre-configured object, add a Dynamo. If you want to attach a script to the object, run an Expert.
3. Using the Animations dialog box, modify or animate the object's properties.
4. If desired, write an event-based script for your pictures and objects.
5. In Classic view, on the WorkSpace menu, click Switch to Run to view your picture in the run-time environment.

-Or-

In Ribbon view, from the Home tab, in the WorkSpace group, click Switch to Run.

6. In Classic view, on the WorkSpace menu, click Switch to Configure to switch back to the configuration environment.

-Or-

In Ribbon view, from the Home tab, in the WorkSpace group, click Switch to Configure.

## How Do I...

In the iFIX WorkSpace, you can perform the following steps with pictures:

- [Changing Your Window Size](#)
- [Setting the Fade Type of a Picture](#)
- [Setting the Gradient Angle of a Picture's Fade Type](#)
- [Zooming In and Out of Pictures](#)
- [Updating the Window Location](#)
- [View All Thumbnails](#)
- [Enabling or Disabling Window Properties](#)
- [Resolving Pictures](#)
- [Saving Thumbnails for Previously Created Pictures or Dynamo Sets](#)
- [Importing Windows Metafiles](#)
- [Assigning Pictures to a Security Area](#)
- [Defining the Attributes of a Custom Picture](#)
- [Using Specified Dimensions](#)
- [Modifying Picture Properties](#)
- [Using the Dimensions of an Existing Picture](#)
- [Setting the Options on the WorkSpace Appearance Page](#)
- [Tracking Cursor Coordinates](#)
- [Using the Grid](#)

- [Upgrade Pictures to the Enhanced Coordinate System](#)
- [Convert Button Captions](#)
- [Restore Pictures to the Logical Coordinate System](#)

## Changing Your Window Size

The window size is always defined as a percentage of the screen. By sizing a window by the percentage of the screen, iFIX scales your picture while maintaining its coordinate system and displays the picture with its original aspects regardless of the monitor's resolution on which it is viewed. Both the Window Width and Window Height must be within 0-100 percent.

► **To change your window size:**

1. In Classic view, in the iFIX WorkSpace, on the Edit menu, click Picture.  
-Or-
- In Ribbon view, on the Home tab, in the Editing group, click Properties, and then click Picture.
2. In the Window Width field, enter a picture width as a percentage.

**NOTE:** Be careful when entering a percentage as its meaning is different for each coordinate system. For more information on percentages for both coordinate systems, refer to the [Controlling a Picture's Magnification section](#).

3. In the Window Height field, enter a picture height as a percentage.
4. Click the Apply button to view the change.
5. Continue to adjust the percentages and apply the changes until you have the picture as you want it to be.
6. Click the OK button to save the window settings.

## Setting the Fade Type of a Picture

► **To set the fade type of a picture:**

1. In Classic view, in the iFIX WorkSpace, on the Edit menu, click Picture.  
-Or-
- In Ribbon view, on the Home tab, in the Editing group, click Properties, and then click Picture.
2. Select the Gradient enabled check box and then select the fade type you want to apply to the gradient.

**NOTE:** The Gradient enabled check box is automatically selected in this dialog box if it has been selected in the Picture Preferences tab of the User Preferences dialog box.

## Setting the Gradient Angle of a Picture's Fade Type

► To set the gradient angle of a picture's fade type:

1. In Classic view, in the iFIX WorkSpace, on the Edit menu, click Picture.

-Or-

In Ribbon view, on the Home tab, in the Editing group, click Properties, and then click Picture.

2. Select the Gradient enabled check box and then select the fade type you want to apply to the gradient.
3. Move the Gradient Angle slider to the angle you want applied to the fade type.

## Zooming In and Out of Pictures

► To zoom in and out of a picture:

1. In the iFIX WorkSpace, right-click any area in the picture outside of an object, point to Zoom and choose the desired magnification.
2. To zoom out, repeat step 1.

## Updating the Window Location

► To update the window location:

1. In the iFIX WorkSpace, adjust the picture window size and location.
2. Right-click any area in the picture outside of an object and choose Update Window Location.
3. Save the picture. When you open the picture later, or switch back to the configuration environment after viewing it at run-time, the picture will appear with the same size and location you set in step 1.

## Viewing all Picture and Dynamo Set Thumbnails at Once

► To view all picture and Dynamo set thumbnails at once:

1. In Classic view, in the iFIX WorkSpace, on the Standard toolbar, click the Open Picture Folder button.

-Or-

In Ribbon view, on the Home tab, in the WorkSpace group click Open Picture Folder.

2. Select the folder that contains your iFIX pictures.

**NOTE:** The PIC folder is the default folder location.

3. Click OK. A window opens that displays thumbnails, if they exist, for all pictures and dynamo sets.

## Enabling or Disabling Window Properties

► **To enable or disable a window property:**

1. In Classic view, in the iFIX WorkSpace, on the Edit menu, click Picture.  
-Or-  
In Ribbon view, on the Home tab, in the Editing group, click Properties, and then click Picture.
2. Select or clear one or more check boxes corresponding to the window properties you want to enable or disable.

## Resolving Pictures

► **To resolve a picture:**

1. In Classic view, in the iFIX WorkSpace, on the Utilities toolbar, click the Resolve Files button.  
-Or-  
In Ribbon view, on the Application tab, in the Utilities group, click Utilities, and then click Resolve Files.
2. In the File Types area, select the Pictures check box.
3. In the Directories area, verify that your picture directory is correct. If not, enter the correct path in the Pictures field.
4. In the Resolve Files area, select the picture file you want to resolve. To select every file in the list, click Select All.
5. Click the Update Picture Files button.

## Saving Thumbnails with Previously Created Pictures or Dynamo Sets

► **To save thumbnails with a picture or Dynamo set:**

1. In Classic view, the iFIX WorkSpace, on the Utilities toolbar, click the Save Files With Thumbnail Preference button.  
-Or-  
In Ribbon view, on the Application tab, in the Utilities group, click Utilities, and then click Save Files With Thumbnail Preference.
2. In the File Types area, select the Pictures and/or Dynamo Sets check box.
3. In the Directories area, verify that your directory is correct. If not, enter the correct path in the directory field.
4. In the Save Files With area, select the picture or dynamo file you want to save. To select every file in the list, click Select All.
5. Click OK.

## Importing Windows Metafiles

► **To import a Windows Metafile:**

1. In Classic view, in the iFIX WorkSpace, from the Insert menu, select Bitmap.  
-Or-  
In Ribbon View, on the Insert tab, in the Objects/Links group, click Objects Links, and then click Bitmap.
2. In the Files of type field, select Win Metafile (\*.wmf) and select the folder where the file resides.
3. Click Open.

**TIP:** If you want to insert a Windows Metafile (WMF) as a grouped object and not as a flat Bitmap, do not import it directly. Instead, insert the WMF picture into Microsoft Excel using the Insert menu. Right-click the picture and select Edit Picture. A message box appears requesting that you convert the picture to a Microsoft drawing object. Click Yes, and then copy the converted object from Excel. In the iFIX WorkSpace, and select Paste > Paste Special. From the Paste Special dialog box, select Enhanced Metafile and click OK. The grouped object should now appear in your picture.

## Assigning Pictures to a Security Area

► **To assign a picture to a security area:**

1. In the iFIX WorkSpace, open the picture you want to modify.
2. In Classic view, from the View menu, select Property Window.  
-Or-  
In Ribbon view, on the View tab, in the Window group, click Properties.
3. In the Security Area field, enter the security area you want to use.

## Using the Grid

In the iFIX WorkSpace, you can perform the following steps with the grid feature:

- [Displaying the Grid](#)
- [Disabling the Grid](#)
- [Snapping an Object to a Grid Point](#)
- [Changing the Grid Spacing](#)
- [Enabling Grids for All Future Pictures](#)

### Displaying the Grid

► **To display the grid:**

1. In Classic view, in the iFIX WorkSpace, on the Format menu, select Grid Settings.

-Or-

In Ribbon View, on the Format tab, in the Arrange group, click Grid, and then click Grid Settings.

2. Select the Show the Grid check box and click OK.

## Disabling the Grid

► To disable the grid:

1. In Classic view, in the iFIX WorkSpace, on the Format menu, select Grid Settings.

-Or-

In Ribbon View, on the Format tab, in the Arrange group, click Grid, and then click Grid Settings.

2. Clear the Show the Grid check box and click OK.

## Snapping an Object to a Grid Point

► To snap an object to a grid point:

1. In the iFIX WorkSpace, select the object(s) you want to snap to a grid point.
2. In Classic view, on the Format menu, select Snap Objects to Grid.

-Or-

In Ribbon view, on the Format tab, in the Arrange group, click Grid, and then click Snap Objects to Grid.

## Changing the Grid Spacing

► To change the spacing of the grid:

1. In Classic view, in the iFIX WorkSpace, on the Format menu, select Grid Settings.

-Or-

In Ribbon View, on the Format tab, in the Arrange group, click Grid, and then click Grid Settings.

2. In the Grid Interval field, enter the desired spacing for the grid, in pixels.

## Enabling Grids for All Future Pictures

► To enable grids for all future pictures:

1. In Classic view, on the WorkSpace menu, select User Preferences and click the Picture Preferences tab.

-Or-

In Ribbon view, on the Home tab, in the WorkSpace group, click Settings, and then click User Preferences.

2. In the Window Properties area, select the Grid Enabled check box.
3. In the Properties area, enter a value in the Grid Interval field. The value must be entered in pixels.

**NOTES:**

- When zooming in and out of pictures, grids may not appear in the picture properly.
- When using Zoom to Fit in Configuration mode, grids are disabled.

# Implementing Pictures in Your Process

This chapter presents several picture development strategies using iFIX. Included in the chapter are ways to plan, develop, and use pictures to satisfy process requirements, and design tips to help you take full advantage of iFIX. The chapter begins with a comprehensive discussion of how pictures are constructed.

- [What Makes Up Your Picture](#)
- [Planning Your Pictures](#)
- [Designing Your Pictures](#)
- [Using the Create Picture Wizard](#)
- [Working with Other Applications](#)
- [Optimizing Picture Performance](#)
- [Using Picture Caching](#)
- [Making Changes to Pictures at Runtime](#)

To expedite the process of creating pictures and groups of pictures, you can use the Create Picture wizard. This wizard allows you to configure the size, location, and properties of your pictures. You can also use and create predefined configurations of pictures. For more information on the Create Picture wizard, refer to the [Using the Create Picture Wizard](#) section.

## What Makes Up Your Picture

A picture consists of the following components:

- [Document](#)
- [Viewport](#)
- [Window](#)

### The Document

A picture is a document object. When you open a new picture in iFIX, you create a document. The document is the ActiveX container for your iFIX picture. Look at the document as the entire landscape of your picture. The document is created using either the Logical or Enhanced Coordinate Systems. Only pictures created in releases earlier than iFIX 5.8 use the Logical Coordinate system. Pictures created in iFIX 5.8 or later, or pictures from earlier releases that have been upgraded will use Enhanced Coordinates.

#### Logical Coordinate System

To understand what this means, let's go back to the discussion of object-oriented graphics in the *Getting Started* section. This section discussed how iFIX uses object-oriented, rather than pixel-based, graphics. The iFIX picture sizing methodology works in a similar way. A Logical Coordinate System picture size means that your document size is based on logical units, not pixels. The number of this unit of measurement is arbitrary; that is, you can use any number of logical units you want. iFIX makes this

possible by calculating a one-to-one relationship between the pixel size of your monitor and the logical units of your document, while maintaining the dpi (dots per inch) ratio of your monitor.

For example, a standard VGA monitor consists of 640x480 pixels. In iFIX, the default size of your picture, viewed with this monitor, is not 640x480. Rather, it is 100x75 (logical units), as illustrated in the following calculation.

$$\frac{640}{480} \text{ VGA Monitor} = \frac{100}{75} \text{ Logical Units} = \frac{4}{3} \text{ DPI Ratio}$$

### Autoscaling

An iFIX document that uses the Logical Coordinate System establishes the logical-units-to-pixels ratio when you create a new picture, and automatically adjusts the ratio when you change the resolution of your screen. This way, your picture appears to scale no matter what monitor you view it on. When you make any changes to the document, viewport, or window size, iFIX maintains the 4:3 ratio so that your objects maintain a consistent size on your screen.

### Enhanced Coordinate System

With the Enhanced Coordinate System, your document size is based on postscript points, not logical units. The number of this unit of measurement is arbitrary; that is, you can use any number of postscript points you want.

Since the document size is based on the resolution of the screen on which the picture is created, you are recommended to develop a document using the screen resolution of the monitor on which the picture is to be viewed when implemented. (For example, to create a document for a screen with 1920x1080 resolution, you must create your pictures using a computer with a screen resolution of 1920x1080.)

Once created, the document size and shape remains constant when used on a screen with a different resolution.

In addition, iFIX allows you to upgrade documents created with the Logical Coordinate System to the Enhanced Coordinate System while maintaining a backup copy of the original document.

### Zoom to Fit

Zoom to Fit is an Enhanced Coordinate System viewing option. The Zoom to Fit feature automatically scales the document view to fit the current window while suppressing scroll bars.

## The Viewport

The viewport is the mapping system for the Logical Coordinate System document. Like the document, it reads the picture's logical coordinates to determine its size, and then maps the logical coordinates onto the window.

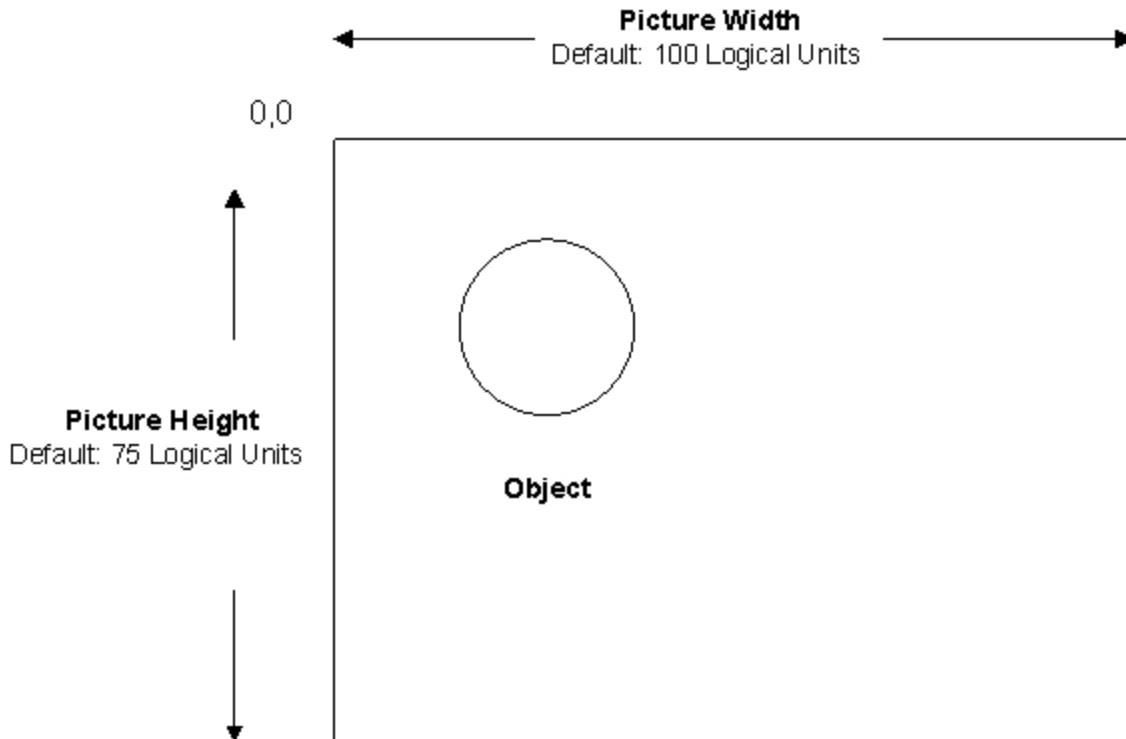
**NOTE:** The Viewport mapping does not apply to pictures that use the Enhanced Coordinate System.

**CAUTION:** If you resize a picture, then modify the viewport width or height (ViewPortHeight and ViewPortWidth properties), the picture's Logical Coordinate System is remapped. When this happens, objects in your pictures may appear skewed when resizing or autoscaling. If you are using custom scripts to manipulate these properties, these scripts become obsolete after an upgrade to the Enhanced Coordinates System. To avoid this problem, it is recommended that you either:

- Do not modify the viewport height or width once you have resized a picture using the Logical Coordinate System.
- Upgrade the picture to the Enhanced Coordinate System.

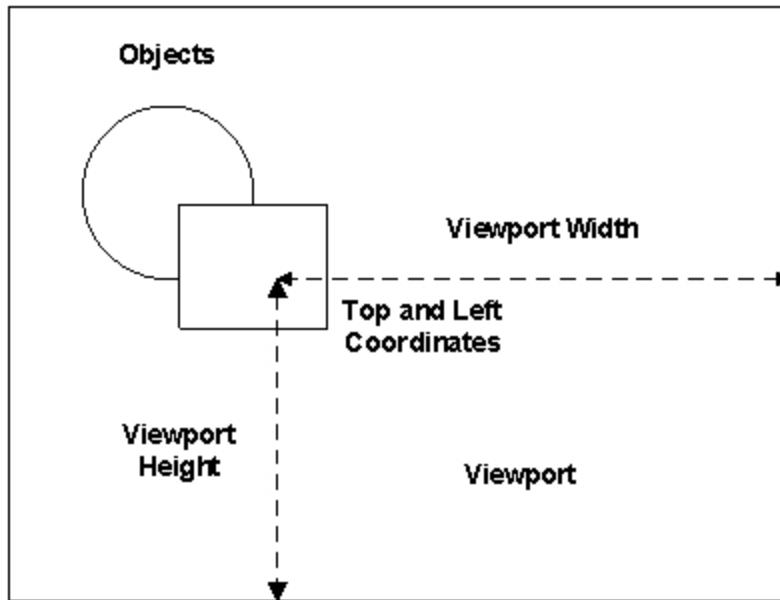
### Logical Coordinate System Example

For example, when using a picture with a width of 100 logical units (or postscript points) and a height of 75 logical units (or postscript points) maintains a logical ratio with coordinates 0, 0 at the top left corner of the picture. This is illustrated in the following diagram.

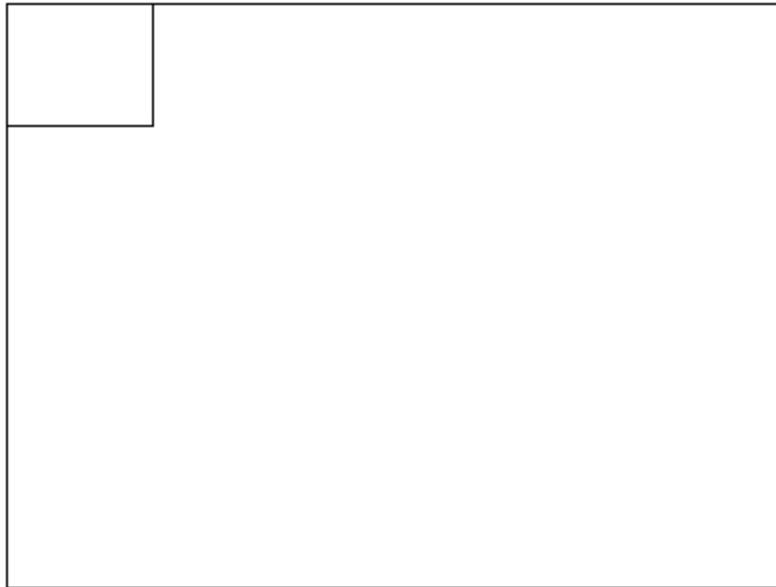


*The Logical Coordinate System*

Look at the viewport as the lens of a camera. For example, if you have a picture containing a circle and a rectangle, and you define the viewport to begin as shown in the following picture:



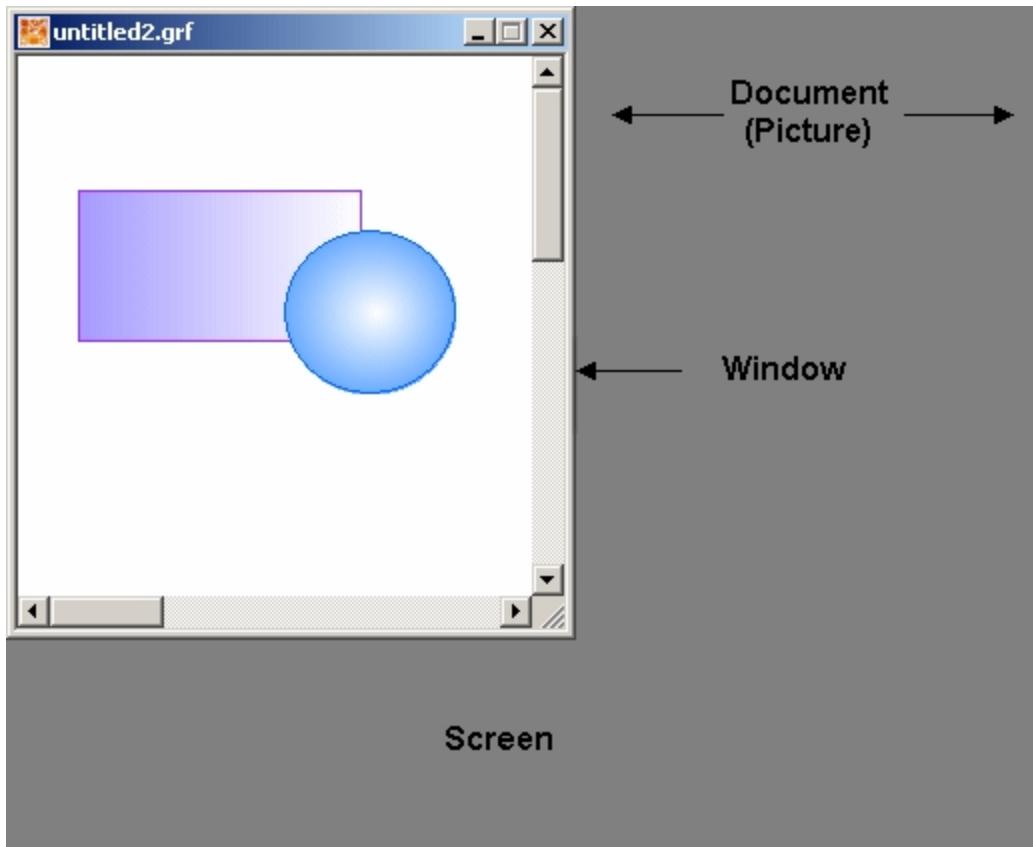
Then the picture will be displayed as shown in the following figure:



## The Window

The window is the available screen area of the document; it sets the boundaries for what you can display in your picture. The window preserves a portion of the screen for various window decorations, such as title bars and sizing borders, for displaying your picture. If the document is the landscape, and the viewport is the camera lens, than the window is the viewfinder; it is what you actually see on the screen. For more information on window decorations, refer to the [Selecting Window Properties](#) section.

The following figure shows the relationship between the window and screen in an iFIX picture.



*The Window and Screen in an iFIX Document*

## Planning Your Pictures

To prepare your development strategy, you must first plan the size of your window, the area of your screen that contains your picture. The sections that follow describe how to custom-design your window so that your pictures look the way you want them to.

- [Determining a Window Size](#)
- [Tips: Sizing and Locating a Picture](#)
- [Controlling a Picture's Magnification](#)
- [Selecting Window Properties](#)
- [Selecting Additional Picture Properties](#)

### Determining a Window Size

When adjusting your picture size, you work with the window property, and you define the size as a percentage of screen:

- Full Screen
- 1/2 Screen Height
- 1/2 Screen Width
- 1/4 Screen

By sizing a window by the percentage of the screen, iFIX scales your picture, maintaining its coordinate system and displaying the picture at its original aspects regardless of the monitor resolution it is viewed on.

The default window and document properties are displayed in the Picture Preferences tab of the User Preferences dialog box. These properties are applied when you create a new picture. The new picture's viewport is automatically set to display the maximum viewable amount of your picture at a 100% zoom ratio. For more information on zooming, refer to the [Controlling a Picture's Magnification](#) section.

To change the size of your window for all new pictures to be created, select a window size in the Window Size field.

### **Logical Coordinate System**

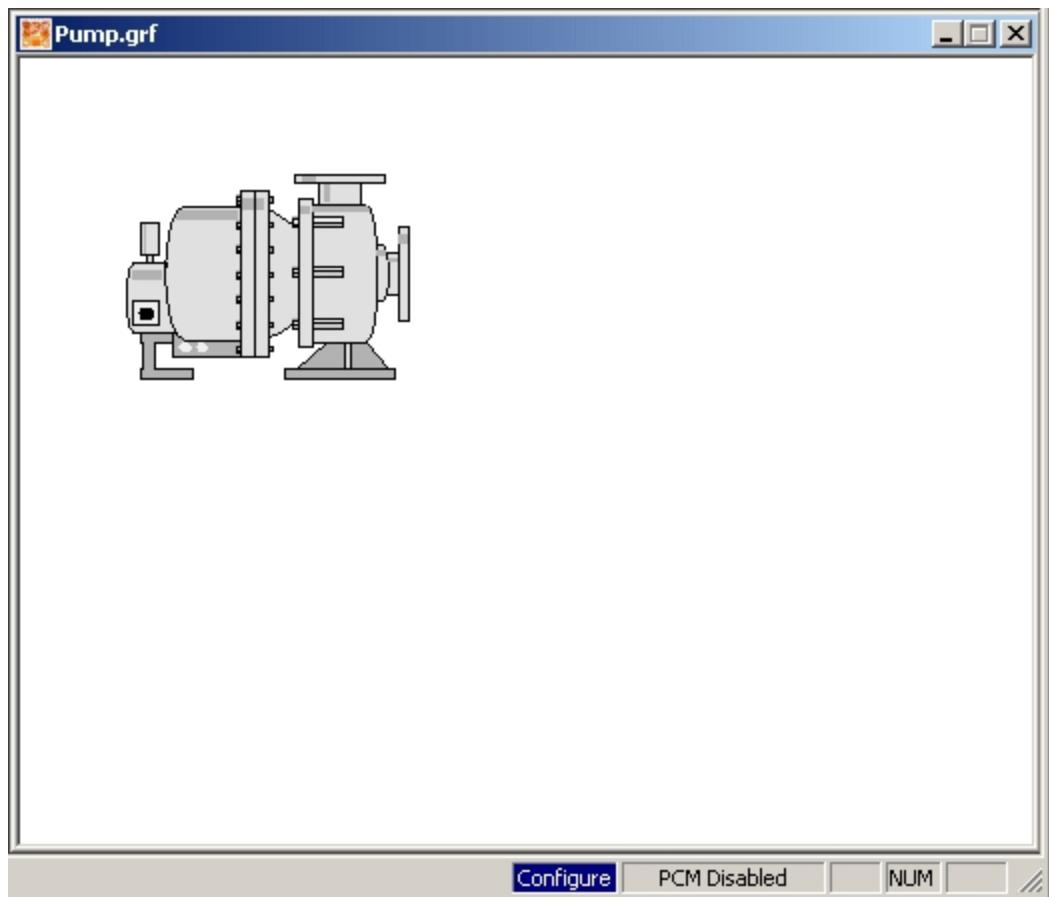
For the Logical Coordinate System, when you want to modify the default document width or height (100 x 75), make sure that the ratio between the width and height remains at 4:3. You can select any units you want; however, if you choose not to maintain the 4:3 ratio, objects with an identical width and height do not appear as such in the window. For more information on the logical-units-to-pixels ratio, refer to the section, [The Document](#).

### **Enhanced Coordinate System**

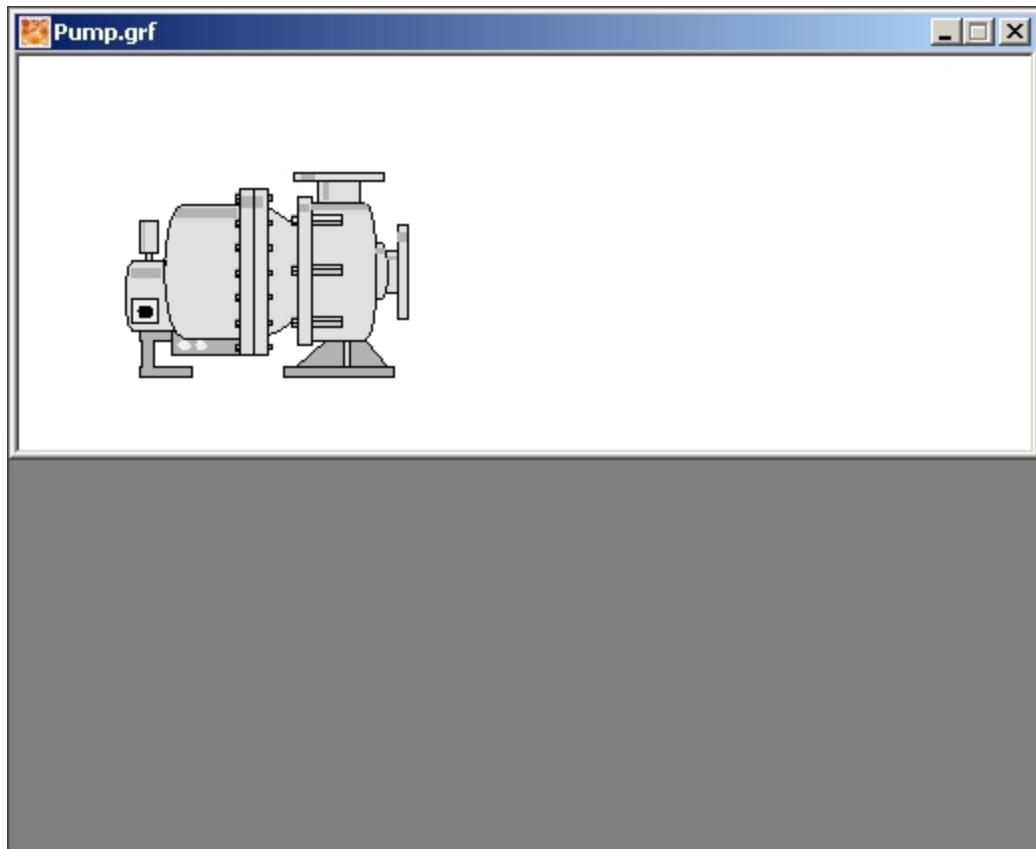
For the Enhanced Coordinate System, the document width and height is calculated in postscript points. When determining a window size, it is important to use the resolution on the computer where the pictures are intended to be viewed. For example, you might create a picture for viewing on a high-definition computer with a resolution of 1920 x 1080, which assumes a wide screen aspect ratio of 16:9.

Once you create a picture, you can change its size by changing the percentage of the Window Height and Window Width properties in the Edit Picture dialog box. In the Edit Picture dialog box, you can specify the desired percentage to represent the size your picture. iFIX automatically preserves the size of the objects on the screen.

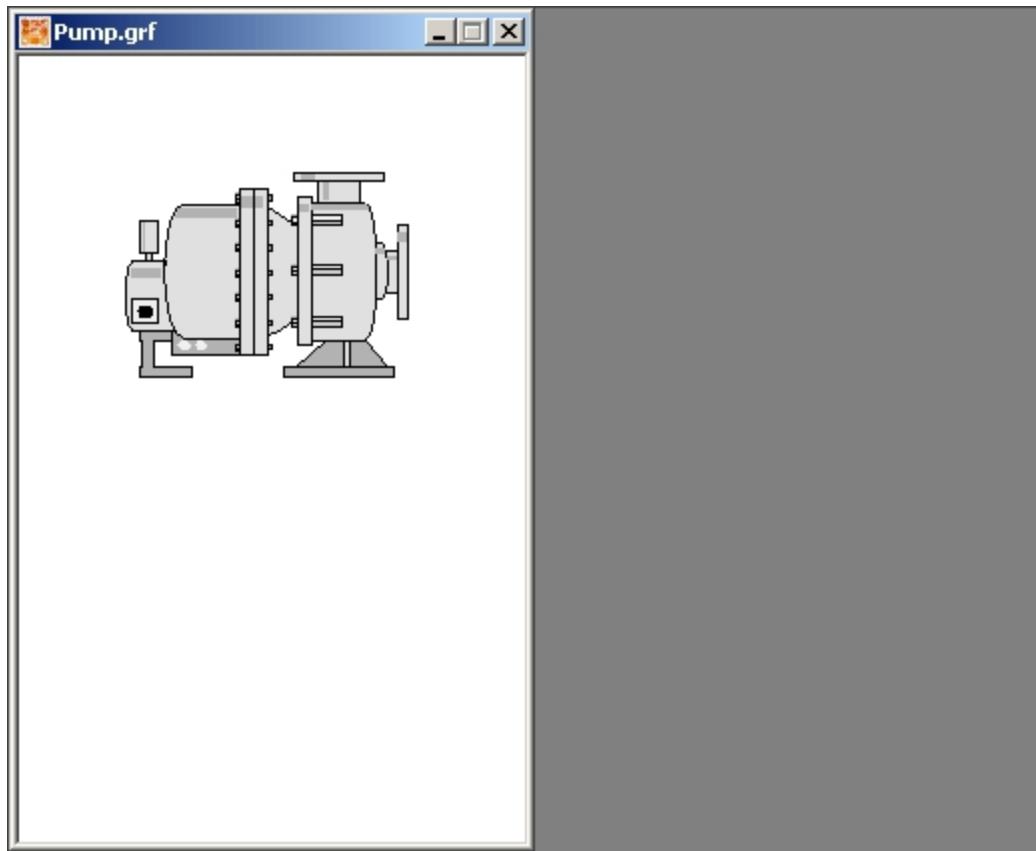
You can have a window that is full screen, half the height of your screen, half the width of the screen, or one quarter of the screen's size. These sizes are illustrated in the following figures.



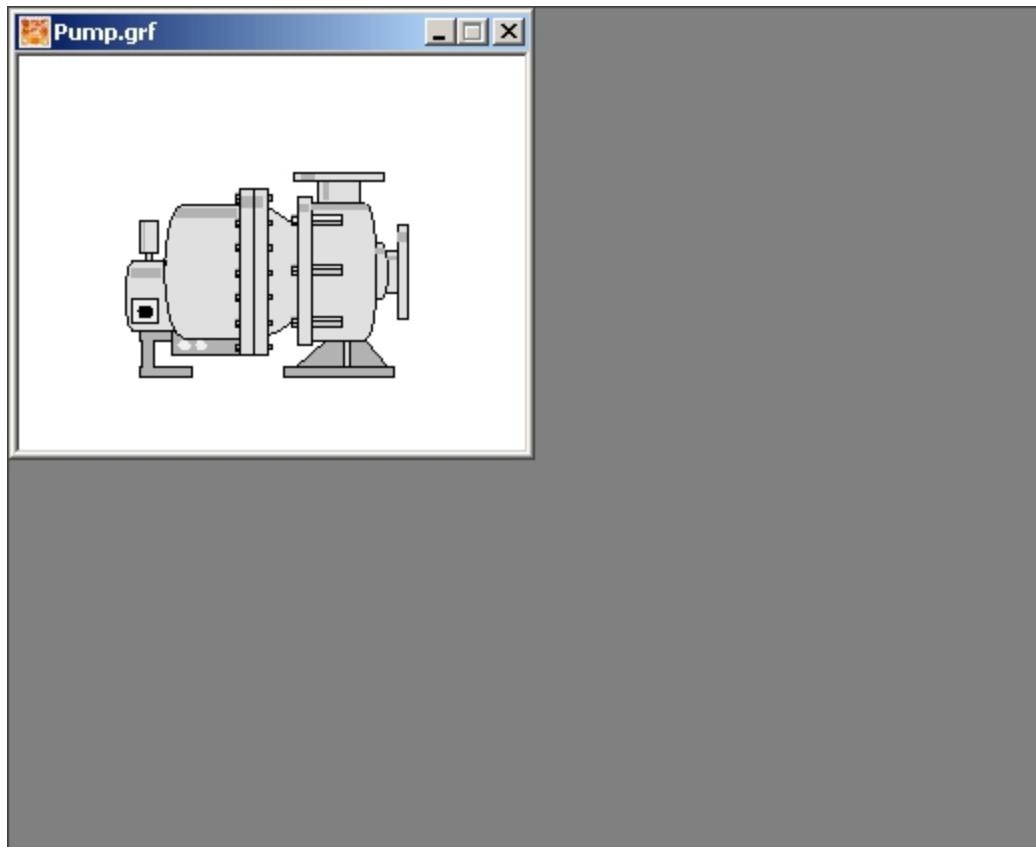
*Full Screen Window Size*



*Half Screen Height Window Size*



*Half Screen Width Window Size*



#### *Quarter Screen Window Size*

#### **Manually Changing the Picture Size of a Logical Coordinate System Picture**

By manually adjusting the size of the window, you can quickly change the view of your picture, when you use the Logical coordinate System.

Before you attempt to adjust the size, make sure you know what document components you are changing in the picture. The following table shows what key sequences or mouse actions that change your picture size, and what part of the document you actually modify.

**NOTE:** The key sequences apply only to pictures that use the Logical Coordinate System. They do not apply to pictures that use the Enhanced Coordinate System.

#### **Key Sequences That Change the Picture Size of a Logical Coordinate System Picture**

Pressing the key sequence...	While... Clicking and dragging the mouse on an edge of the window Clicking and dragging the mouse on an edge of the window Clicking an arrow on the scroll bar	Does the following... Adjusts the size of the picture Adjusts the size of the picture Scrolls the picture	And changes... The window and the viewport. The window. The viewport.
Shift	Clicking and dragging the mouse on an edge of the window	Adjusts the size of the picture	The window and the viewport.
Ctrl+Shift	Clicking and dragging the mouse on an edge of the window	Adjusts the size of the picture	The window.
None	Clicking an arrow on the scroll bar	Scrolls the picture	The viewport.

#### **Tips: Sizing and Locating a Picture**

The way that a picture appears in Run mode can be very different from the way it appears in Configure mode, especially if the WorkSpace will not be full screen in Run mode. Before you create a picture, use the following tips in Configure mode to coordinate the appearances of the picture in configure mode and in run mode:

- If you will be using the WorkSpace full screen in Run mode, maximize the WorkSpace in Configure mode in Classic view by selecting Full Screen from the WorkSpace menu. To maximize the WorkSpace in Configure mode in Ribbon view, on the Home tab, in the WorkSpace group, click Full Screen.
- Float or hide toolbars. To modify settings for toolbars, in Classic view, select the Toolbars option from the WorkSpace menu. In Ribbon view, on the Home tab, in the WorkSpace group, click Settings and then click Toolbars.
- Float or hide the system tree. To toggle the display of the system tree, in Classic view, select System Tree from the WorkSpace menu. In Ribbon view, on the Home tab, in the WorkSpace group, click Show/Hide and then click System Tree.
- Set the Windows taskbar to appear the same as when iFIX is in the run-time environment. To toggle the display of the Windows taskbar, click the right mouse button in the taskbar and select Properties.

**TIP:** For Ribbon view, to ensure access to the taskbar, after you set the toggle property, minimize and then maximize the WorkSpace.

- Set the Status bar to the same appearance as when iFIX is in the run-time environment. To toggle the display of the status bar, in Classic view, select Status Bar from the WorkSpace menu. In Ribbon view, on the Home tab, in the WorkSpace group, click Show/Hide and then click Status Bar.
- Use Zoom to Fit to suppress scroll bars and view the entire graphic of pictures created with or upgraded to the Enhanced Coordinate System.
- When creating new pictures with the Enhanced Coordinate System, consider the following recommendations:
  - Develop pictures on the screen resolutions where they are to be viewed.
  - When there are multiple display resolutions on the target devices, it is recommended to develop those pictures using the minimum resolution at which they will be displayed.
  - Mobile devices require you to develop separate pictures designed specifically for the mobile displays.

If you set Run-time Environment Protection to disable the title bar or the menu bar, you will not be able to set up Configuration mode to appear exactly as it would in run mode. To set run-time protection, access the Environment Protection Preferences tab in the User Preferences dialog box.

When you open an existing picture in run mode, the picture will adjust to the WorkSpace run-time Environment Protection preferences and settings that are currently enabled.

## Controlling a Picture's Magnification

iFIX gives you many ways to change the appearance of your picture on screen or, conversely, keep it looking exactly the same so you don't lose the perfect view. For example, you may want to magnify your

picture so that objects change size, perhaps allowing you to study them in more detail. The following sections show you how to work with different window views.

Most of the functions described can be accessed using the View menu or tab, or using the picture pop-up menu. You can also change certain picture properties using VBA. Refer to the [Writing Scripts](#) manual for more information.

### Zooming In and Out of Pictures

The viewing area of a picture is like an adjustable camera lens; it allows you to magnify or reduce the image on the screen. Magnifying an image (*zooming in*) lets you work on detailed areas of your picture. Reducing an image (*zooming out*) lets you work on the overall structure of the picture.

You can choose four different percentages of magnification when zooming in and out of pictures - 50%, 100%, 150%, or 200%. By default, the viewport is set at 100% view magnification, giving you the maximum viewable amount of your picture. When you change the magnification of the picture using the zoom function, you change the width and height of the picture's viewport, but not the size of the objects in the picture. Objects *appear* to get bigger or smaller, allowing you to view more or less detail, but they are actually the same size.

**NOTE:** When zooming in and out of pictures, grids may not appear in the picture properly.

You can use Zoom with both Logical and Enhanced Coordinate Systems; however, Zoom acts differently with each coordinate system. That is, with the legacy Logical Coordinate System, you had to decrease the Zoom Factor to increase the Zoom Percentage. With the Enhanced Coordinate System, you must increase the Zoom Factor to increase the Zoom Percentage.

- With the Logical Coordinate System - Zooming In (greater than 100%) is applied by reducing or decreasing the viewport; thus, the zoom factor is less than 1. ZoomOut increases the viewport, thus, the Zoom Factor is greater than 1.
- With the Enhanced Coordinate System - Zooming In to a picture increases the Zoom Factor, and Zooming Out reduces or decreases the Zoom Factor.

The following table lists examples of zoom percentage and corresponding zoom factor for each coordinate system. For example, a zoom percentage of 200% is represented as a Zoom Factor of 0.5 for the Logical Coordinate and 2.0 with the Enhanced Coordinates System.

Zoom Percentage	Zoom Factor	
	Logical Coordinate	Enhanced Coordinate
50%	1.5	0.5
100%	1.0	1.0
150%	0.75	1.5
200%	0.5	2.0

**IMPORTANT:** Scripts written in for Logical Coordinate System must be changed for the Enhanced Coordinate System. In particular, when using the Zoom Property with scripts in pictures that have been upgraded to use the Enhanced Coordinate System, you must change the script to reflect the new behavior. For more information on Zoom Property and changing scripts, refer to the [iFIX Automation Reference e-book](#).

**NOTE:** For Logical Coordinate System pictures only, **y/SHIFT** while clicking and dragging a corner of the window. This makes the object appear to change shape without **cCTRL** ou can accomplish the same function of a zoom by simply pressing changing the viewport, just like a zoom. For pictures that use the Logical Coordinate System, refer to the Key Sequences that Change the Picture Size table in the [Determining a Window Size](#) section. This key sequence does not apply to pictures that use the Enhanced Coordinate System.

### Default View and Full View

**NOTE:** This option does not apply to pictures that use the Enhanced Coordinate System.

If your picture uses the Logical Coordinate System and you make changes to your window, you may decide that you prefer the original view. To restore the original view, use one of the following methods:

- Right-click the picture and select Default View from the pop-up menu.
- Select Default View from the View menu (Classic view).
- Click View and then Default View from the Picture group on the View tab (Ribbon view).

Your picture will appear as you originally created it before making any changes.

If you make the size of your window smaller, you can return the window to full view by selecting Full View. The Full View function expands the size of the window and changes the viewport. You can also perform a full view by pressing **<Shift>** and dragging the window to fill the screen of the window.

### Fitting the Picture to Window or Window to Picture

**NOTE:** This option does not apply to pictures that use the Enhanced Coordinate System.

If your picture uses the Logical Coordinate System and you adjust the window size of your picture, you may want the objects in the picture to be accurately represented within the new window size. To fit the picture to the new window, use one of the following methods:

- Right-click the picture name in the system tree and select Fit Picture to Window from the pop-up menu.
- Select Fit Picture to Window from the View menu (Classic view).
- Click Window and then Fit Picture to Window from the Picture group on the View tab (Ribbon View).

The picture is adjusted to the new window size, so that the objects in the picture are the same size relative to the new window.

To adjust the size of the window to fit as much of your picture as possible:

- right-click the picture name in the system tree and select Fit Window to Picture from the pop-up menu,
- select Fit Window to Picture from the View menu (Classic view), or
- click Window and then Fit Window to Picture from the group Picture on the View tab (Ribbon View)

If the viewport stretches beyond the boundary of the picture, scroll bars are added to the picture.

**NOTE:** Scroll bars may be added when a picture is created using the Picture wizard in Classic view and then opened in Ribbon view. If this occurs in a picture using legacy Logical Coordinates, select Fit Picture To Window from the right mouse menu and save the picture to eliminate the scroll bars. Use Zoom To Fit for Enhanced Coordinate pictures.

## **Updating Window Location**

The Update Window Location function allows you to retain a specific picture configuration, maintaining the document, window, and viewport sizes that you create. When you open the picture later, or switch back to the configuration environment after viewing it at run-time, the picture appears exactly as it did on the screen when you originally created it.

In this way, Update Window Location is *not* the same as saving your picture. Saving alone does not retain window properties, and does not guarantee that your picture will look exactly the same when you re-open it again at a later date. So be sure to save your picture *after* you have updated the window location to your exact specifications.

Update Window Location is an effective way to create pop-up windows for your application that appear exactly the same, regardless of what resolution they are viewed on. To use this function, employ one of the following methods:

- Right-click the picture in the system tree and select Update Window Location from the pop-up menu.
- Select Update Window Location from the View menu (Classic view).
- Click Window and then Update Window Location from the Picture group on the View tab (Ribbon View).

Next, save your picture.

### **Zoom to Fit**

When pictures are created or upgraded with the Enhanced Coordinate System, the Zoom to Fit option automatically scales the entire picture to fit within the current screen while suppressing scroll bars. Objects are not distorted and retain their original shape. Zoom to Fit is only available for viewing pictures, edits are not permitted. Zoom to Fit can be used in both Configuration and Runtime modes.

### **Changing the Screen Resolutions**

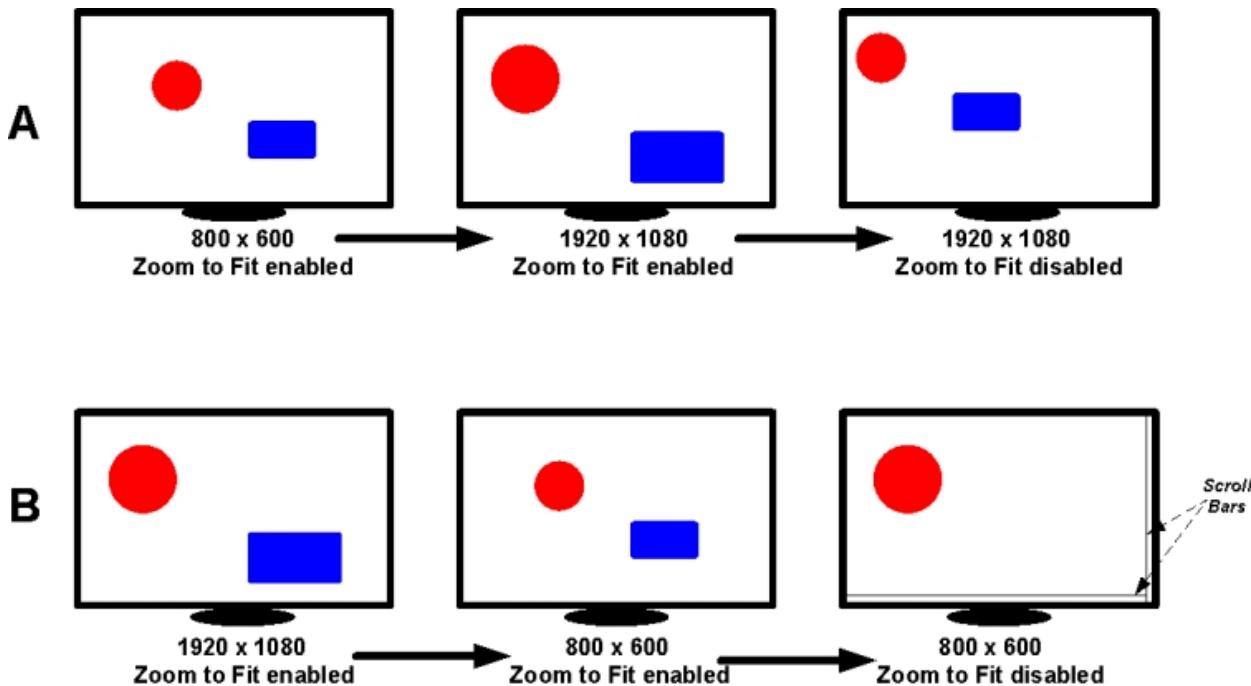
If you change the screen resolution for a picture in Zoom to Fit, the picture looks differently even though the aspect ratio remains unchanged. The objects within the picture appear to have changed size because the Zoom to Fit option makes the best use of the available screen space. If you change the resolution from:

- a lower resolution to a higher resolution, the objects in your picture appear larger
- a higher resolution to a lower resolution, the objects in your picture appear smaller

If you choose to disable Zoom to Fit (Ctrl+M) for the picture in the new resolution, the scroll bar becomes enabled and the objects within the pictures appear differently as the software accommodates the adjusted screen space.

For example:

- As shown in sequence A, changing the screen resolution from 800 x 600 to the new 1920 x 1080 resolution, makes the objects appear larger. When you disable Zoom to Fit, scroll bars are enabled and the images appear smaller.
- As shown in sequence B, changing the screen resolution from 1920 x 1080 to the new 800 x 600 resolution, makes the objects appear smaller. When you disable Zoom to Fit, scroll bars are enabled and the images appear larger or may not appear on the screen.



#### Viewing Overlaid Objects

When overlaying objects in a graphic (in configuration mode), make sure the alignment of each object is as you expect it. When overlaid objects are not aligned properly, viewing these objects in Zoom to Fit (in run mode) may not display as you expect. For example, if text is overlaid on a rectangle object and the text object is not aligned during configuration mode, when you view the objects with Zoom to Fit (in run mode), the text size may increase and hide one of the rectangle's edges. If this occurs, return to configuration mode and adjust the overlays to align properly.

#### How to Control How the Font in Text and Datalink Objects is Zoomed

You can control whether font in Text or Datalinks is zoomed with a setting in the FixUserPreferences.ini file. When this setting is enabled, zoom is enabled on these objects. By default, this setting is enabled. The FixUserPreferences.ini file is found in the LOCAL folder in the iFIX base path. By default, this path is: C:\Program Files (x86)\GE\iFIX\LOCAL.

To disable or enable this behavior, modify the RecalcTextRectOnZoom parameter in the [ShapePreferences] section of the FixUserPreferences.ini file. For example, 1 is enabled and 0 is disabled. For example:

```
[ShapePreferences]
ForegroundColor=8816262
BackgroundColor=16777215
...
RecalcTextRectOnZoom=1
To disable the new behavior, set RecalcTextRectOnZoom to 0. For example:
RecalcTextRectOnZoom=1
```

The WorkSpace must be restarted for any changes to the RecalcTextRectOnZoom parameter to take effect.

## Selecting Window Properties

As discussed in the previous sections, the area of the window that you can resize is called the client area. Essentially, the screen is the window less decorative properties, or decorations. To give your pictures a custom design and look, you can select or modify the following window decorations:

- **Title bars** - Adds a title bar to your picture.
- **System menus** - Adds system menus to your picture.
- **Sizing borders** - Adds sizing borders so that you can resize (or scroll) your window.

To show or hide the decorations listed above, select or deselect the appropriate check boxes in the Edit Picture dialog box. The window decorations enabled by default appear on the Picture Preferences tabbed page when you open a new picture.

Additionally, you can add the following window properties to your picture:

- **Always on Top** - Configures the window so that it is always on top when you open it. You can select this feature in the Edit Picture dialog box, from the picture preferences tab in the User Preferences dialog box and the Property Window.
- **Click and Stick Enabled** - Allows you to view which objects can be selected, can perform actions, or can have actions performed on them. You can select this feature from the picture preferences tab in the User Preferences dialog box. You cannot select this feature from the Property Window.
- **Grid Enabled** - Displays a grid on the window. You can select this feature in the Edit Picture dialog box, from the picture preferences tab in the User Preferences dialog box and the Property Window.
- **Snap to Grid** - Allows objects to snap to a grid point in a grid. You can select this feature from the picture preferences tab in the User Preferences dialog box and the Property Window.
- **Runtime Visible** - Allows you to run a picture in memory without a visible display in the run-time environment. You can select this feature in the Edit Picture dialog box and the Property Window.
- **Disable caching for this picture** - allows you to disable picture caching for an individual picture. You can select this feature in the Edit Picture dialog box. See the [Using Picture Caching](#) section for more information about picture caching.

Each of the available properties can be turned on or off, allowing you to create the exact look and feel you want. For example, you can:

- Simulate dialog boxes by creating a window with the title bar and system menu enabled.
- Create a tool palette for operators using a window with the sizing borders and system menu disabled.
- Create an opening title screen by creating a window with the full screen enabled, and the other window properties disabled.
- Simulate an alarm condition where an object makes a sound when the cursor passes over an object. Do this by creating a window with Click and Stick Enabled selected.

## Creating Picture Types Using Window Properties

Use the following table as a guideline to help you define your picture properties.

## Creating Picture Types Using Window Properties

To create a...	Select these properties...
Dialog box	Titlebar System Menu Resizeable
Toolbar	Titlebar System Menu Resizeable Always on Top
Palette or control panel	Titlebar Always on Top
Non-movable banner	Always on Top
Detail window	Titlebar System Menu Resizeable
Pop-up alarm messages	Titlebar System Menu Resizeable Always on Top
Resizable picture with hidden objects, not displayed at run-time	Resizable

For more information on the window and screen in an iFIX document, refer to the section, [The Window](#).

## Selecting Additional Picture Properties

The User Preferences dialog box contains several additional properties you can apply to your pictures. To access them click the Picture Preferences tab. The following properties are available in the right column of the Properties area:

- **Highlight Timeout Interval** - When Click and Stick is enabled, this time period defines how long before the highlight around an object disappears when it is not selected.
- **Grid Interval** - When the grid is enabled, this interval (entered in pixels) determines the distance between the dots in the grid.
- **Using Click and Stick** - Click and Stick allows you to view which objects can be selected, highlighted, or modified at run-time. As the mouse moves over an object, a single highlighted box *clicks* around the object if it is selectable. If the object is highlighted, use the mouse to select or stick the object and it becomes the current object. To enable or disable Click and Stick, select or deselect the Click and Stick Enabled check box.

## Designing Your Pictures

Developing a strategy for your pictures is a lot more than defining a picture type and window size. You can apply many strategies to help you achieve the maximum performance from your pictures. Employing these strategies can make your development easier and less costly.

Some of the more effective strategies you can implement include:

- Speeding development time.
- Improving performance by using the tools that iFIX gives you.
- Making the design flexible so that you can easily maintain pictures.
- Securing pictures so they are accessible to specific users.

The sections that follow describe some of the strategies that you can use.

- [Design Tips](#)
- [Finding and Replacing Data in Pictures](#)
- [Using Process Assistants](#)
- [Working with Color](#)
- [Securing Your Pictures](#)

## Design Tips

We recommend that you keep the following tips in mind when designing your pictures.

### General Tips

The following tips are for developing pictures with either the Logical or Enhanced Coordinate Systems.

- **Use the tools that iFIX provides you to accomplish the job.** Using the tools available to you helps you quickly implement your process development strategy. Examples: using Dynamo objects for common object groups; using screen regions to determine color schemes; using Find and Replace to locate and change data; using Experts to add scripts to objects.
- **Get data once.** Because iFIX allows you to obtain your data from a variety of sources and use that data throughout the open environment of the iFIX WorkSpace, you only need to *hook* to that data source once. So, for example, if you want to attach a data source to many objects in your picture, you can do so by distributing the data from one object throughout your picture. There is no need to fetch data again or retransform that data to assign or animate properties throughout your picture.
- **Use color only when it enhances the picture and makes it easier to use.** Overusing colors, or using an ineffective color strategy, can do more harm than good to your picture design. For help in designing a coloring strategy, refer to the [Working with Color](#) section.
- **Instead of creating pictures to monitor points, use the Scheduler.** Using pictures to monitor the value of a point can be ineffective, as scripts may run continuously and never run to completion. Rather than run a looping script, the Scheduler waits for an event to occur before it triggers a point. For more information on the Scheduler, refer to the [Mastering iFIX](#) manual.
- **Use the extensive resources available to you for help.** The Help and Information folder in the system tree contains comprehensive information to help you learn about a concept or perform a

procedure. This information includes Automation Interfaces and Database Manager help, as well as a complete electronic book with context-sensitive help.

- **Use the SmoothShapes property for more polished looking images, with anti-aliasing enabled.** The [SmoothShapes Property](#) is set to TRUE for all new pictures. Old pictures will default with this setting to FALSE. Set this property at the picture-level, from the Properties window in the iFIX WorkSpace.

### Enhanced Coordinate System Tips

The following tips are for developing pictures with the Enhanced Coordinate System:

- **Design Enhanced Coordinate pictures for the terminal on which they will be viewed.** When designing the picture for a specific resolution, you should use a terminal with that same resolution for your development.
- **Use the minimum resolution when designing for a wide range of resolution for target devices.** When creating pictures that will be used on multiple resolutions, it is recommended to develop those pictures using the minimum resolution at which the picture will be displayed.
- **When upgrading pictures to Enhanced Coordinates, be sure the existing picture displays as you want it to view on the screen.** When upgrading pictures from the Logical Coordinate System to the Enhanced Coordinate system, make sure the existing picture views as you wish before you upgrade the picture. Since the upgrade process uses the dimensions of the existing picture, any issues with the existing picture are transferred to the upgraded picture.
- **Develop separate pictures for mobile devices.** When developing an Enhanced Coordinate system picture for a mobile device, create a separate picture; that is, do not use the same picture that you use for a wide screen or other full size target devices.

### Finding and Replacing Data in Pictures

Many process environments are expansive, and their size may require that pictures have multiple links to many data sources. Should managers need to reroute certain data to another node, or globally change a data source throughout a plant, they need to do so quickly, without disrupting operation or utilizing valuable resources. The Find and Replace feature in iFIX makes this possible.

To search and replace data in your pictures, select Find and Replace from the Edit menu (Classic view) or on the Home tab, in the Editing group, click Find and Replace, and complete the appropriate fields on the Find and Replace dialog box. For detailed information on Finding and Replacing data, refer to the [Finding and Replacing Data](#) section in the Understanding iFIX manual.

### Using Process Assistants

Process assistants can simplify picture development. These assistants include the following:

- [Wizards](#)
- [Experts](#)
- [Dynamos](#)

- [Global Subroutines](#)
- [Toolbars](#)

For more information on how Process assistants can help you develop your pictures more easily, refer to the [Using Process Assistants to Expedite Pictures](#) chapter.

## Working with Color

Using color is an effective way to enhance your pictures. iFIX allows you to select from millions of colors (including 24-bit), and lets you customize your colors to give you more flexibility. With iFIX colors there are *no* limitations; you have all the colors you want available to all objects, all the time. Using these colors, you can:

- **View colors by name.** By clicking a tab, you can view all of the available colors by name, giving you an easy way to select across a color spectrum without choosing from a palette.
- **Customize your colors.** You can assign unique colors and create a custom palette. If you are using named colors, you can give the color a specific name.
- **Color as you go.** Using the Color Selection dialog box, you can edit as many objects as you like while the dialog box remains on your screen.
- **Select which property you want to modify.** You can select the property you want to modify (foreground, background, or edge color).
- **Animate your colors using a Color Expert.** Using one of the Color Experts on the Experts toolbar, you can animate a foreground, background, or edge color with ease.

### Modal versus Modeless Color Selection

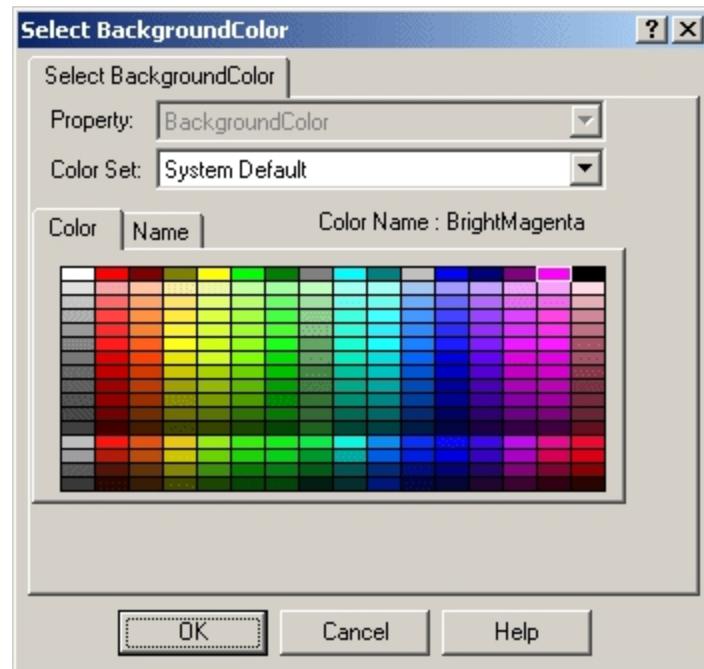
You can incorporate color to your objects in two ways:

- Selecting a fade, foreground, background, or edge color for a specific object using the *modal* Select Color dialog box. The *modal* color box is used to apply a color only to the object selected. Once you select a color, you click OK and the dialog box closes.
- Selecting a color to one or more objects, or designing a custom color set, using the *modeless* Color Selection dialog box. The *modeless* color box is used to color as many objects as you like, as it stays on your screen as you jump from object to object in your picture.

The following sections detail how to incorporate colors into your pictures using both methods.

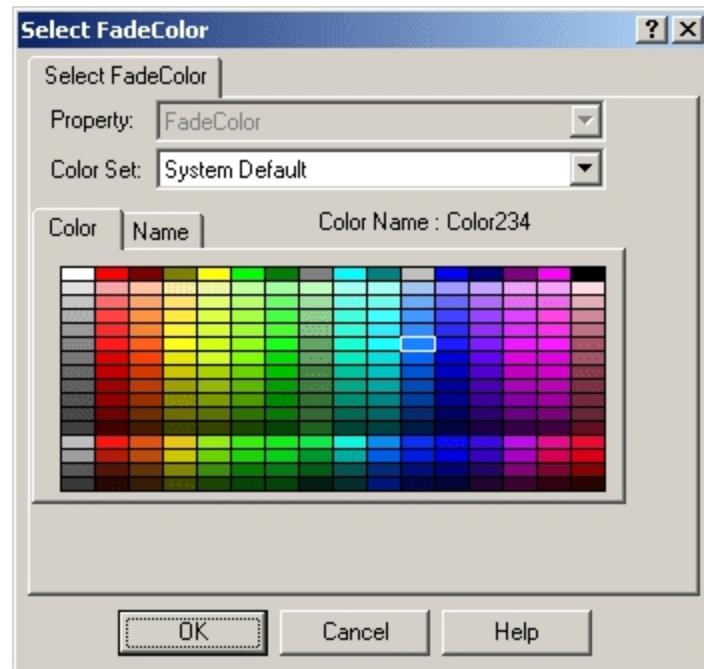
### Adding Colors to a Selected Object

You can specify fade, foreground, background, and edge colors using the modal Select Color box, shown in the following figure.



This dialog box is accessed by right-clicking an object, pointing to Color and selecting Foreground, Background, or Edge from the pop-up menu. It is also accessed when you click either the Foreground or Fade button on the Select Color dialog box shown below. This dialog box contains two tabs that let you choose your color from a palette or from a list of names. You select a color by either clicking the color in the palette or by clicking the name in the list.

You can specify all of the gradient fill settings at one time using the Select FadeColor dialog box, as shown in the following diagram.



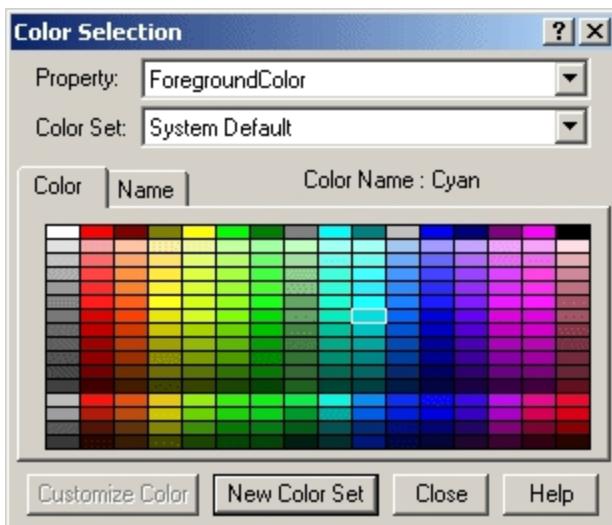
The Select FadeColor dialog box is accessed by right-clicking an object, pointing to Color, and selecting Fade from the pop-up menu. This dialog box also appears if you select Foreground from the pop-up menu when the object's fill style is Gradient. When you click either the Foreground or Fade color button the Select Color dialog box appears, as shown in the first diagram above.

Default color selections appear in the Shape Preferences tabbed page of the User Preferences dialog box.

**NOTE:** You can also specify a background color for your picture using the Edit Picture dialog box or Shape Preferences tabbed page. For more information, refer to the [Setting the Picture Background and Fade Colors section](#).

### Adding Colors to Multiple Objects

You can specify foreground, background, and edge colors to as many objects as you like using the modeless Color Selection box, shown in the following figure.



Because the Color Selection box remains on your screen as you add or modify objects in your picture, you can make changes to your objects without having to exit and re-enter the dialog box. To access the Color Selection dialog box, click the Color button on the Tools toolbar (Classic view) or on the Format tab, in the Styles group (Ribbon view) or the Toolbox, if enabled.

The Color Selection dialog box contains two tabs that allow you to display the default system colors in either a color palette or a list. To select a color, click a color in the palette or click a name in the list.

The ColorSet field displays the current default color set being used, and it also contains any custom sets you may have created. You can create a new custom set from the list provided, or create your own custom set using a customized palette. All palettes are automatically saved when the iFIX WorkSpace shuts down.

In the Property field, you can choose the foreground, background, or edge property to assign to the selected color. That property changes when you change a color in the dialog box.

### Using Custom Colors in Duplicated Objects

If you tie a custom color to the foreground of an object and duplicate the object, the custom color link will not be retained in the duplicates of the object. The duplicates will only take the color of the custom color at the time they were duplicated, future changes to the custom color will only update the original object.

## Using Named Colors

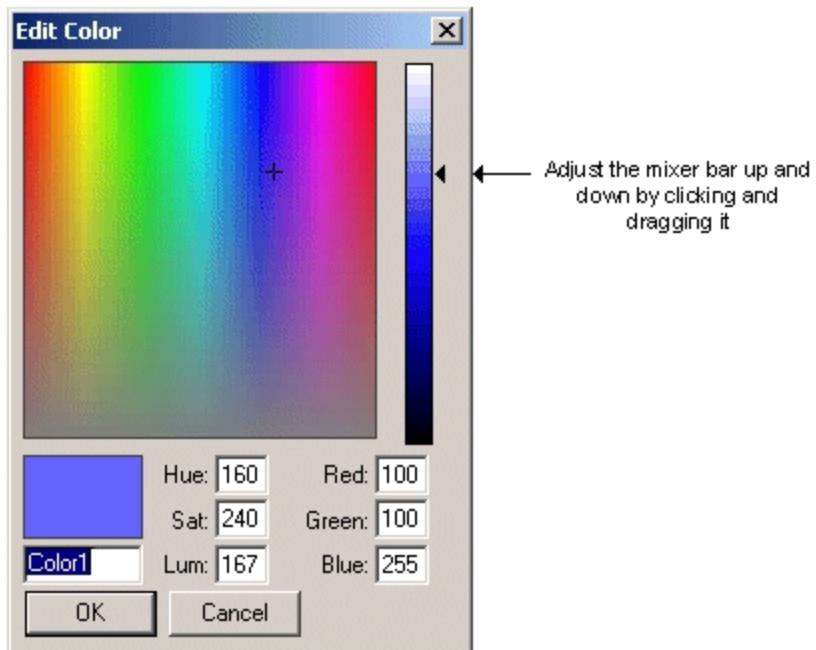
Each color in the color box is named based on its location in the color spectrum. Changing a color in a palette changes the name of that color in the name list. When creating custom color sets, you can assign custom names to colors. Each color name appears in a list, allowing you to select across multiple palettes quickly and easily. If an object uses a named color and the color is deleted or renamed, the object reverts to the 24-bit color value.

The list of named colors is saved when the iFIX WorkSpace shuts down.

## Using the Edit Color Palette

The Edit Color palette is a grid of colors ranging from red to violet that let you select a custom color of your choice. You can select any color from the palette by clicking the mouse. A four-mark cursor appears.

The slider to the right of the matrix is called a mixer bar. To specify the shade of the color spectrum you selected in the matrix, adjust the mixer bar. A black arrow appears next to the area you have selected. You can also change the shade of the color by adjusting the mixer bar up and down, as the following figure shows.



## Using the Color Experts

Color Experts are convenient process assistants that help you easily animate colors of your objects. By entering a data source and specifying certain options, you can make foreground, background, or edge colors behave in a way that benefits your process application. For information on the dialog fields on the Expert, click Help on the dialog box. For more details on the Experts that iFIX provides, refer to the

[Using Process Assistants to Expedite Pictures](#) chapter.

## Applying Background Colors

When specifying background colors for your objects, be aware that certain colors or fill patterns may not work effectively, as they may be hidden or offset by the foreground. You can also set a background color

for your pictures. For more information, refer to the [Setting the Picture Background and Fade Color](#) section.

## Securing Your Pictures

iFIX's picture protection prevents unauthorized users from accessing or modifying pictures, or performing unauthorized actions on the pictures. To configure security for your picture, enter a security area in the Properties window. For more information on configuring security for your specific environment, refer to the [Configuring Security Features](#) manual.

### Secure Containment

iFIX offers a unique security feature called secure containment, which protects your pictures in the iFIX WorkSpace in the event that a third-party control fails.

For example, if you add an OCX to your picture in the iFIX WorkSpace, and the OCX crashes, an exception is created. The iFIX WorkSpace detects this exception and isolates it so that your system keeps running. By securing your application as part of the iFIX WorkSpace, iFIX ensures that your pictures are saved even during an unlikely, yet potentially troublesome, event.

## Using the Create Picture Wizard

iFIX provides the Create Picture wizard to allow you to more easily step through some of the details inherent in creating pictures. Although the underlying picture properties are the same whether you create pictures manually or use the wizard, you can use the Create Picture wizard to easily generate pictures of a particular size, location, or configuration. You can access the Create Picture wizard by clicking the Create Picture button on the Toolbox.

The sections that follow describe the aspects of the Create Picture Wizard.

- [Accessing the Create Picture Wizard](#)
- [Types of Pictures in the Create Picture Wizard](#)
- [Overview of the Create Picture Wizard Process](#)

## Special Considerations

It is recommended that you ensure the following characteristics are the same for both the machine on which you create the pictures and the machine on which you deploy the pictures:

- Monitor resolution
- Desktop Theme (especially for users who have a mixed Windows environment)
- Font
- WorkSpace Full Screen in Run Mode
- UI configuration (Title bar height, window border size, status bar)
- Environment Protection settings (title bar, menu bar)

After you have created a picture with the Create Picture Wizard, you will need to understand the concepts found in the following sections to resize, relocate, or change the attributes of the picture:

- [What Makes Up Your Picture](#)
- [Planning Your Pictures](#)
- [Designing Your Pictures](#)

## Accessing the Create Picture Wizard

You can access the Create Picture wizard from the File menu (Classic View only), from the Ribbon (Ribbon view only), from the Task Wizard, and on several toolbars. The following table lists the most common ways to access the Create Picture wizard:

From the...	Do this...
Menu Bar (Classic view only)	Select New from the File menu, then select Picture from the New list.
Ribbon (Ribbon view only)	Click the WorkSpace button, select New, and then click Picture.
System Tree	Click the right mouse button on the Pictures folder in the System tree.
Task Wizard	Click the Task Wizard button from the Standard toolbar. Select Picture from the Task Categories list box. Select Create Picture Wizard from the Tasks list.
Experts Toolbar	Click the Create Picture Wizard button from the Experts toolbar.
Standard Toolbar	Click the Create Picture Wizard button from the Standard toolbar.
Toolbox	Click the Create Picture Wizard button from the Toolbox.

**NOTE:** To access the Create Picture wizard from the Menu Bar, the Ribbon, the System Tree, or the Standard toolbar, you must have the Show Picture Wizard from New Picture Menu check box enabled. You can enable this option in the Picture Preferences tab of the User Preferences dialog box.

### Common Elements of the Create Picture Wizard

As you can see in the [Introduction Page of the Create Picture Wizard](#), there are several elements of the Create Picture wizard that you will see on every page, including the following:

**Preview Pane** - Shows a picture configuration based on the currently selected options.

**Help Button** - Launches the Help topics for the Create Picture wizard.

**Cancel Button** - Exits the Create Picture wizard without creating any new pictures, or changing WorkSpace appearance.

**Previous Button** - Returns you to the previous page in the wizard.

**Next Button** - Sends you to the next page in the wizard.

**Finish Button** - Creates the new pictures that you have specified, and sets the WorkSpace appearance as you have specified. This button is only enabled when the wizard has enough information to successfully create new pictures.

## Types of Pictures in the Create Picture Wizard

There are three types of pictures that you can create using the Create Picture wizard:

- Pictures from a Predefined Configuration
- Custom Picture
- Default Untitled Picture

### Pictures from a Predefined Configuration

Many implementations of iFIX require a configuration of pictures that need to occupy certain areas of the screen. These pictures have different uses; some of the pictures within the configuration may be standard across the installation, and some of the pictures may differ depending on the node or the day. The Create Picture wizard provides you with a number of predefined configurations, which you can modify to suit your needs. Each configuration consists of some combination of the following default pictures:

**Main** - Occupies the entire client screen space, excluding any application title bars, menu bars, headers, footers, and left navigation pictures. You can use the sizes tab to change the height, width, and position of this picture.

**Header** - Runs across the top of the configuration. You can change the height of this picture.

**Footer** - Runs across the bottom of the configuration. You can change the height of this picture.

**Left** - Runs along the left side of the configuration. You can change the width of this picture.

**Faceplate** - Typically used as a pop-up or informational window. You can select the screen location of this picture, but the size is controlled by the configuration. This picture is created separately from the other default pictures.

Additionally, the Create Picture wizard now provides two predefined configurations for the most common handheld device screen resolutions: 240x320 and 320x240. These forms are specifically designed for handhelds that have Terminal Services capabilities. For more information on using them with Terminal Server, refer to [Optimizing New iFIX Pictures for Use with Terminal Service Capable Devices](#).

Once you have created pictures of the correct size and shape, you can use them as templates. You can open them, edit them, and save them as different pictures to suit your needs.

### Custom Picture

When you choose to create a custom picture, you can set all the properties for that picture as you step through the wizard. The end result is a single picture of the size, location, and name that you define in the Create Picture wizard.

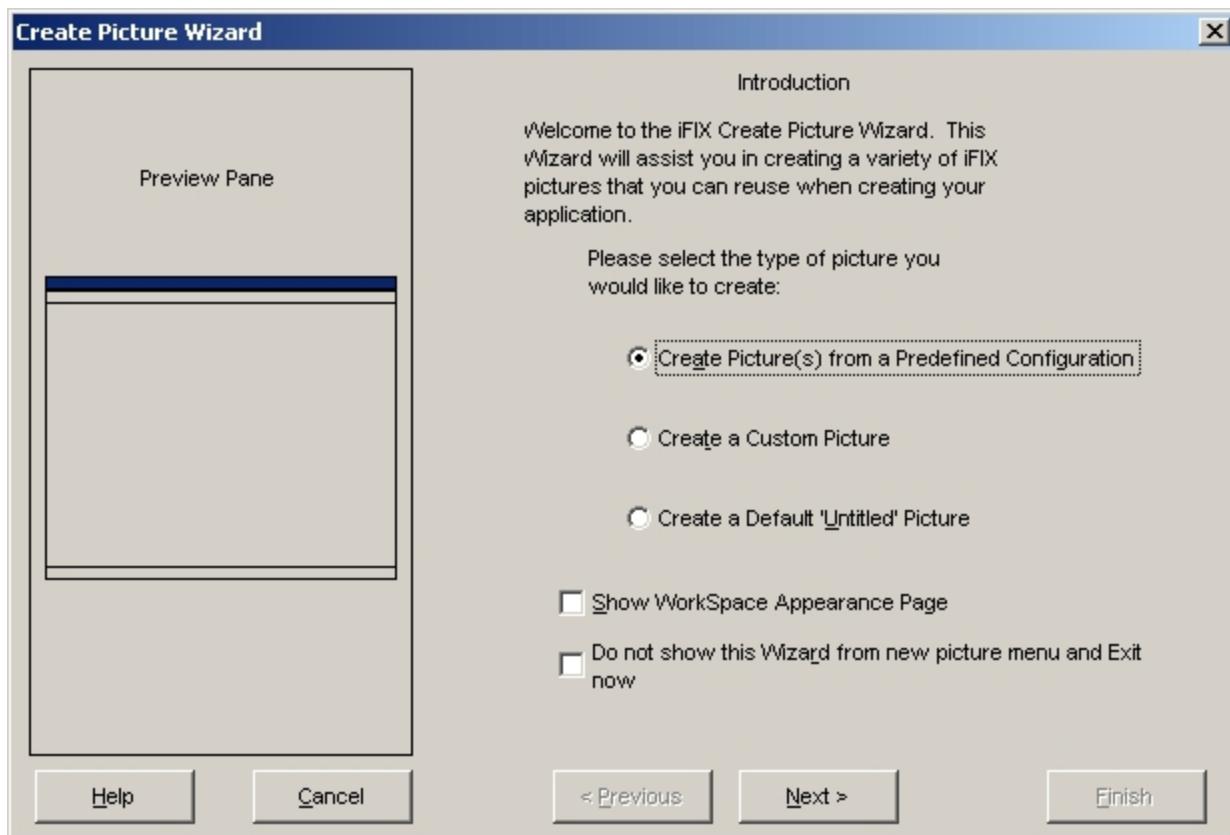
### Default Untitled Picture

Select this option to create the same picture that would ordinarily be created in the WorkSpace if you did not have the Create Picture wizard enabled. This picture will take on the size and properties that are currently set in the WorkSpace, and named Untitled.

## Overview of the Create Picture Wizard Process

The Create Picture wizard allows you to select the type of picture that you want to create, configure the WorkSpace settings for the way you want it to appear in run mode, and then specify the attributes, size, and location of each picture. The pictures are created in configure mode and added to the system tree. This section provides an overview of the process.

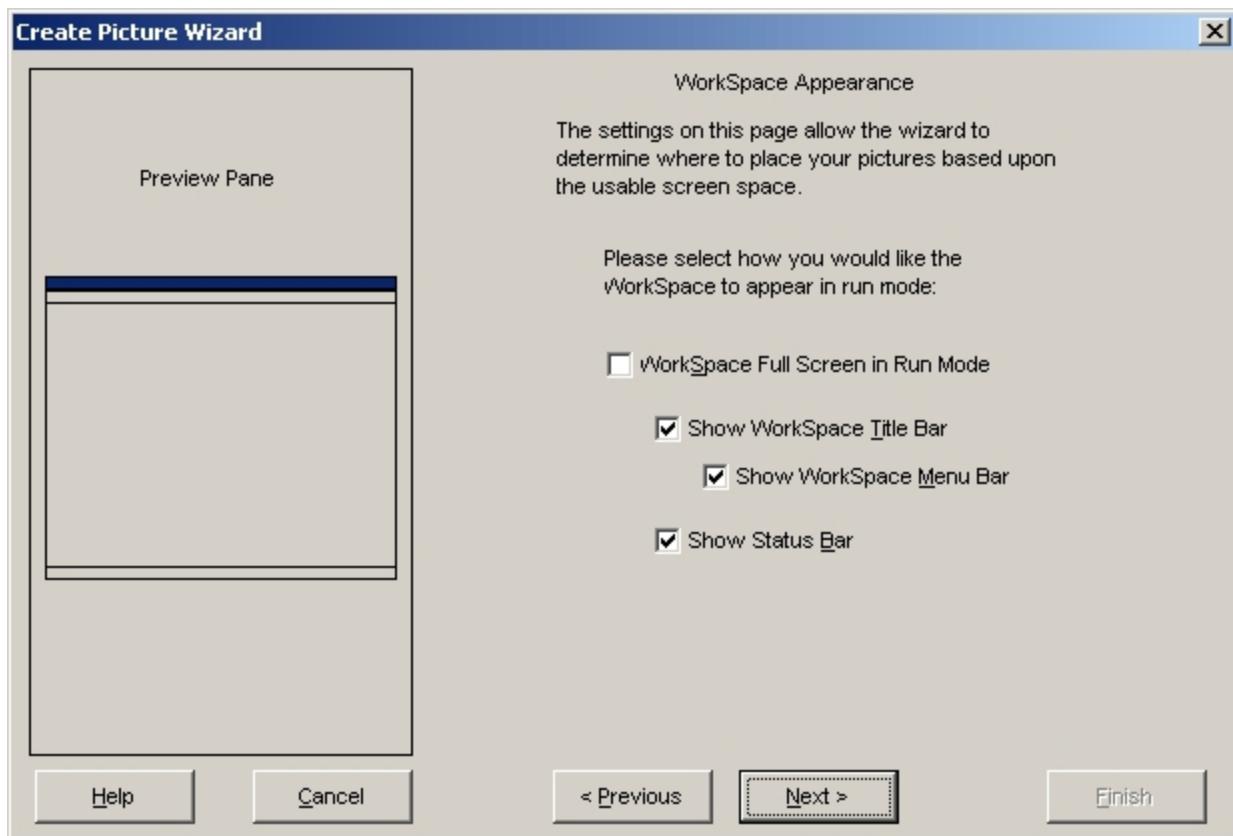
When you invoke the Create Picture wizard, the Introduction page appears, as shown in the following figure. On this page, you select the type of picture that you want to create. You also can elect to exit the wizard and disable its access from the menu bar, the system tree, and the Standard toolbar. For a description of each type of picture, see the [Types of Pictures in the Create Picture Wizard](#) section.



*Introduction Page of the Create Picture Wizard*

After you complete the Introduction page and click Next, the WorkSpace Appearance page appears, as shown in the following figure. This page allows you to set the visibility of the Title Bar, the Menu Bar, and the Status Bar in run mode, and whether the WorkSpace will be full screen in run mode.

**NOTE:** This page only appears if you selected the Show WorkSpace Appearance Page check box on the Introduction page.

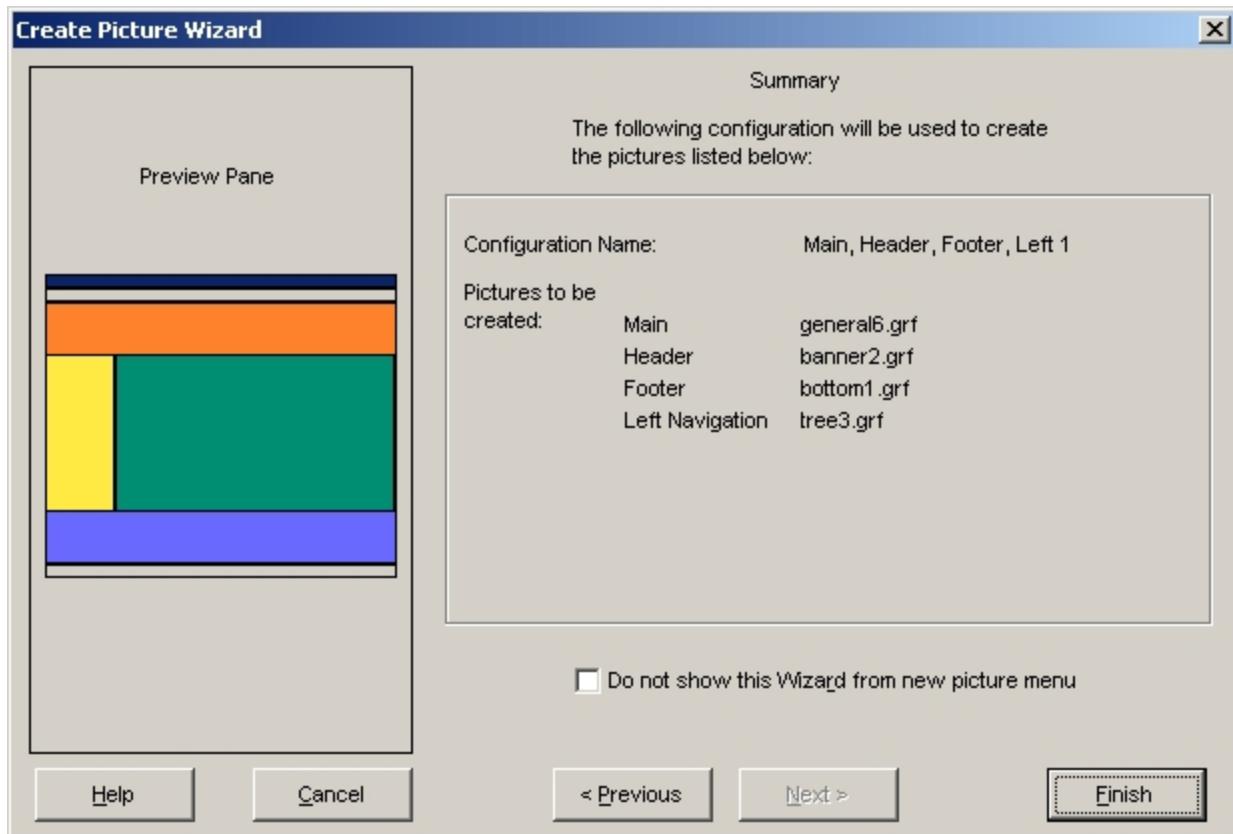


*WorkSpace Appearance Page of the Create Picture Wizard*

If you change the settings on this page, the WorkSpace preferences are automatically updated in your system when you exit the wizard. You should only need to complete the WorkSpace Appearance page once. The next time you use the Create Picture wizard, you can clear the check box on the Introduction page for Show WorkSpace Appearance Page. For more information on setting WorkSpace preferences, refer to the [Setting User Preferences](#) section in the Understanding iFIX manual.

The wizard then steps you through other pages, depending on whether you are creating a custom picture or pictures from a predefined configuration. These pages allow you to specify the size, location, attributes, and filename of each picture you create.

Once you have completed the picture specification pages, the Summary page appears, as shown in the following figure. This page presents a layout preview of the pictures you are creating, and lists the filename of each picture. From this page you can return to the picture specification pages, or click Finish to generate the pictures and add them to the system tree.



*Summary Page of the Create Picture Wizard*

For information about modifying the attributes of pictures once you have created them, refer to the [Using Basic Functions in Pictures](#) section.

## How Do I...

In the iFIX WorkSpace, you can perform the following steps with the Create Picture Wizard:

- [Accessing the Create Picture Wizard](#)
- [Creating Pictures with the Create Picture Wizard](#)
- [Creating Pictures from a Predefined Configuration](#)
- [Modifying a Predefined Configuration](#)
- [Creating Pictures with a Custom Configuration](#)
- [Changing the Attributes of Predefined Pictures](#)
- [Changing the Dimensions of Predefined Pictures](#)

### Accessing the Create Picture Wizard

► To access the Create Picture Wizard:

Use any of the following methods in the iFIX WorkSpace to access the Create Picture Wizard:

- **Menu Bar** - On the File menu, point to New and then click Picture (Classic View only).
- **Ribbon** - Click the WorkSpace button, select New, and then click Picture (Ribbon View only).
- **System Tree** - Right-click the Pictures folder in the System tree and select New from the pop-up menu.
- **Task Wizard** - Click the Task Wizard button on the Standard toolbar, select Picture from the Task Categories list box, then select Create Picture Wizard from the Tasks list.
- **Experts Toolbar** - Click the Create Picture Wizard button on the Experts toolbar.
- **Standard Toolbar** - Click the New Picture button on the Standard toolbar.
- **Toolbox** - Click the Create Picture Wizard button on the Toolbox.

**NOTE:** To access the Create Picture Wizard from the Menu Bar, the Ribbon, the System Tree, or the Standard toolbar, you must have the Show Picture Wizard from New Picture Menu check box enabled on the Picture Preferences tab of the User Preferences dialog box.

## Creating Pictures with the Create Picture Wizard

► To create pictures with the Create Picture Wizard:

1. Maximize the iFIX WorkSpace.
2. In Classic view, click the New Picture button on the Standard toolbar.

-Or-

In Ribbon view, click the WorkSpace button, select New, and then click Picture.

The Create Picture Wizard appears.

If the Create Picture Wizard does not appear, you may need to enable the Create Picture Wizard:

- a. In Classic view, select User Preferences from the WorkSpace menu.

-Or-

In Ribbon view, on the Home tab, in the WorkSpace group, click Settings, and then click User Preferences.
  - b. Select the Picture Preferences tab from the User Preferences dialog box.
  - c. Select the Show Picture Wizard from New Picture Menu check box.
3. Select the type of picture configuration you want to create. The Create Picture Wizard allows you to create the following types of pictures:
    - Create Picture(s) from a Predefined Configuration
    - Create a Custom Picture
    - Create a Default 'Untitled' Picture (When you select this option and then the Finish button, the wizard exits and creates a picture the current size of your WorkSpace.)

4. Select or clear the Show WorkSpace Appearance Page check box and then click Next. If you selected this check box, the WorkSpace Appearance page appears. If you cleared the check box, go to step 6.
5. Set the options on the WorkSpace Appearance page.  
This page configures general properties for new pictures. It only needs to be accessed once per WorkSpace session.
6. The next pages in the Wizard depend on the type of picture you chose to create. Follow the procedures associated with Step 3.
7. Click Next. If you are creating pictures from a predefined configuration, select which of the pictures in the configuration you want to create, and specify the filename for each picture on the Select Filenames page.
  - To disable a picture, clear the check box next to the generic name. Disabled pictures will not be created.
  - Enter a filename in the field next to each enabled picture.
  - If you are creating a custom picture, enter a filename in the Custom field.
8. Click Next. The Summary page lists the configuration name, the generic pictures that will be created when you click Finish, and the filename of each picture.
9. Optionally, select the Do Not Show Wizard check box to prevent the wizard from running the next time you select New Picture from the File menu.
10. Click Previous to change your pictures, or Finish to exit and add the new picture files to your system tree.

## Creating Pictures from a Predefined Configuration

► **To create pictures from a predefined configuration:**

1. In Classic view, in the iFIX WorkSpace, click the New Picture button.  
-Or-
- In Ribbon view, click the WorkSpace button, select New, and then click Picture.
2. On the Introduction page, select Create Picture(s) from a Predefined Configuration. Click Next. The Choose Configuration page appears.  
**NOTE:** If you selected the Show WorkSpace Appearance Page check box on the Introduction page, the WorkSpace Appearance page appears before the Choose Configuration page.
3. Select a picture configuration from the list.
4. Click the Modify Configuration button to customize the predefined configuration, if needed. The Modify Configuration dialog box appears. Make the modifications and return to the Choose Configuration page.
5. Click Next. The Select Filenames page appears.
6. Select which of the pictures in the configuration you want to create and specify filenames for those pictures.

- To disable a picture, clear the check box next to the generic name. Disabled pictures will not be created.
  - Enter a filename in the field next to each enabled picture.
7. Click Next. The Summary page lists the name of the predefined configuration, the generic pictures that will be created when you click Finish, and the filename of each picture.
  8. Optionally, select the Do Not Show Wizard check box to prevent the wizard from running the next time you select New Picture from the File menu.
  9. Click Previous to change your configuration, or Finish to exit and add the new pictures to your system tree.

## Modifying a Predefined Configuration

► **To modify a predefined configuration:**

1. In the Create Picture Wizard, from the Choose Configuration page, click the Modify Configuration button. The Modify Configuration dialog box appears.  
**NOTE:** The Create Picture Wizard's Choose Configuration page is only available if you select Create Picture(s) from a Predefined Configuration in the Introduction page.
  2. On the Attributes tab, select the attributes for each picture within the configuration.
  3. On the Sizes tab, change the size or position of each picture.
  4. To save your modified configuration, select one of the following options:
    - **Save** - Saves the changes for this picture only.
    - **Save As** - Saves the current options as a new configuration. When you select this option, the Enter New Configuration Name dialog box appears. Enter the name for the new configuration (up to 80 characters) in the Name field, then click OK to return to the Modify Configuration dialog box.
  5. Click Return to Wizard. If you have unsaved changes, choose whether you want to save them or not. Click Yes to save the changes for this picture only, or click No to cancel the changes you made to the configuration and reset the attributes and sizes to their previous settings
  6. The Choose Configuration page of the Create Picture Wizard reappears. Notice that the name you entered (if you saved the configuration under a new name) is displayed in the list on the Choose Configuration page.
- TIP:** If you mistakenly save a predefined configuration, select the unwanted configuration from the list on the Choose Configuration page and click Delete Configuration.

## Creating Custom Pictures

► **To create a custom picture:**

1. In Classic view, click the New Picture button on the Standard toolbar.  
-Or-  
In Ribbon view, click the WorkSpace button, select New, and then click Picture.
2. On the Introduction page, select Create a Custom Picture.

**NOTE:** If you selected the Show WorkSpace Appearance Page check box on the Introduction page, the WorkSpace Appearance page appears before the Choose Configuration page.

3. Select either of the following options:
  - Use Specified Dimensions
  - Use Dimensions of Existing Picture
4. Click Next.
5. Select the attributes that you would like for the picture.
6. Click Next.
7. Specify a filename for the picture, then click Next. The Summary page lists the filename of the picture that will be created when you click Finish.
8. Optionally, select the Do Not Show Wizard check box to prevent the wizard from running the next time you select New Picture from the File menu.
9. Click Previous to change your picture, or Finish to exit and add the new picture to your system tree.

## Working with Other Applications

The open architecture of iFIX lets you easily incorporate features of external applications. The following sections detail how to add other applications into iFIX pictures.

- [Working with ActiveX Controls](#)
- [Working with Bitmaps](#)
- [Working with Windows Metafiles](#)
- [Creating Alarms Using Pictures](#)

### Working with ActiveX Controls

iFIX graphics are created and saved as ActiveX documents, which allows you to view your pictures in any application that supports ActiveX controls, such as the iFIX WorkSpace or Internet Explorer. In fact, you can think of the iFIX WorkSpace simply as a container for ActiveX controls.

### Working with Bitmaps

You can import bitmaps from another drawing application directly into a picture. Once a bitmap is pasted into your picture, you can work with the image as you would any iFIX object. In fact, you have additional options for a bitmap. When you right-click a bitmapped object, you can select the operations listed in the following table.

#### Bitmap Operations Available Through the Pop-Up Menu

Use this Oper- To...  
ation...

Animations	Animate a bitmap using the Animations dialog box.
Undo	Cancel the previous operation.
Cut	Remove the bitmap from the picture and places it into the clipboard.
Copy	Copy the bitmap to the clipboard.
Delete	Remove the bitmap from the picture.
Duplicate	Create a duplicate copy of the bitmap and place it slightly offset from the original.
Group	Combine one or more bitmaps into one grouped object.
Bring to Front	Move the selected bitmap to the front or top of the picture.
Send to Back	Move the selected bitmap to the back or bottom of the picture.
Load Image	Load a primary or secondary bitmap, either from a file or from the clipboard, that can be displayed in your picture.
Enable/Disable Transparency	Enables or disables the Transparency property in the bitmap.
Transparent Color	Assign a color to the Transparency of the bitmap. If you have your display configured for true colors, transparent bitmaps may not display properly. This may be related to the type of video card in your PC. To avert this problem, change your Windows display settings to 65536.
Button Styles	Assign a button style (No Button, PushButton, or MultiState) to the bitmap.
Edge Style	Assign an edge style (None, Sunken, Raised, Etched, Bump) to the bitmap.
Edit Script	Open the Visual Basic Editor, which allows you to edit Visual Basic scripts.
Property Window	Display the Properties Window, which allows you to view and change property values.

Let's say you want to import a bitmap, and then be able to easily view a different image related to the first. You can do this using the Load Image operation from the bitmap's pop-up menu as follows:

► **To use the Load Image operation:**

1. In Classic view, on the Shapes toolbar, click the Bitmap button, if enabled.  
-Or-  
In Ribbon view, on the Format tab, in the Insert group, click Objects/Links and then click Bitmap.  
-Or-  
If the Toolbox is enabled, click the Bitmap button on the Toolbox.
2. Select the desired directory and bitmap and click Open. The image is added to the picture with object handles.
3. With the image selected, right-click the mouse and select Load Image - Secondary from the object's pop-up menu.
4. Select the file from the Open File dialog box, and click Open.
5. To switch from one image to another, right-click the bitmap and select Display Primary or Display Secondary from the pop-up menu.

Bitmaps can also be resized. To resize an imported bitmap, select it and then drag one of the sizing handles in any direction. Bitmaps can be resized with little or no loss in picture quality.

## NOTES:

- You can copy another object as a bitmap and paste it into another graphics application such as Microsoft Paint, or copy and paste an existing object as a bitmap. You can also change the properties of a bitmap by selecting the bitmap, and then selecting a property from the Object menu.
- Bitmaps up to 24-bit graphics resolution are supported. If a picture contains a large 24-bit bitmap, there may be a short delay when opening the picture in iFIX.

## Working with Windows Metafiles

Another powerful feature of iFIX is that it lets you directly import Windows metafiles (files with the extension .WMF) into your picture. When importing metafiles, you can improve your performance by copying the object as a bitmap and then pasting it into the picture. Refer to the [Working with Bitmaps](#) section for more information on how to do this. The bitmap will use much less system memory than the metafile.

## Creating Alarms Using Pictures

You can create pictures to monitor and display alarm conditions. For example, using animations and a color by alarm strategy, you can set up thresholds to visually alert an operator that a data source is in a particular alarm state.

For more information, refer to the [Animating Object Properties](#) chapter. Refer to the [Implementing Alarms and Messages](#) manual for detailed information on how to employ an alarming strategy.

## Optimizing Picture Performance

iFIX provides you with a performance-oriented picture development tool that is open and easy to use. Because it is an *event-driven* system, iFIX does not allocate memory or use processor speed when it is not necessary. When an event occurs, only then does the system access the CPU. This makes the drawing environment of iFIX more efficient. You can draw a shape and link it to a live I/O source in a matter of seconds. And, using the design considerations outlined in the previous section, you can save even more time in your development and implementation.

Still, external to iFIX software, there are some guidelines that you should abide by to make iFIX perform more effectively for your specific needs.

The two easiest ways to optimize the performance of your pictures are to make your pictures open faster and update faster. Common to both attributes are:

**Processor Speed** - The faster the machine's processor, the faster your applications perform.

**RAM** - To avoid disk swapping, your computer must have enough memory to contain all applications, databases, and cached pictures. If the computer does not have enough memory, Windows swaps the applications to disk.

To optimize the speed at which iFIX initially displays pictures, iFIX includes a Resolve feature, described in the [Resolving Pictures](#) section that follows. To further optimize the speed at which your pictures are dynamically updated based on changes in process conditions, try doing one or more of the following:

- Use computers that have a local bus video.
- Update to a faster graphics card, if necessary.
- Avoid blinking alarms. For more information, refer to the [Blinking Alarms](#) section.
- Use exception-based processing in your database.
- Change the refresh rate. For more information, refer to the [Increasing the Refresh Rate](#) section in the Setting up the Environment manual.

## Resolving Pictures

Database information for each data source in a picture is saved as part of the picture file on disk. When a picture is displayed in the run-time environment, and the database information is not up-to-date, iFIX queries the database and *resolves* the tag definitions. This can be a time-consuming process which slows the opening of the picture.

Resolving pictures removes the need for iFIX to query the database. Therefore, resolved pictures open faster in the run-time environment. The Resolve feature is available for both pictures and schedules, and can be accessed using the Utilities toolbar or the Picture category of the Task Wizard (Classic view), or on the Applications tab, in the Utilities group, in the Utilities list (Ribbon view).

When you resolve a picture that requires autoscaling, the iFIX Resolve Task Wizard now opens the picture while resolving.

**NOTE:** If you delete tags from the process database after you resolve a picture, you need to run Resolve again.

## Blinking Alarms

Instead of using blinking alarms, use a color-by alarm or color-by value strategy to indicate alarm status. Blinking is a very time-intensive operation because the blinking object and the surrounding objects need to be redrawn each time the picture is refreshed at the specified picture refresh rate, even though the information in the object has not changed. For more information on employing a color-by alarm strategy, refer to the [Implementing Alarms and Messages](#) manual.

## Using Picture Caching

iFIX provides a picture caching capability that optimizes the performance of the WorkSpace when opening pictures by eliminating the need for picture files to be read from the disk drive. Instead, pictures that have been previously opened and closed are held in memory and, when reopened, are read from memory.

With picture caching, you can:

- Preload pictures that will always remain in the cache.
- Set the number of pictures to be reopened from the cache.

There are two types of pictures you can cache: run-time pictures and preload pictures. Run-time pictures are loaded into the cache when they are closed. When the number of cached pictures exceeds the cache size setting, the oldest picture is dropped from the cache and is replaced with the most recently closed picture. Preload pictures are loaded when the WorkSpace is started and have a property of AlwaysLoaded. They are never dropped from the cache while you are in run mode.

In a new installation of iFIX, picture caching is enabled by default with a picture count of five. In upgrades to iFIX 2.5 and later, picture caching is not enabled by default.

- [System Requirements](#)
- [Enabling Picture Caching](#)
- [Preloading Pictures](#)
- [Run-time Pictures](#)

## System Requirements

System requirements for picture caching depend on the number of pictures you choose to cache.

The current version of iFIX requires 128 megabytes of physical memory to run. However, as your cache size increases, your memory requirements will increase. Use the following as a guide for memory requirements when caching pictures. Memory should increase:

- 2 to 3 times the file size for each picture that does not include bitmaps and controls.
- 3 to 4 times the file size for each picture that includes bitmaps and controls.

For example, a 2 megabyte file that does not include bitmaps and controls requires a 4 to 6 megabyte increase in memory. A 2 megabyte file that includes bitmaps and controls requires an increase in the memory of 6 to 8 megabytes.

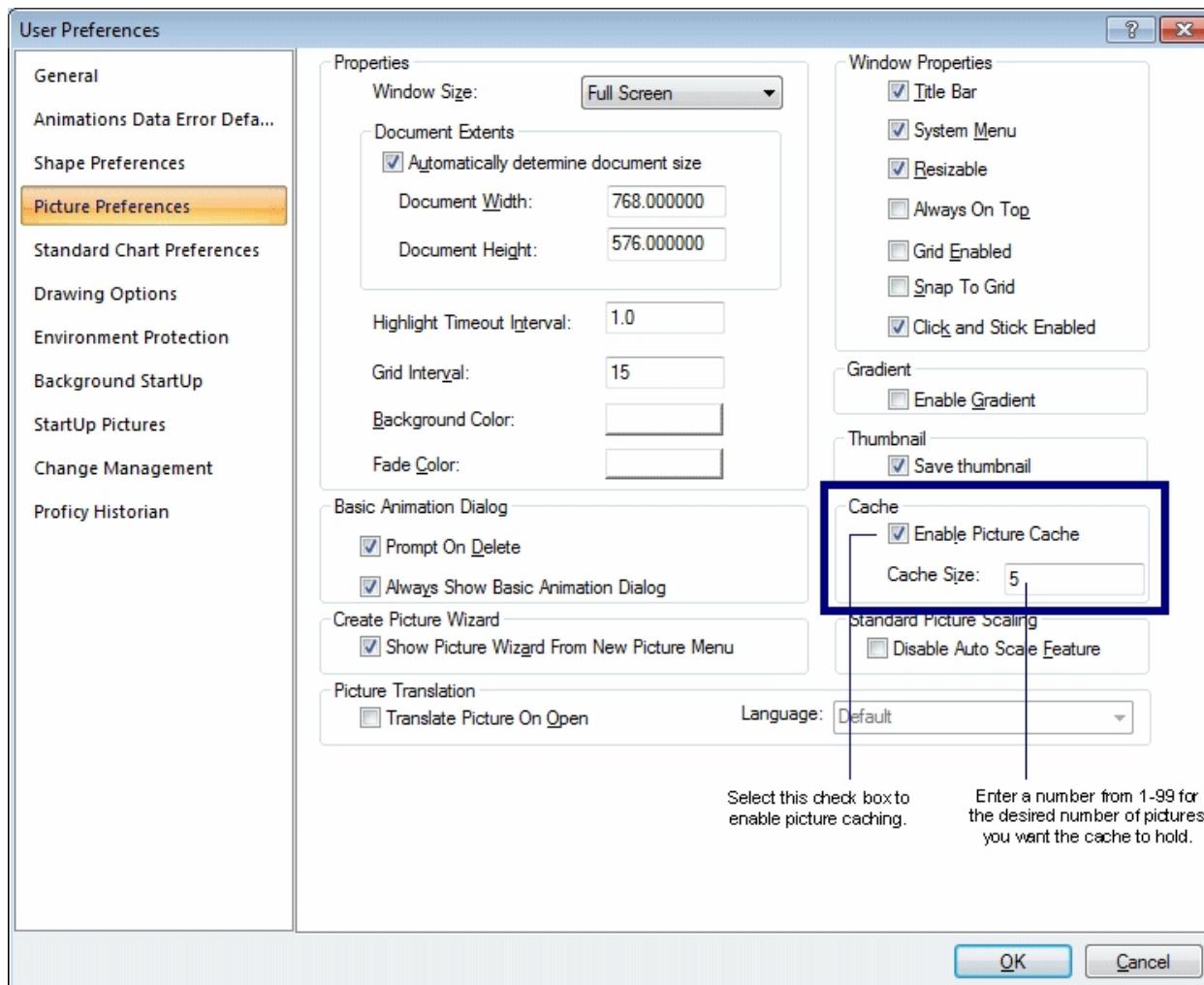
## Enabling Picture Caching

You must enable picture caching in order to preload pictures into the cache or to cache pictures at run time. You enable picture caching in the User Preferences Dialog box, shown in the figure below.

If you disable picture caching, the most recently used cache is disabled, no pictures will be preloaded, and all pictures will be fully closed when the file is closed.

**NOTE:** Picture caching, by default, is disabled when you upgrade from a previous version of iFIX to the current version. If you are installing iFIX 2.6 or later for the first time, picture caching, by default, is enabled, with a default cache size of five.

Most users will not notice any difference in the way the system behaves with cache enabled. However, if you have done extensive VBA scripting in your application, there will be a few minor differences in the system behavior. If you are upgrading from a previous version of iFIX, you should review and understand these changes before enabling picture caching. See the [Making Changes to Pictures at Run Time](#) section of this document for more information.



## Preloading Pictures

You can preload frequently used pictures directly into the picture cache when the WorkSpace starts in run mode. In order to do this, you need to modify the FixUserPreferences.ini file, located in the C:\Program Files (x86)\GE\iFIX\LOCAL directory. Use a text editor to modify this file. The following two configuration parameters are located in the [AppPreloadPicturePreferences] section of the FixUserPreferences.ini file. These parameters are required to preload pictures.

```
TotalPreloadPicturePath=<nn>
PicturePath#0=Firstpicture.grf
```

TotalPreloadPicturePath indicates the number of pictures you want to preload in the cache. PicturePath#N indicates the file name of each picture you want to preload. For example, to preload two pictures into the cache, enter the following lines to the FixUserPreferences.ini file:

```
[AppPreloadPicturePreferences]
TotalPreloadPicturePath=2
PicturePath#0=Firstpicturename.grf
```

PicturePath#1=Secondpicturename.grf

**NOTE:** The WorkSpace will only preload pictures when picture caching is enabled and the Start WorkSpace in Run mode check box is enabled. WorkSpace does not preload pictures when switching from configure mode to run mode.

Ensure that the number of pictures you enter to preload in the FixUserPreferences.ini file does not exceed the Cache Size you have set in the WorkSpace User Preferences dialog box.

Save and close the FixUserPreferences.ini file after making your changes. Restart the WorkSpace to load the new preferences settings.

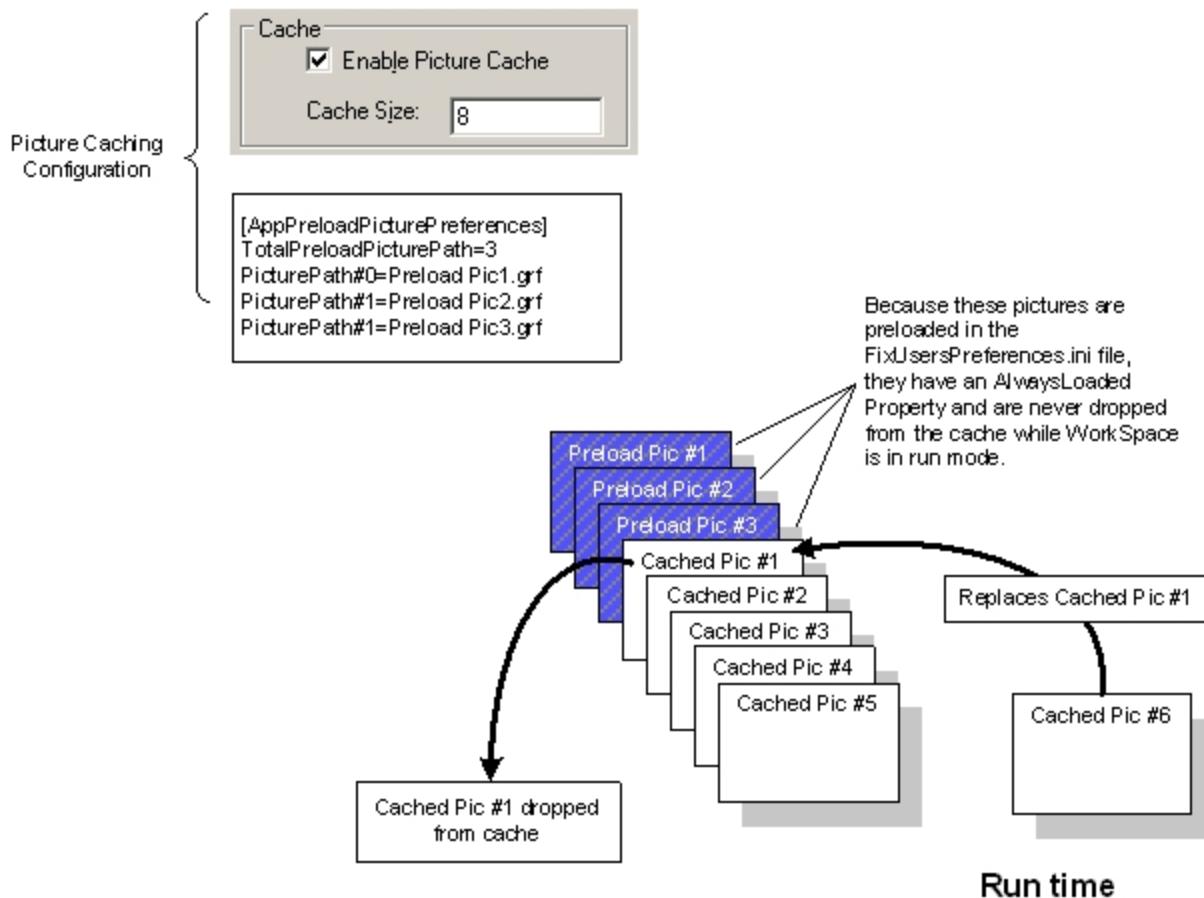
Preloaded pictures are designated as always loaded by definition. They will not be dropped from the cache while you are in run mode. Displays are preloaded only when the WorkSpace is initially started in run mode.

## Run-time Pictures

At run time, you can also cache pictures that you open and then close.

When picture caching is enabled, the WorkSpace maintains a list of the most recently closed files. When you close a file, that document is placed on the list of most recently closed files. If this list of closed files exceeds the cache size, the first file closed is unloaded from memory and completely closed. However, preloaded pictures are not dropped from the cache. You can view a list of cached pictures by pressing Ctrl + Shift + C. The following figure shows the picture caching process.

## Picture Cache Configuration



### How Picture Caching Works

**NOTE:** You cannot delete a picture that is closed into the cache. You must wait until that picture is dropped or flushed from the cache before deleting.

Picture Caching only functions when the WorkSpace is in run mode. If you switch to configure mode, the most recently closed cache is flushed and any files in the cache are fully closed. All preloaded pictures in the loaded state are then closed. If you switch back to run mode, pictures in the preload list are not loaded into memory.

If you disable picture caching, the most recently used cache is disabled, no pictures are preloaded, and all pictures are then fully closed when the file is closed.

## Making Changes to Pictures at Run Time

During run time, VBA allows you to write a script to change the properties of any object contained in a picture. These changes are not written to the stored file, but are temporary changes made to the

displayed picture in memory. If picture caching is [disabled](#), those changes are gone when you close the picture.

When you enable picture caching, some of your run-time changes are preserved while your picture remains cached. If you change any object properties (such as foreground color) through VBA or make changes to a chart through a chart dialog in run mode, you will still see those changes when you close the picture and reopen it from cache. However, your changes are not written to the stored file, and once the picture drops from the cache, your changes are lost. If you use scripts to make those changes, you should retest your displays with caching enabled.

All other behavior involving tag groups, or changing alarm summary sort or filter configurations, are not preserved regardless of whether picture caching is enabled or disabled.

## Disabling Picture Caching for Individual Pictures

iFIX also allows you to disable picture caching for individual pictures so that changes made during run time will not persist when the picture is reopened.

► **To disable picture caching for a picture:**

1. Right-click the picture name in the system tree, or right-click any area in the picture outside of an object to display the pop-up menu.
2. Select Picture... to display the Edit Picture dialog.
3. Check the Disable caching for this picture check box from the Edit Picture dialog box.

## Resizing Pictures

You can resize a picture in configure mode, so that every time you go into run mode the picture appears in the location you want it to.

**NOTE:** The type of coordinate system (Logical or Enhanced) is not relevant.

In addition, you can resize a picture through VBA. For instance, you can create a push button with code behind it that, when clicked in run-mode, resizes the picture. The steps below provide more details.

► **To resize a picture in configure mode:**

1. In Classic view, in configure mode, on the WorkSpace menu, click User Preferences.  
-Or-  
In Ribbon View, on the Home tab, in the WorkSpace group, in the Settings list, click User Preferences.
2. Click the Picture Preferences tab.
3. In the Window Properties area, make sure that the Title and Resizable check boxes are selected.  
**NOTE:** After you resize the picture, you can enable these options again, if required.
4. In Classic view, on the WorkSpace menu, click Full Screen.  
-Or-

In Ribbon view, in the WorkSpace group, click Full Screen.

5. Click and drag a corner or side of the picture to resize it.
6. When the picture is in the desired location, right-click it and select Update Window Location.
7. Click Close Full Screen.
8. Save the picture.

**TIP:** For Logical Coordinate System pictures only, if you want to restore the default picture height and width values, in configure mode, right-click the picture and select Full View. You can now repeat steps 4-8 to resize the picture again. (Full View is not available for Enhanced Coordinate System pictures.)

9. In Classic view, on the WorkSpace menu, select Run.

-Or-

In Ribbon view, on the Home tab, in the WorkSpace group, click Switch to Run.

10. Confirm that your picture appears in the desired location.

► **To use VBA to resize the current picture in run mode:**

1. In the WorkSpace configure mode, add a push button to your picture.
2. Right-click the push button, and select Edit Script. The Microsoft Visual Basic Editor appears.
3. Cut and paste the following code:

```
Private Sub Command1_Click()
Dim objFIXPic As Object
Dim dTopPct As Double
Dim dLeftPct As Double
Dim dHeightPct As Double
Dim dWidthPct As Double
Set objFIXPic = CreateObject("Workspace.Application")
dTopPct = 20
dLeftPct = 20
dHeightPct = 50
dWidthPct = 50
objFIXPic.ActiveDocument.Page.SetWindowLocation TopPct, dLeftPct, dHeightPct, dWidthPct, True
Set objFIXPic = Nothing
End Sub
```

**NOTE:** You can modify the dTopPct, dLeftPct, dHeightPct, and dWidthPct resize percentage values to the values specific to the picture you want to resize.

4. Close the Microsoft Visual Basic Editor.
5. Save your picture.
6. In Classic view, on the WorkSpace menu, select Run.

-Or-

In Ribbon view, on the Home tab, in the WorkSpace group, click Switch to Run.

7. Click the button to resize your picture.

## Maximizing the WorkSpace on Open

If you want to be sure that the iFIX WorkSpace always opens maximized, you can add this setting to the WorkSpace.ini file's [Misc] section:

```
AlwaysShowMaximized=1
```

If you later change the value from a 1 to a 0, or remove the line altogether, the iFIX WorkSpace starts in the mode it was last open in. For instance, if the window was minimized and you shut it down, when you restart the WorkSpace it will re-appear minimized. It does not matter if the WorkSpace was last in configure mode or run mode.

► **To configure the iFIX WorkSpace to always open maximized:**

1. Shut down the WorkSpace.
2. In Notepad or another text editor, open the WorkSpace.ini file in the iFIX LOCAL folder. If you installed iFIX to the default location, you can find this file in the C:\Program Files (x86)\GE\iFIX\LOCAL location.
3. In the [Misc] section, add this line:

```
AlwaysShowMaximized=1
```

4. Save the file.
5. Restart the WorkSpace.

## Changing Picture Settings in the FixUserPreferences.ini File

iFIX provides you with the FixUserPreferences.ini file that allows you to make changes to user preferences that are not available on the User Preferences dialog box, from the iFIX WorkSpace. You can also make changes to preferences that are available on the dialog box. The FixUserPreferences.ini file is installed with iFIX and is located in the LOCAL folder of the iFIX install directory. When you install iFIX to the default location the path is: C:\Program Files (x86)\GE\iFIX\LOCAL.

You can also add user preferences to this file to control certain behavior.

Use caution when making changes to the FixUserPreferences.ini file, and ensure that you are changing the correct settings. You must shut down iFIX before making your changes to this file, and then restart it for the new settings to take effect.

## Configuring Whether a Prompt Appears on Close for Changes in Run Mode

If you make a change to a picture in run mode, when you attempt to close the picture, a prompt appears warning you that your changes will not be saved. You can disable this warning prompt with the RuntimePictureChangeSaveWarning=0 setting in the [AppRunPreferences] section of the FIXUserPreferences.ini file.

Run mode changes can be made on-the-fly (via scripting) such as with the [BuildObject](#). By default, a warning message about any changes appears when you close the picture in run mode. You may want to close this picture without user interaction, and not display this message.

To allow suppress this warning message, change the RuntimePictureChangeSaveWarning=1 setting (the default) to RuntimePictureChangeSaveWarning=0 in the FixUserPreferences.ini file. By default, this message is enabled (set to 1).

► **To disable the Save prompt that displays when you close a picture with changes in run mode:**

1. Shut down iFIX if you haven't already done so.
2. Open the FixUserPreferences.ini file in a text editor, such as Notepad.
3. Find the RuntimePictureChangeSaveWarning=1 setting under the [AppRunPreferences] section.
4. Change the setting to 0.
5. Save the FixUserPreferences.ini file and restart iFIX.

## Changing the Nudge Settings

The nudge settings determine the number of pixels or degrees your object will move, scale, or rotate. Each action has both slow and fast settings. The setting is determined by whether you are using the SHIFT or CTRL keys, a combination of both, or neither, depending on the action. The following table indicates which keys or key combinations to use for these actions:

To perform the action...	Use the following keys...
SlowNudgeMoveOffset	The arrow keys.
FastNudgeMoveOffset	SHIFT + arrow keys
SlowNudgeScaleOffset	CTRL + arrow keys
FastNudgeScaleOffset	CTRL + SHIFT + arrow keys
SlowNudgeRotateOffset	+ = Counter Clockwise - = Clockwise
FastNudgeRotateOffset	SHIFT + rotate (+ or -)

**NOTE:** To perform either of the rotate actions, right-click the object and choose Rotate, then press either the SHIFT or CTRL key and use the rotate handles that appear.

► **To change the nudge settings:**

1. Shut down iFIX if you haven't already done so.
2. Open the FixUserPreferences.ini file in a text editor, such as Notepad.
3. Find the [ShapePreferences2] section.
4. Change the nudge settings, as required.
5. Save the FixUserPreferences.ini file and restart iFIX.

## Allowing a group click event

iFIX provides you with the ability to group objects in a picture and treat that group as if it is a single object. You can animate the group just like you can animate individual objects. By default, however, iFIX prevents certain objects in a group from performing events that are defined in the Visual Basic Editor, such as a message script. To allow all objects in a group to perform the desired events, change the

PassControlClickEvent setting to 1 in the [AppRunPreferences] section of the FixUserPreferences.ini file.

► **To allow a group click event:**

1. Shut down iFIX if you haven't already done so.
2. Open the FixUserPreferences.ini file in a text editor, such as Notepad.
3. Find the PassControlClickEvent=0 setting under the [AppRunPreferences] section.
4. Change the setting to 1.
5. Save the FixUserPreferences.ini file and restart iFIX.

## Disabling the Right-Click Menu

iFIX provides you with the ability to disable the right-click menu in the WorkSpace run mode. To disable the right-click menu in run mode, change the DisableRuntimeRightClickMenu setting to 1 in the [AppRunPreferences] section of the FixUserPreferences.ini file. By default, the right-click menu is enabled.

► **To disable the right-click menu in the WorkSpace:**

1. Shut down iFIX if you haven't already done so.
2. Open the FixUserPreferences.ini file in a text editor, such as Notepad.
3. Find the DisableRuntimeRightClickMenu=0 setting under the [AppRunPreferences] section.
4. Change the setting to 1.
5. Save the FixUserPreferences.ini file and restart iFIX.

## Developing Objects in Pictures

iFIX gives you all the tools you need to create simple or complex pictures for your process environment. This chapter gives you an overview of all the functionality available to you, and gives specific instructions on how to perform various operations that help you expedite picture development.

- [Adding Objects to Pictures](#)
- [Performing Basic Functions with Objects](#)
- [Performing Advanced Functions with Objects](#)
- [Creating Complex Objects](#)

### Adding Objects to Pictures

Using the Shapes toolbar, you can add an array of different objects to your picture. The following table shows you which objects are available and how to add them using the toolbar buttons:

Shapes Toolbar			
Click this button	Which can also be accessed in Ribbon view...	To add...	Double-click for multiple cre-

Icon	Description	Shape Type	Action Mode?
	From the Insert tab, in the Shapes group, click Shapes, and then click Rectangle.	Rectangles.	Yes
	From the Insert tab, in the Shapes group, click Shapes, and then click Straight Line.	Straight lines.	Yes
	From the Insert tab, in the Shapes group, click Shapes, and then click Oval.	Ovals.	Yes
	From the Insert tab, in the Shapes group, click Shapes, and then click Arc.	Arcs (curved line segments).	Yes
	From the Insert tab, in the Shapes group, click Shapes, and then click Rounded Rectangle.	Rounded rectangles.	Yes
	From the Insert tab, in the Shapes group, click Shapes, and then click Polygon.	Polygons.	Yes
	From the Insert tab, in the Shapes group, click Shapes, and then click Polyline.	Polylines (two or more connected line segments).	Yes
	From the Insert tab, in the Shapes group, click Shapes, and then click Chord.	Chords (a curved line connecting a line segment).	Yes
	From the Insert tab, in the Shapes group, click Shapes, and then click Pie.	Pie shapes (wedges of a circle).	Yes
	From the Insert tab, in the Shapes group, click Shapes, and then click Pipe.	Pipes.	Yes
	From the Insert tab, in the Objects/Links group, click Objects/Links, and then click Text.	Text.	Yes
	From the Insert tab, in the Objects/Links group, click Objects/Links, and then click Bitmap.	Bitmaps.	Yes
	From the Insert tab, in the Objects/Links group, in the Objects/Links list, click DataLink Stamper.	Data links.	No
	From the Insert tab, in the Objects/Links group, in the Objects/Links list, click Historical DataLink.	Historical Data links.	No
	From the Insert tab, in the Objects/Links group, click Objects/Links, and then click Alarm Summary.	Alarm Summaries.	No

	From the Insert tab, in the Charts group, click Line Multiline Chart.	Line Multiline Chart.	Yes
	From the Insert tab, in the Charts group, click X Bar Chart.	X Bar Chart.	Yes
	From the Insert tab, in the Charts group, click R Bar Chart.	R Bar Chart.	Yes
	From the Insert tab, in the Charts group, click S Bar Chart.	S Bar Chart.	Yes
	From the Insert tab, in the Charts group, click Histogram Chart.	Histogram Chart.	Yes
	From the Insert tab, in the Charts group, click XY Chart.	XY Chart.	Yes
	From the Insert tab, in the Charts group, click Standard Chart.	Standard Charts (compound objects made of lines, text, and rectangles).	Yes
	From the Insert tab, in the Objects/Links group, click Objects/Links, and then click Push Button.	Push Buttons.	No
	From the Insert tab, in the Objects/Links group, click Objects/Links, and then click Variable	Variable objects.	No
	From the Insert tab, in the Objects/Links group, click Objects/Links, and then click OLE object.	OLE objects.	No
	From the Insert tab, in the Objects/Links group, click Objects/Links, and then click Timer.	Timer Objects.	No
	From the Insert tab, in the Objects/Links group, click Objects/Links, and then click Event.	Event Objects.	No
	From the Insert tab, in the Objects/Links group, click Objects/Links, and then click Current Time.	Current Time (a text object).	Yes
	From the Insert tab, in the Objects/Links group, click Objects/Links, and then click Current Date.	Current Date (a text object).	Yes
	From the Insert tab, in the Objects/Links group, in the Objects/Links list, click DataLink.	Data links.	No

By default, all of the buttons in the above table appear in the Toolbox when you create or open a picture. If you have the Toolbox enabled, you can add objects to your pictures by clicking the appropriate button on the Toolbox.

**TIP:** To add multiple objects of the same type, double-click the appropriate button on the Toolbox. When you are done adding the objects, press ESC, click another button, or click the pointer selection tool in the Toolbox. For information on which buttons allow multiple creation, refer to the previous table.

A powerful feature of iFIX is the capability to add ActiveX controls (OCXs) to your pictures. ActiveX controls provide functionality to your pictures without your having to write complex code. Because of its open architecture, iFIX allows you to drag and drop any third-party object (OCX) into your displays.

**NOTE:** Because third-party objects are self-contained applications in themselves, you should be aware that problems that occur from these components are beyond the control of GE. However, iFIX does provide Secure Containment, which seals off a crashed ActiveX control and allows iFIX to run normally.

## Drawing Shapes

Once you select a shape (that is, a rectangle, rounded rectangle, oval, line, polyline, polygon, arc, chord, pie, or pipe), it is easy to add it to a picture.

Some shapes are drawn by defining a series of points using the mouse.

► **To draw an arc:**

1. In Classic view, click the Arc button on the Shapes toolbar.

-Or-

In Ribbon view, on the Insert tab, in the Shapes group, in the Shapes gallery, click Arc.

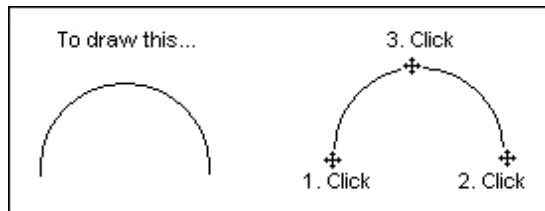
-Or-

If the Toolbox is enabled, click the button on the Toolbox.

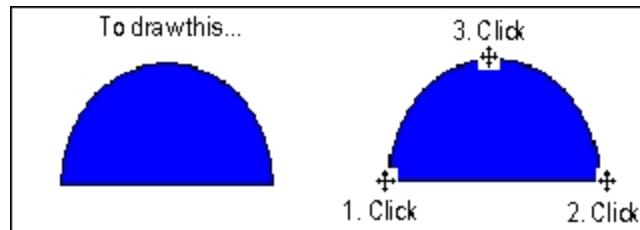
The cursor changes to a plus sign.

2. Position the cursor where you want the first point of the arc to appear and click.
3. Move the cursor to define the width of the arc and click the mouse. An arc appears on the screen.
4. Move the cursor until the height of the arc is the correct size and click.

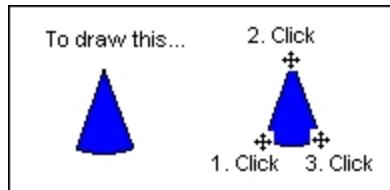
See the following illustration.



Similarly, you draw a chord as illustrated in the following figure:



And you draw a pie as illustrated in the following figure:



## Adding a Chart

You can choose to add either a Standard Chart or an Enhanced Chart to your picture. To add a chart to your picture, click the desired chart button on the Shapes toolbar (Classic view) or on the Insert tab, in the Charts group, select the desired Chart (Ribbon view). If you have the Toolbox enabled, click the button on the Toolbox. The cursor becomes a plus sign. Click and drag the mouse in an area of the picture where you want to place the chart. A chart appears on the screen, and also in the system tree.

By double-clicking the chart, you can define properties for the chart using the Chart Properties dialog box. The properties available depend on the data source selected. Chart Properties are detailed fully in the [Trending Historical Data](#) manual.

### Trending Real-time Data in Your Picture

If you choose a real-time data source, certain properties are enabled or disabled, as shown in the following table. Real-time data sources can also include T\_DATA from Trend blocks.

**Real-Time Data Source Chart Properties**

Property	Property State
Fixed Date	Disabled
Fixed Time	Disabled
Days Before Now	Disabled
Duration Before Now	Disabled
Duration	Enabled
Interval	Disabled

To plot real-time data, you must define a real-time data source. To do this, for Standard Charts, click the Chart tab, for Enhanced Charts, click the Data Sources tab, on the Chart Customization dialog box and, at the top of the tabbed page, enter a real-time data source in the Data Source field. Use *Data Server.node.tag.field* format. You can also use a local node alias by selecting THISNODE from the list.

Alternately, you can click the Browse button to display the Expression Builder, which allows you to search global data sources through a data source browser. To learn how to use the Expression Builder and define data sources, refer to the [Animating Object Properties](#) chapter.

Once you have defined a real-time data source, you can define how the data is presented. For Standard Charts, using the data area of the Chart tabbed page, you can configure pen properties, pen styles, X and Y axis properties, time ranges, grid styles. You can also define general chart properties such as a name and description, scroll direction, attributes, and appearance. For Enhanced Charts, you can use the multiple tabs available to configure every attribute of the chart's appearance and data representation.

For Standard Charts only, default settings for charts are set in the Standard Chart Preferences tabbed page of the User Preferences dialog box. For more information on using charts and applying chart properties, refer to the [Trending Historical Data](#) manual.

### How F\_CV Real-time Values Are Trended

The duration and number of samples determine how F\_CV real-time values are trended in a chart. For example, if you set the number of samples to 600 and the duration to one minute, then the chart displays a value for every second. In this example, the trend array holds a maximum of 600 seconds of data, or 10 minutes. You can change the duration to any value under or equal to 10 minutes, and the trend line continues to be plotted. However, if you change the duration to a value greater than 10 minutes the trend is cleared, and the data is plotted based upon the new duration and number of samples. The following table illustrates this example, and provides a few more.

**NOTE:** Be aware that if you want to change the duration from a small value, such as 10 minutes, to larger value, such as an hour, and back, then it is highly recommended that you use either ETR (Extended Trend Blocks) or Historical data.

Duration	Number of Samples	Then the Trend Array Contains...
1 minute	600 samples	10 minutes of data, 1 value for every second
5 minutes	600 samples	10 minutes of data, 1 value for every second
10 minutes	600 samples	10 minutes of data, 1 value for every second
1 hour	600 samples	1 hours of data, 1 value for every 6 seconds
6 hours	600 samples	1 hours of data, 1 value for every 36 seconds
12 hours	600 samples	1 hours of data, 1 value for every 72 seconds
24 hours	600 samples	1 hours of data, 1 value for every 144 seconds

### Adding Text

A text object is a collection of characters within an invisible rectangle. To add text to your picture, click the Text button on the Shapes toolbar (Classic view) or on the Insert tab, in the Objects/Links group, on the Objects/Links list click Text (Ribbon view). If the Toolbox is enabled, click the button on the Toolbox.

The default font properties for text are defined on the Shape Preferences tabbed page of the User Preferences dialog box. To change a font option for new objects, make the appropriate selections in the Font area. For example, to change the size of the font, enter a point size in the Font Size field.

If you use text with an italic font style in your pictures, the text may not always appear as expected. If the text appears clipped in your picture, use the handles to resize the text block. Selecting a different font may also correct this problem.

Text within a text object can be edited by:

- Double-clicking the text object and placing the cursor where you want to make your edits.
- Right-clicking the text object and selecting Edit Text from the pop-up menu that appears.
- Editing the Caption property. For instance, you can do this by right-clicking the text object and selecting Property Window. In the Caption field, enter your changes and press Enter.

For more information on Shape Preferences, such as how to change the text color, style, and size, refer to the [Coloring and Styling Objects](#) section.

## Adding a Bitmap Image

With iFIX, it's easy to work with bitmaps that were created using other applications. By simply clicking the Bitmap button, you can place a bitmap of your choice wherever you want in your picture, and then work with the image like you would any other object. For more information on working with bitmaps, refer to the [Working with Bitmaps](#) section.

## Adding Data Links

Data links give operators a flexible tool for displaying text and values from process databases. To add a data link to your picture, click the Datalink Stamper button on the Shapes toolbar. In Ribbon view, from the Insert tab, in the Objects/Links group, in the Objects/Links list, click Datalink. If the Toolbox is enabled, click the button on the Toolbox. In the Datalink dialog box, specify your choices for the following settings:

- Access to any data source.
- Data entry.
- Flexible display formatting.
- Definable output error messages.

After completing the Datalink dialog box, click the mouse in the location where you want to place the data link. Once you add a data link, you can access the Datalink dialog box by selecting DataLink Custom Page from the data link's pop-up menu.

The initial size of the data link is determined both by the formatting settings you choose in the Datalink dialog box and by the font settings in the User Preferences dialog box. To change the size of the font, access the User Preferences dialog box through the WorkSpace menu (Classic view) or from the Home tab, in the WorkSpace group, in the Settings list, click User Preferences (Ribbon view), and set the font properties on the Shape Preferences tab. Once you have created a data link, you can resize it by clicking on it and dragging the handles, and reformat it using the Datalink dialog box.

**NOTE:** If you add a data link by selecting Datalink from the Insert menu (Classic view) or from the Insert tab, in the Objects/Links group, in the Objects/Links list and clicking Datalink (Ribbon view), you first sketch the location and size of the data link, then complete the Datalink dialog box. In this case the size of the data link is determined by your initial sketch.

## Entering a Data Source

You can display data from any valid data source using your data link. In the Source field, enter the data source you want. You can also select from the Expression Builder by clicking the Browse button.

### Enabling Data Entry

To allow operators to enter data into the data link, select In-Place from the Type field's drop-down menu. This lets you enter data *in-place*, meaning you can display data as you enter it in the Type field. In the run-time environment, data entered is written to the appropriate database tag during the next scan cycle. When you enable data entry, you can require that operators confirm that they want this data to be written to the database before it is sent. To require confirmation, select the Confirm check box.

To help you configure data, use the Data Entry Expert. This Expert lets you determine which data source the data link receives its data from, and how that data appears.

If you use the Data Entry Expert on a data link, you must set the Data Entry Type value in the Datalink dialog box to None. If you set this value to In-Place, unexpected results may occur.

Use the Data Entry Expert to create the following types of data entry:

- Numeric/Alphanumeric
- Slider
- Pushbutton
- Ramp

**NOTE:** Do not name your picture after one of Data Entry Expert types. Picture names can conflict with the script variable names used with the Data Entry Expert. For instance, if you name your picture Pushbutton.grf and also use the Pushbutton data entry method, when you enter run mode, an error message appears. If you rename the picture, Pushbutton1.grf, the error message does not appear, since the picture name is now different than the data entry method.

You can access the Data Entry Expert from the Task Wizard. For more information on the fields of the Expert, click the Help button. For more information on using the Task Wizard, refer to the [Using Experts and the Task Wizard](#) section in the Understanding iFIX manual.

You can also create custom types of entry in VBA. For more information on VBA, refer to the [Writing Scripts](#) manual.

### Formatting Data

iFIX lets you format the data you want to display in the data link. First, you must choose one of the following types of data to display:

- Raw
- Numeric
- Alphanumeric

To display data in its raw (or native, C code) format, select the Raw Format check box. You can then edit the format by entering a C format string in the Format field. You can also enter a string of any kind preceding the raw format string (to introduce what the data string represents, for example).

To format numeric data, first select Numeric from the Type field's drop-down menu. Next, enter an integer from 0 to 7 to represent the:

- **Whole digits** - the number of digits displayed before the decimal point.
- **Decimal digits** - the number of digits displayed after the decimal point. This value is rounded off to fit into the number of digits specified for the Data link.

The following table shows some examples of how formatted numbers affect the way the data link displays in the run-time environment.

Whole Digits	Decimal Digits	Display at Run-time
2	4	12.1234
1	6	1.123456
6	1	123456.1
0	7	.1234567
7	0	1234567

**NOTE:** To format a data link to display scientific notation, first select a F\_CV, E\_CV or A\_CV field, enable the Raw Format check box, and specify %e in format field. F\_CV and E\_CV datalinks using %e raw format, by default, display 6 places after the decimal point. To display more places after the decimal point, for example 15, change %e to %1.15e. A\_CV datalinks using %e raw format will always display 15 places after decimal point. To display a leading zero in the link, use the F\_CV field and the raw format similar to %02.2f.

To format alphanumeric (or text) data, first select Alpha-Numeric from the Type field's drop-down menu. Next, enter in the appropriate fields the number of lines and the number of characters per line you want to display in the Data link. You can also justify the data to the left, right, or center, by making the appropriate selection from the Justify field.

Be aware that float point precision can differ between a datalink and what is shown in the Database Manager. In order to synchronize the two, use the following .INI file setting in the FixUserPreferences.ini file in the iFIX Local folder:

```
[AppRunPerferences]
AllowPrecisionAdjustment=0
```

A value of 0 indicates that there is no special precision adjustment for a datalink, and it will be the same precision as the Database Manager displays. The default behavior is to allow datalink precision adjustment.

### Using Tag Groups in Data Links

When using tag groups in data links and using raw format strings, you must be sure to match data types between the values and the format string.

For example, if the tag used is going to be replaced by the value of *Fix32.Thisnode.AI1.F\_CV*, the format string must be %f, or some derivative (i.e. %7.2f). The default when entering a tag group is %s, or string. If you do not adjust this and the types do not match, no formatting will occur and you will only get the value.

### Configuring the Output Error Mode

The Error Configuration area of the Datalink dialog box lets you determine how error conditions are displayed by the data link should they appear. You can configure the output to derive its value from:

- An error table, or
- The current value.

For more information on output values and definitions, refer to the [Classifying Animations Errors](#) section.

You can also display system information using the data link. To do this, add a data link to your picture as described in this section. When selecting a data source, use the format *FIX32.node:system:system field*. This data link can display a number of different system parameters of a particular node. Refer to the [iFIX Database Reference](#) help for a list of system parameters.

### Using the DataChange Event in a Data Link

If you are attempting to use the DataChange event in a data link, you cannot create the VBA object (such as Private Sub Format1\_DataChange) by selecting Edit Script from the right-click menu.

To use the DataChange event with a data link, you must use the DataChange event with the Format child object.

► **To use the DataChange event with a data link:**

1. Create a data link.
2. Open the VBA Editor.
3. Type the following code and press ENTER:

```
Private Sub Format1_DataChange(ByVal DataValue As Variant, ByVal TimeStamp as Date, ByVal Transition As Long, By
```

The VBA object gets created.

4. Enter any desired code.
5. Enter End Sub at the end of the subroutine.

**NOTE:** These steps assume that the Format object name is Format1.

## Adding Historical Datalinks to Pictures

Historical datalinks give operators a flexible tool for displaying historical values from process databases. In addition to displaying the text and values from a process database, the Historical Datalink displays a time stamp. The time stamp, in most cases, indicates the end time of the interval for the data collected. The only time this is not true is when the historical datalink is configured to collect the high, low or current value for the interval. In those cases, the time the value occurred is displayed, rather than the end time of the interval. The value in the Historical Datalink is updated at the update rate specified during configuration.

To add a historical data link to your picture, in Ribbon view, from the Insert tab, in the Objects/Links group, in the Objects/Links list, click Historical Datalink. In Classic view, click the Datalink Stamper button on the Shapes toolbar. If the Toolbox is enabled, click the button on the Toolbox. In the Historical Datalink dialog box, specify your choices for the following settings:

- Access to any data source (that contains Numeric data)
- Start date and time
- Historical mode
- Duration
- Update rate

After completing the Historical Datalink dialog box, click the mouse in the location where you want to place the historical data link. After you add a historical data link, you can access the Historical Datalink dialog box by selecting DataLink Custom Page from the historical data link's pop-up menu.

After you have created a data link, you can resize it by clicking on it and dragging the handles.

**IMPORTANT:** Be aware that Historical Datalinks or [Historical Animations](#) that use Sample or Interpolated data from GE Historian may display a Lookup or Format error status of "Unknown", when the local computer's time is ahead of the GE Historian Server's time. (The "Unknown" Lookup or Format data symbols are defined in the User Preferences, on the Animations Data Error Defaults tab.)

### Entering a Data Source

You can display data from any valid data source using your historical data link. In the Source field, enter the data source you want. You can also select from the Expression Builder by clicking the Browse button.

**IMPORTANT:**

- Be aware that while GE Historian can store both String and Numeric data, the iFIX data system can only retrieve Numeric data for historical datalinks.
- Text block values, which the GE Historian data system does NOT support retrieving, are also not supported as a the data source for historical datalinks in iFIX.

### Configuring the Data to Display

Depending on the historical mode that you choose from the Historical Mode list, you can configure the start date and time as well as the duration. If you choose the Current Value historical mode, you can only configure the update rate for the historical data link. For all other historical modes, to determine the start date for the historical data link, you can choose either a fixed, specific date, or a certain number of days before the current date. Similarly, for the start time, you can choose either a fixed, specific time, or a certain number of hours before the current time.

If you want to specify the time zone you can do so in the Time Zone area. To set the duration, or the time range for the display, select the number of days, hours, minutes and seconds in the Duration area. To set the rate at which the data is updated, set the update rate in the Update Rate area.

### Configuring the Appearance of the Data

By default, the historical datalink displays with a timestamp. The timestamp is in the regional date and time format configured for your system. If you do not want to display the timestamp with the data in any of your historical datalinks, in the User Preferences dialog box, on the Shape Preferences tab, in the Historical Datalink area, clear the Show Timestamp With Data check box. Changes made on the User Preferences dialog box only apply to new Historical Datalinks and do not effect existing historical datalinks. If you only want to hide the timestamp for the particular historical datalink you are configuring, clear the Show Timestamp With Data check box on the Historical Datalink dialog box for that historical datalink. Or, from the Property Window, for the Show Timestamp property, select False. This change applies only to the selected historical datalink and is not subject to changes on the User Preferences dialog box.

The historical datalink can be animated. To animate the historical datalink, from the right-mouse menu, select Animations. Complete your animation configuration selections on the Basic Animations dialog box.

### Adding an Alarm Summary Object

Using Alarm Summary objects in your pictures gives you an effective way to monitor, acknowledge, sort, and filter alarms using an OCX. You can color-code alarms by alarm status and priority in order to provide operators with visual cues. You can also view how many alarm occurrences have taken place between alarm acknowledgements (using the A\_ALMOCCUR block field).

To add an Alarm Summary object to your picture, click the Alarm Summary button on the Shapes toolbar (Classic view) or on the Insert tab, in the Objects/Links group, in the Objects/Links list, click Alarm Summary (Ribbon View). If the Toolbox is enabled, click the button on the Toolbox.

The Alarm Summary object appears as a spreadsheet that you can modify in both the configuration and run-time environments. For example, you can resize the object using the object's handles, resize the columns in the spreadsheet, or select rows in the spreadsheet in both environments. Additionally, you can perform many functions using the object's pop-up menu.

Before you add an Alarm Summary object to a picture, verify that specific alarming services and networking options are enabled. Refer to the [Understanding the Alarm Summary Object](#) section in the Implementing Alarms and Messages manual for more information on using the Alarm Summary object.

**NOTE:** Inserting an alarm summary into a VBA form may cause unpredictable results when opening the picture or switching environments from run-time to configuration or vice versa.

## Adding Push Buttons

Push buttons are a visually effective way to invoke an action in your picture. They can help you:

- Toggle tags between Automatic and Manual mode.
- Open and close pictures.
- Toggle digital tags between OPEN and CLOSE.
- Manipulate files.
- Run other applications.

► **To add a Push Button to your picture:**

- In Classic view, click the Push Button button on the Shapes toolbar.

-Or-

In Ribbon view, on the Insert tab, in the Objects/Links group, click Objects/Links, and then click Push Button.

-Or-

- If you have the Toolbox enabled, click the button on the Toolbox.

## Adding Variable Objects

By clicking the Variable object button, you can assign a variable object to your picture or globally to the entire system. The variable can represent different values at different times. The variables you assign include the following:

- Boolean
- Byte

- Short
- Long
- Float
- Double
- String

In Classic view, to create a Variable object, click the Variable object button on the Shapes toolbar. In Ribbon view, from the Insert tab, in the Objects/Links group, in the Objects/Links list, click Variable. If the Toolbox is enabled, click the button on the Toolbox. Next, complete the fields on the Create a Variable Object dialog box. To name a variable object, enter the name in the Variable Name field. The name must be consistent with VBA conventions. For more information on the various fields, click the Help button.

## [Adding OLE Objects](#)

iFIX lets you insert a variety of OLE objects into your pictures. In Classic view, to insert an OLE object, click the OLE Object button on the Shapes toolbar. In Ribbon view, you may also add an OLE object from the Insert tab, in the Objects/Links group, in the Objects/Links list, by clicking OLE Object. If you have the Toolbox enabled, click the button on the Toolbox.

You have three choices on the Insert dialog box for inserting an OLE object: Create New, Create from File, and Create Control.

### **Creating New OLE Objects**

The Create New option button allows you to select from a list of objects registered on the local node. To add a specific object, double-click it from the Object Type list box. For more information on adding controls, refer to the Create a Control for an OLE Object section that follows.

### **Creating an OLE Object from a File**

The Create from File option button lets you insert the contents of a file into a new object in your picture. You can either select a file from the File field or click the Browse button to select a file from any available directory.

### **Creating a Control for an OLE Object**

The Create Control option button allows you to add an ActiveX Control (OCX) to a new object in your picture. Click Add Control to display a browse dialog where you can select an OCX installed on the local node. When you select the file, a new object is inserted into your picture with the specified control. When you switch to the run-time environment, you activate the object with the control you selected.

If the "Application Data Control" appears in the list of OLE objects you can insert into a picture, be aware that you cannot use this control in a picture. This control is actually a control panel applet and is not insertable. Do not use this control.

### **Adding a Third-Party Control**

When adding third-party controls to a iFIX picture, some controls may display a message similar to the following:

```
<OCX name>: License file for custom control not found...
```

The reason you get this message is because you are adding a control that you do not have the license for. We recommend that you delete the control from your picture or install the license for this control and re-insert the control.

### **Animating the String Property of an OLE Control**

To animate the String property of an OLE Control, you must ensure that the data source is of a string type by doing one of the following:

- Connecting directly to an A\_field.
- Using a Format object to convert a F\_field to a string format.

### **List Box Example**

To add a Microsoft list box to an iFIX picture in configure mode, use the OLE Object named Microsoft Forms 2.0 ListBox. The steps below describe how to do this.

► **To add a list box object to your iFIX picture:**

1. In Classic view, from the iFIX WorkSpace, on the Insert menu, click OLE Object.  
-Or-  
In Ribbon View, on the Insert tab, in the Objects/Links group, click Objects/Links, and then click OLE Object.
2. In the Object Type list, select the Microsoft Forms 2.0 ListBox.
3. Click OK.

### **Combo Box Example**

To add a Microsoft combo box to an iFIX picture in configure mode, use the OLE Object named Microsoft Forms 2.0 ComboBox. The steps below describe how to do this.

► **To add a combo box object to your iFIX picture:**

1. In Classic view, from the iFIX WorkSpace, on the Insert menu, click OLE Object.  
-Or-  
In Ribbon View, on the Insert tab, in the Objects/Links group, click Objects/Links, and then click OLE Object.
2. In the Object Type list, select the Microsoft Forms 2.0 ComboBox.
3. Click OK.

## **Adding a Plant Applications Dynamo**

You can add a Plant Applications Dynamo to your pictures. The Dynamos simplify the process of establishing a connection between the Plant Application Server and the Client as well creating a display of the desired information, which is determined by the Dynamo selected.

To insert a Plant Applications Dynamo into a picture, first, locate the Dynamo Sets folder, which is in the iFIX WorkSpace, under the System Tree. Expand the Dynamo Sets folder to display the Dynamo sets. The Plant Applications Dynamos are in the Dynamos folder. Double-click on the PlantApplications Dynamo set. The PlantApplications.fds file displays. From the file, drag and drop the desired Dynamo into your picture. Then, complete the Dynamo configuration as prompted.

## For More Information

Refer to the following table to determine where you can find more information about the Plant Applications Dynamos.

Plant Applications Dynamo	For more information, in the Plant Applications ebook, refer to the chapter:
DynamoPAALC	Autolog Display
DynamoPAALM	Alarm View Display
DynamoPADTN	Downtime Displays
DynamoPADTP	Downtime Displays
DynamoPAGVW	Genealogy View Display
DynamoPANPT	NonProductive Time View
DynamoPAOVW	Production Overview Display
DynamoPASOE	Sequence of Events Display
DynamoPASVW	Schedule View Display
DynamoPAWASTE	Waste Displays
DynamoPAWP	Waste Displays

## Adding Timer Objects

By adding timer objects to your picture, you can perform an action based on a time interval that you specify.

## Adding Event Objects

Event objects allow you to perform an operation based on an action that you specify. After you add an event object, you must enter Visual Basic code to actually trigger the event.

## Performing Basic Functions with Objects

The iFIX configuration environment provides many basic functions that you should be familiar with as you develop objects. Once you learn how to perform a basic function on one object, you can perform that function for all objects. These functions include:

- [Using shortcut keys](#)
- [Selecting objects](#)
- [Moving objects](#)
- [Editing objects](#)
- [Renaming objects](#)
- [Changing Object Names in Scripts](#)

## Using Shortcut Keys

By pressing a sequence of keys (referred to as *shortcut keys*), you can perform specific drawing operations that help you quickly accomplish a task. The following table shows you what shortcut keys are available and their function.

### Shortcut Keys for Pictures

**Press these keys** To do the following...

**together...**

<Alt> and <arrow key> Move from one object handle to another around an object.

<Ctrl> and <arrow key> Reshape an object by moving a point at an object handle.

+ or - from numeric pad

<Ctrl> and mouse click

<Shift> and any of the above Accelerate the operation. For example: <Shift> plus <Ctrl> and an arrow key quickly reshapes an object.

Specific uses of shortcut keys are included throughout this chapter.

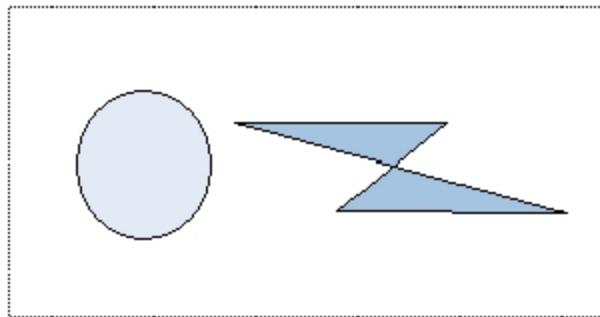
## Selecting Objects

You can select an object by clicking it with the mouse. Objects can be selected in the picture itself or in the system tree. The selected object remains selected until you click another object. When you select an object, the object's handles appear, permitting you to change the object's size. For more information on object handles, refer to the [Using Basic Drawing Tools](#) section.

### Selecting Multiple Objects

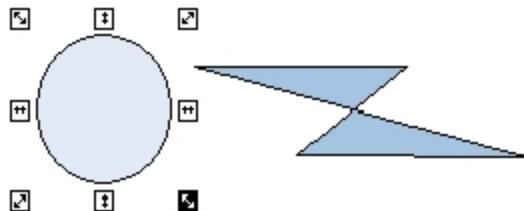
You can select multiple objects by enclosing two or more objects in a rectangle selector, or by selecting the first object and then control-clicking additional objects. The following figure shows both methods.

Enclosing the objects in a rectangle selector...

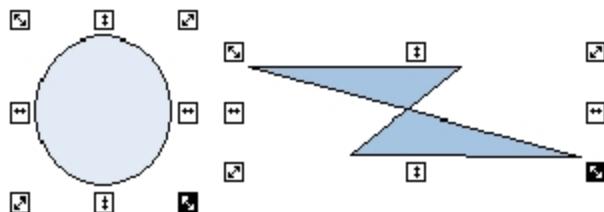


OR

Selecting one object and then control-clicking the other...



Selects both objects.



## Moving Objects

You can move any object in a picture by clicking and dragging it to its new location. To move an object quickly, hold down the Shift key and click and drag the object.

### Nudging

Sometimes you need to move an object more precisely to better control its placement in the picture. iFIX lets you move an object in small increments using the arrow keys. This concept is called *nudging*.

To nudge an object, select it and press an arrow key. The object moves one pixel in the direction indicated by the arrow key. By repeatedly pressing the arrow keys, you can slowly move the object to any desired location. To accelerate the movements, press Shift and an arrow key simultaneously.

## Editing Objects

Naturally, you will occasionally make errors when you draw your pictures. Or, conversely, you may create something that you want to apply everywhere in your picture. In either case, iFIX's editing functionality lets you quickly update how objects look in your picture.

A simple way to edit objects is to use the Edit Toolbar:

Click this button...	Which can also be accessed in Ribbon view...	To...
	From the Home tab, in the Clipboard group, click Cut.	Cut an object.
	From the Home tab, in the Clipboard group, click Copy.	Copy an object.
	From the Home tab, in the Clipboard group, click Paste.	Paste an object.
	From the Home tab, in the Editing group, click Undo.	Undo an actions performed on an object.

By default, the buttons in the above table appear in the Toolbox when you create or open a picture. If you have the Toolbox enabled, simply click the button on the Toolbox that corresponds to the editing function you want. These functions, as well as the other available editing functions, are detailed in the following sections.

### Cutting Objects

When you cut an object, you remove the object from the picture and place it into the Clipboard. Once an object is in the Clipboard, it can be retrieved by pasting it back into the picture.

To cut an object, in Classic view, click the Cut button on the Edit toolbar. In Ribbon view, on the Home tab, in the Clipboard group, click Cut. If the Toolbox is enabled, click the button on the Toolbox.

### Deleting Objects

Unlike cutting an object, deleting an object permanently removes it from the picture, unless you undo the operation. To delete an object, select the object and press Delete. Or, select Delete from the object's pop-up menu.

### Copying and Pasting Objects

iFIX lets you copy objects in two ways: by placing a duplicate copy of the object into the clipboard for pasting into your picture, or by *duplicating* the object. To copy an object, use one of the following methods:

- Select Copy from the object's pop-up menu.
- Select the object and click the Copy button on the Edit toolbar (Classic view).
- Select Copy from the Clipboard group on the Home tab (Ribbon view).

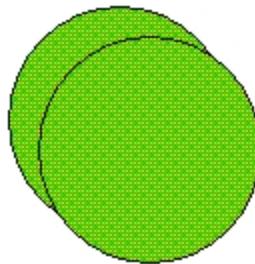
To paste the object use one of the following methods:

- Select Paste from the picture pop-up menu.
- Click the button on the Toolbox, if the Toolbox is enabled.
- Click Paste on the Edit toolbar (Classic view).
- Click Paste from the Clipboard group on the Home tab (Ribbon view).

Duplicating an object is the easier method of copying and pasting, as it combines the copy-and-paste action into one step by avoiding copying the object to the clipboard. To duplicate an object, select the object you want to copy and select:

- Duplicate from the object's pop-up menu, or
- Duplicate from the Editing group on the Home tab (Ribbon view).

A second object with identical properties of the original appears slightly offset from the original. In the following figure, the oval to the lower right is a *duplicate* of the original.



*Duplicating an Object*

You can copy any iFIX object using the copy or duplicate methods, including bitmaps and OCXs.  
**Undoing Actions**

iFIX has a number of actions that cannot be undone. If a particular task cannot be undone, the Undo command in the Edit menu is unavailable after you complete the action. For example, if you try to undo moving a chart, the command is unavailable. Typically, actions involving Standard Charts and Historical Data Links cannot be undone.

## Renaming Objects

When you add an object to your picture, iFIX automatically names the object in the system tree and numbers it in the order it was created. For example, the second rectangle added to your picture would be titled Rect2 in the Pictures directory. To more easily recognize your objects, or to assign a specific name that represents a common property in your process, you can give it an alternate name.

To rename an object, right-click the object name in the system tree and select Property Window from the pop-up menu. Place the cursor in the second column of the Name row and enter a name. You can also select Animations from the pop-up menu and rename the object from the Animations dialog box.

**IMPORTANT:** When you rename an object, avoid the use of underscores in the name. Underscores may cause problems with scripts associated with the object. For more information, refer to the [VBA Naming Conventions](#) section of the [Writing Scripts](#) manual.

## Changing Object Names in Scripts

If you change the name of an object in a script, and then change the name back to its original, you may also change the edit event that is called from that script. iFIX attempts not to use an older name that is

already used in a code or global module, but may not always be able to determine which names are valid.

### **Renaming Objects with Associated Script**

By default, if you change the name of an object that has script associated with it, iFIX automatically renames the event name and the references to the object within the script for that object. Therefore, you do not have to explicitly do anything in your scripts to make these objects work.

However, if you are indirectly referencing any object names in a script from another object (for example, setting Rect1.HorizontalPositional from the click event on Oval1), this reference is not renamed.

► **To rename these references:**

1. In the WorkSpace, perform a Find and Replace to rename all objects. We do not recommend that you use the Include Scripts option in the Find and Replace feature from the Workspace to perform this function. Doing so will replace objects that we are automatically renaming.
2. In the Visual Basic Editor, perform a Find and Replace to change any specific object references.

**NOTE:** Renaming objects in the Property Window can greatly affect how your scripts run using VBA. For more information, refer to the [Writing Scripts](#) manual.

## **Performing Advanced Functions with Objects**

Creating and manipulating objects in iFIX may often require more than cutting and pasting or moving static objects around the screen. Although these are necessary functions, there are many advanced functions that you can perform when developing or modifying your pictures or working with specific objects. These functions include:

- [Manipulating objects using toolbars](#)
- [Resizing objects](#)
- [Rotating objects](#)
- [Manipulating objects with points](#)
- [Reshaping objects](#)
- [Coloring and styling objects](#)
- [Aligning objects](#)
- [Flipping objects](#)
- [Splitting Polyline and Pipes](#)
- [Extending Lines to Intersect](#)
- [Trimming Line at the Intersection](#)
- [Converting Lines to Polyline](#)
- [Making Lines Horizontal or Vertical](#)
- [Converting Lines and Polyline to Pipe](#)
- [Modifying Pipe Characteristics](#)
- [Adding and Deleting Connection Points](#)
- [Using the Connector Tools](#)

## Manipulating Objects Using Toolbars

### Using the Tools Toolbar

Many of the advanced functions described in this section can be performed using the Tools toolbar. The following table shows you which functions are available and how they are used.

**NOTE:** Although hidden by default, you can access and use toolbars in Ribbon view. To access the Tools toolbar in Ribbon view, on the Home tab, in the WorkSpace group, click Settings, and then click Toolbars. You can also open a toolbar from the WorkSpace tree, by opening the Project Toolbar Files folder and double-clicking the toolbar you want to open.

**Manipulating Objects in Pictures Using the Tools Toolbar**

Click this button...	Which can also be accessed in the Ribbon view...	To...
	From the Format tab, in the Arrange group, click Align, and then click Align Left.	Align objects to the left edge.
	From the Format tab, in the Arrange group, click Align, and then click Align Horizontal Center.	Align objects to each other's horizontal center.
	From the Format tab, in the Arrange group, click Align, and then click Align Right.	Align objects to the right edge.
	From the Format tab, in the Arrange group, click Align, and then click Align Top.	Align objects to the top edge.
	From the Format tab, in the Arrange group, click Align, and then click Align Vertical Center.	Align objects to each other's vertical center.
	From the Format tab, in the Arrange group, click Align, and then click Align Bottom.	Align objects to the bottom edge.
	From the Format tab in the Arrange group, click Group Objects.	Group objects.
	From the Format tab in the Arrange group, click Ungroup Objects.	Ungroup objects.
	From the Format tab in the Arrange group, click Bring to Front.	Bring an object in front of another.
	From the Format tab in the Arrange group, click Send to Back.	Send an object to the back of another.
	From the Format tab, in the Arrange group, click Space Evenly, and then click Space Evenly Vertical.	Vertically space objects evenly.
	From the Format tab, in the Arrange group, click Space Evenly, and then click Space Evenly Horizontal.	Horizontally space objects evenly.
	From the Format tab, in the Styles group, click Color.	Apply color to an object or objects.
	From the Format tab, in the Font group, click Font.	Apply a font to a text object or objects.
	From the Format tab, in the Arrange group, click Grid.	Turn picture grid on and

	and then click Toggle Grid.	off.
	From the Format tab, in the Picture group, click Layers, and then click Set Layer.	Select layers for objects.
	From the Format tab, in the Picture group, click Layers, and then click Display Layer.	Display layers for selected objects.
	From the Tools tab, in the Tasks/Experts group, click Picture, and then click Refresh Rate Expert.	Display the Refresh Rate Expert.

By default, all of the buttons in the above table appear in the Toolbox. If you have the Toolbox enabled, click the button on the Toolbox.

### Using the CAD Toolbar

The iFIX configuration environment provides a CAD (computer assisted drawing) toolbar with functions for manipulating line and polyline objects. The following table shows you which functions are available and how they are used.

**Table Caption Outside Table: Manipulating Objects in Pictures Using the CAD Toolbar**

Click this button...	Which can also be accessed in the Ribbon view...	To...
	From the Format tab, in the Picture group, click Drawing Tools, and then click Extend Lines.	Extend a selected line to intersect with another selected line. Refer to <a href="#">Extending Lines</a> for more information.
	From the Format tab, in the Picture group, click Drawing Tools, and then click Trim Lines.	Trim the selected lines to the intersection point. Refer to <a href="#">Trimming Lines</a> for more information.
	From the Format tab, in the Picture group, click Drawing Tools, and then click Convert Lines to Polyline.	Convert the selected lines to a polyline object. Refer to <a href="#">Converting Lines to Polyline</a> for more information.
	From the Format tab, in the Picture group, click Drawing Tools, and then click Make Lines Horizontal.	Change the selected line(s) to horizontal. Refer to <a href="#">Making Lines Horizontal or Vertical</a> for more information.
	From the Format tab, in the Picture group, click Drawing Tools, and then click Make Lines Vertical.	Change the selected line(s) to vertical. Refer to <a href="#">Making Lines Horizontal or Vertical</a> for more information.
	From the Format tab, in the Picture group, click Drawing Tools, and then click Convert Line/Polyline to Pipe.	Convert the selected line(s) or polyline(s) to a pipe object. Refer to <a href="#">Converting Lines and Polylines to Pipe</a> for more information.
	From the Format tab, in the Styles group, click Pipe Styles, and then click Modify Pipe Characteristics.	Open the Modify Pipe Characteristics dialog box for the selected pipes. Refer to <a href="#">Modifying Pipe Characteristics</a> for more inform-

		ation.
	From the Format tab, in the Picture group, click Drawing Tools, and then click Add Connection Point.	Add a connection point to anchor the selected connector to a shape. Refer to <a href="#">Adding and Deleting Connection Points</a> for more information.
	From the Format tab, in the Picture group, click Drawing Tools, and then click Delete Connection Point.	Delete a connection point anchor from the selected connector. Refer to <a href="#">Adding and Deleting Connection Points</a> for more information.
	From the Format tab, in the Insert group, click Connectors, and then click Line Connector.	Draw a connecting line between two shapes. Refer to <a href="#">Using the Connector Tools</a> for more information.
	From the Format tab, in the Insert group, click Connectors, and then click Right Angle Line Connector.	Draw a right angle connecting line between two shapes. Refer to <a href="#">Using the Connector Tools</a> for more information.
	From the Format tab, in the Insert group, click Connectors, and then click Pipe Connector.	Draw a connecting pipe between two shapes. Refer to <a href="#">Using the Connector Tools</a> for more information.

## Using the Translation Toolbar

The iFIX configuration environment provides a translation toolbar with functions for exporting and importing language files. The following table shows you which functions are available and how they are used.

**Table Caption Outside Table: Exporting and Importing Language Files using the Translation Toolbar**

Click this button...	To...
	Export the language file for the active picture.
	Export separate language files for one or more pictures.
	Import the translated language file for the active picture.

**NOTE:** Translation functions are not available from the Ribbon in Ribbon view. To access these functions, you must display the Translation Toolbar. To access this toolbar in Ribbon view, on the Home tab, in the WorkSpace group, click Settings, and then click Toolbars. You can also open a toolbar from the WorkSpace tree, by opening the Project Toolbar Files folder and double-clicking the toolbar you want to open.

## Resizing Objects

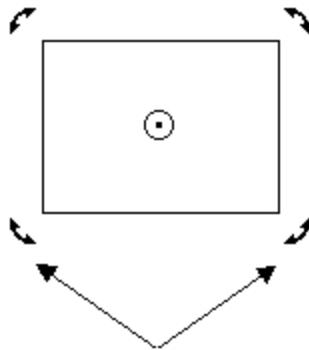
Objects other than lines, arcs, chords, and pies are automatically added with resize handles, and the default operation available through their pop-up menu is Resize. Any object can be resized, including those with points. However, for lines, arcs, chords, and pies, you must select Resize from the pop-up menu; it is not selected automatically. When you resize an object, the object changes shape uniformly, without changing its shape.

**NOTE:** Ovals, rounded rectangles, charts, and bitmaps do not have the Resize option in the pop-up menu, but do have resize handles, allowing you to resize these objects.

To resize an object, simply select the object and click and drag one of its handles.

## Rotating Objects

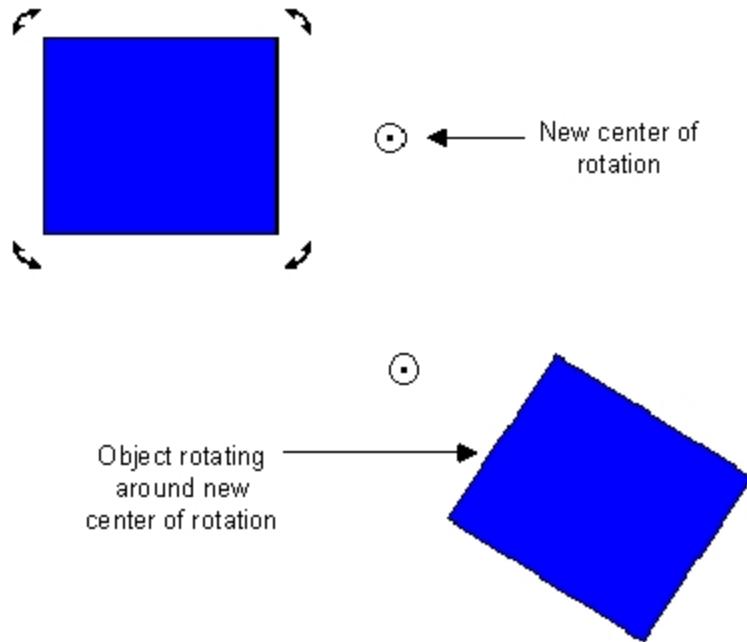
Objects naturally rotate around a center of rotation, designated by a dot enclosed with a circle. When you select Rotate from an object's pop-up menu, the object displays its center of rotation, and rotation handles showing the direction you can rotate the object. See the following figure.



*Rotation Handles*

To rotate an object around its center of rotation, click and drag one of the object's rotation handles. You can also rotate an object using the Rotate Expert, which allows you to specify minimum and maximum angles of rotation. To use the Expert, click the Rotate Expert from the Expert toolbar (Classic view) or on the Tools tab, in the Animations group, click Rotate (Ribbon view) or the Toolbox, if enabled. For help on the fields of the Expert, click the Help button.

iFIX also lets you rotate objects based on a selected center of rotation. To change the center of rotation, click and drag the default center of rotation to the desired location in the picture. When you place the cursor over the center of rotation, the cursor becomes a crosshair. Now when you click and drag one of the object's handles, the object rotates around the new center of rotation. This is illustrated in the following figure.



#### *Rotating an Object Around a New Center of Rotation*

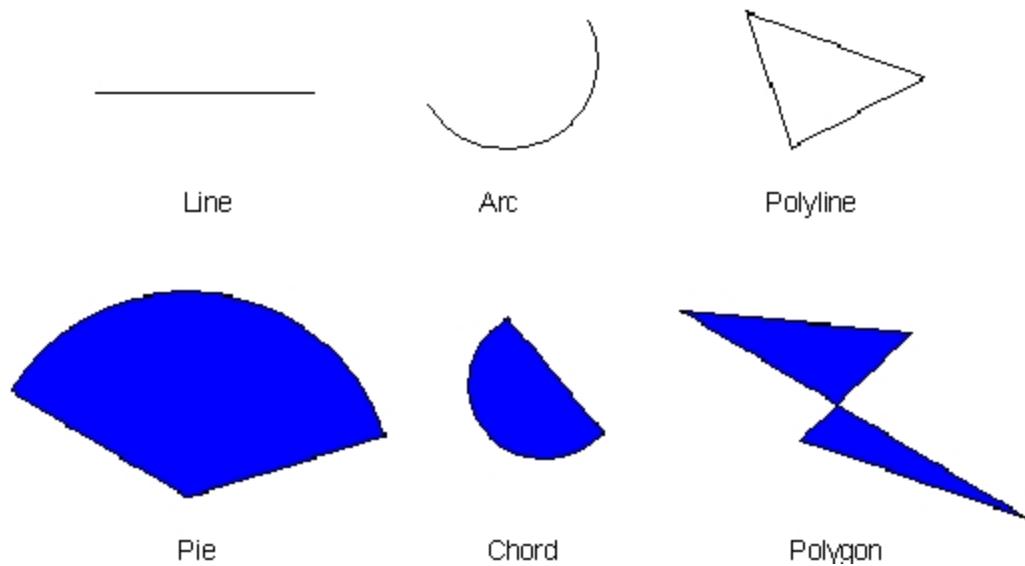
To relocate the object's default center of rotation, click the current center of rotation. The cursor becomes a crosshair, and another crosshair appears at the object's center. Move the center of rotation over the crosshair inside the object.

You can rotate any object except ovals, rounded rectangles, and charts.

**NOTE:** You can resize or rotate an object by animating it. For more information on animating an object, refer to the [Animating Object Properties chapter](#).

## Manipulating Objects with Points

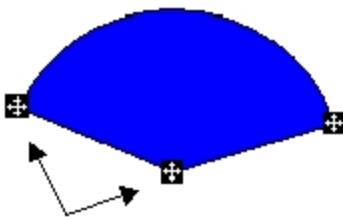
Some objects work a little differently than shapes such as rectangles and ovals, because they consist of a series of connected points. Objects with points include polygons, polylines, lines, arcs, chords, and pie shapes. The following figure illustrates the various types of objects with points.



*Objects with Points*

## Reshaping Objects

When you create an object that consists of points, the object is added to your picture with *reshape handles*, and the default operation available through the pop-up menu is Reshape. The following figure illustrates an object with reshape handles. For polygons and polylines, objects are added with resize handles, because you do not need reshape handles in order to reshape these objects. You can move the points in the object to reshape the object at 15-degree increments.



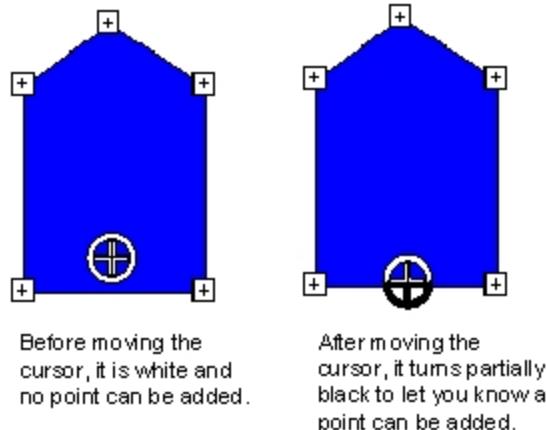
*Reshape Cursors*

For lines, arcs, chords, and pies, you can reshape the object by clicking and dragging a reshape cursor on the object.

### Adding and Deleting Points in Polygons and Polylines

To reshape polygons and polylines, you add points to or delete points from the shape. When you add a point, the cursor changes to a circle with a plus sign inside. If the cursor is black, you can add a point to the polygon or polyline. If the cursor is white, you cannot, because the cursor is not close enough to the object's edge. Move the cursor closer until it turns black or becomes partially black, as the following figure shows.

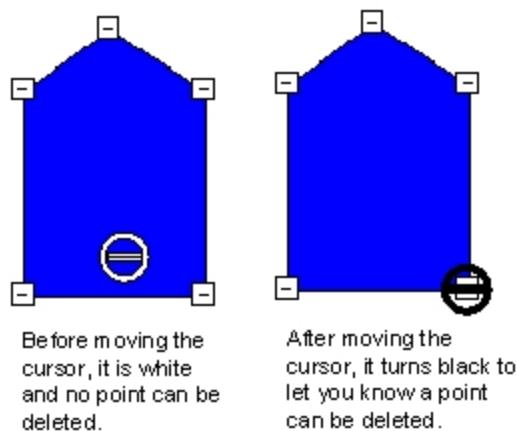
Adding and deleting points can be performed using a circular cursor. A plus sign inside the circle indicates that you are adding a point; a minus sign in the circle indicates that you are deleting a point.



#### *Adding a Point*

After you add a point, all the points in the object are displayed as small plus signs. You can click any of these plus signs and drag the mouse to adjust the size or position of the point it represents. This, in turn, changes the overall shape of the object.

Deleting a point is similar to adding a point, except the cursor changes to a circle with a minus sign inside. A black cursor means you can delete a point; a white cursor means you cannot. When the cursor is white, move it over the point you want to delete until it turns black. You can then delete that point. See the following figure.



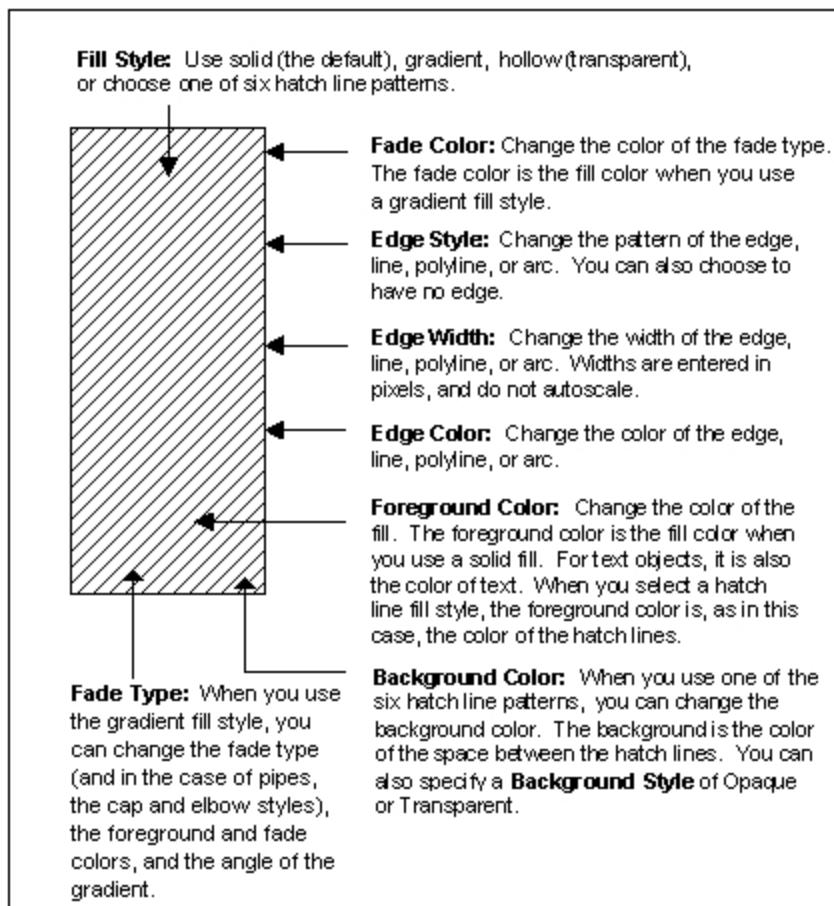
#### *Deleting a Point*

## Coloring and Styling Objects

Depending on the object you are working with, you can apply one or more of the following color and style properties to that object:

- Fade color
- Foreground color
- Background color
- Background style
- Edge color
- Edge style
- Edge width
- Fill style

The relationship of these properties is depicted in the following figure.



#### *Object Color and Style Properties*

The following table shows the color and style properties that can be changed for each object that you can add to a picture.

**Color and Style Properties**

Object	Foreground Color	Background Color	Background Style	Edge Color	Edge Style	Edge Width	Fill Style	Fade Type
Current	*	*	*	*	*	*	*	*

Time									
Current Date	*	*	*	*	*	*	*	*	*
Rectangle	*	*	*	*	*	*	*	*	*
Rounded Rectangle	*	*	*	*	*	*	*	*	*
Oval	*	*	*	*	*	*	*	*	*
Chord	*	*	*	*	*	*	*	*	*
Polygon	*	*	*	*	*	*	*	*	*
Pie	*	*	*	*	*	*	*	*	*
Pipe	*	*	*	*	*	*	*	*	
Arc				*	*	*			
Line				*	*	*			
Polyline				*	*	*			
Text	*	*	*	*	*	*	*	*	
Push Button									
OLE Object	*	*	*	*	*	*	*	*	
Data Link	*	*	*	*	*	*	*	*	*
Alarm Summary									
Variable Object									
Timer Object									
Event Object									
Charts	*	*		*	*				*
Bitmaps				*	*				

**NOTE:** If you apply an edge style other than solid, and then change the edge width to a value greater than 1, the edge style will not appear as defined in the Properties Window. This is because Microsoft Windows does not permit edge styles to be applied to edge widths greater than 1. Therefore, make sure your edge widths are no greater than 1 for lines that are not solid.

### Selecting Object Color and Style Properties

To select or change object properties for a shape, select the shape and do one of the following:

- Select a property from the object's pop-up menu.
- Select the object and then select the property from the Object menu.
- Select a property from the Shape Preferences dialog box.
- Change a property value in the Properties Window.
- Animate the object.

To set a property using the object pop-up menu, right-click the object in the picture (or by clicking the name in the system tree) and select the property from the pop-up menu. For more information on the pop-up menu and the options you have for each property, refer to the [Using the Object Pop-up Menu](#) section.

Depending on the object you are working with, specific property options are also available under the Object menu. To access these properties, select the object, and then select the appropriate property from the Object menu. When you do not have an object selected, the Object menu is disabled.

The following table lists the properties that are available from the Shape Preferences tabbed page on the User Preferences dialog box. This dialog box displays the default property value for new objects, unless that value is changed by any of the means outlined in this section.

### Shape Preferences

Preference	Function	Options
Color	Applies color properties to objects.	<ul style="list-style-type: none"> <li>• Fade Color</li> <li>• Foreground</li> <li>• Background</li> <li>• Edge</li> </ul> <p>For more information on selecting colors, refer to the <a href="#">Working with Color</a> section.</p>
Font	Applies a font to text.	<ul style="list-style-type: none"> <li>• Name</li> <li>• Size</li> <li>• Style</li> </ul> <p>For more information on selecting colors, refer to the <a href="#">Adding Text</a> section.</p>
Edge Style	Applies an edge style to lines in objects.	<ul style="list-style-type: none"> <li>• Solid</li> <li>• Dash</li> <li>• DashDot</li> <li>• DashDotDot</li> <li>• Dot</li> <li>• Null</li> <li>• Inside Frame</li> </ul>
Edge Width	Applies an edge width to lines in objects.	<p>Any width, entered in pixels.</p> <p><b>NOTE:</b> Edge widths do not autoscale.</p>
Fill Style	Applies a fill style to shapes.	<ul style="list-style-type: none"> <li>• CrossHatch</li> <li>• Diagonal CrossHatch</li> </ul>

		<ul style="list-style-type: none"> <li>• Downward Diagonal</li> <li>• Gradient</li> <li>• Hollow</li> <li>• Horizontal</li> <li>• Solid</li> <li>• Upward Diagonal</li> <li>• Vertical</li> </ul>
Hit Test Size	With Click and Stick enabled, determines the minimum distance the cursor can be from a shape before the shape can be selected (known as a <i>hit test</i> ).	Any logical units.
Background Style	Applies a background style to objects.	<ul style="list-style-type: none"> <li>• Opaque</li> <li>• Transparent</li> </ul>
Blend Percent	Applies a percentage of blending between the foreground color and the fade color.	Any number from 0 through 100.
Fade Type	Applies a fade type to shapes.	<ul style="list-style-type: none"> <li>• Concentric</li> <li>• Linear</li> <li>• Reflected</li> <li>• Radial</li> </ul>
Thickness	Applies a thickness to pipe objects.	Any thickness from 10 through 300 pixels.
Elbow Style	Applies an elbow style to pipe objects.	<ul style="list-style-type: none"> <li>• Round</li> <li>• Square</li> </ul>
Start Cap	Applies a cap style to the beginning of pipe objects.	<ul style="list-style-type: none"> <li>• Round</li> <li>• Square</li> <li>• Horizontal Diagonal</li> <li>• Vertical Diagonal</li> </ul>
End Cap	Applies a cap style to the end of pipe objects.	<ul style="list-style-type: none"> <li>• Round</li> <li>• Square</li> <li>• Horizontal Diagonal</li> <li>• Vertical Diagonal</li> </ul>
Remove Leading and Trailing Spaces	Removes extra spaces when Data links are displayed in the run-time environment.	<ul style="list-style-type: none"> <li>• Selected (default)</li> <li>• Cleared</li> </ul>

For more information on selecting properties using the Properties Window, refer to the [Controlling Object Properties](#) chapter. You can also dynamically change the color, fill, and edge styles of an object by animating it. For more information on animations, refer to the [Animating Object Properties](#) chapter.

## Aligning Objects

To help create and maintain attractive pictures, you can align objects to a grid or in relation to each other. The following sections show you how to align objects in your pictures.

### Aligning Objects to the Grid

Each picture maintains an invisible grid that you can use to align objects precisely as you create them. By enabling the Snap to Grid function, you can align objects with minimal effort, as objects stick (or snap) to the nearest grid point. When this function is disabled, you can align objects visually by displaying the grid and moving objects with the mouse, or by selecting the object you want to snap to a grid point and in Classic View, selecting Snap Objects to Grid from the Format menu. In Ribbon view, select the object, and on the Format tab in the Arrange group, in the Grid List, click Snap Objects to Grid.

When you display the grid, an evenly-spaced array of dots appear in the background of the picture. These dots represent the intersection of the grid lines, measured in pixels.

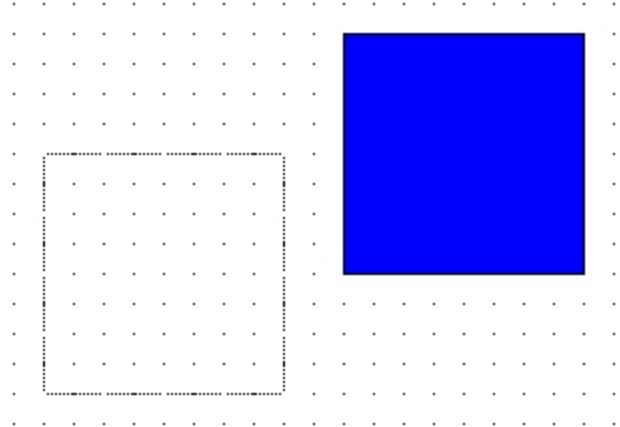
The Grid Settings dialog box lets you quickly set your options for using a grid. You can elect to show the grid, enable the Snap to Grid function, and define the grid's spacing using this dialog box. In Classic view, you can also select Snap to Grid from the Format menu, without using the Grid Settings dialog box. In Ribbon view, you can enable the Snap to Grid function from the Format tab, in the Arrange group, on the Grid list, by clicking Snap to Grid. If enabled, the Snap to Grid function works whether or not you display the grid. To disable Snap to Grid, deselect the Snap to Grid check box on the Grid Settings dialog box.

If enabled, the Snap to Grid function works whether or not you display the grid. To disable Snap to Grid, deselect the Snap to Grid check box on the Grid Settings dialog box.

Default settings for Grid Enable and Snap to Grid can be entered in the Picture Preferences tabbed page of the User Preferences dialog box.

**NOTE:** Snap to Grid does not work by nudging objects. You must use the mouse.

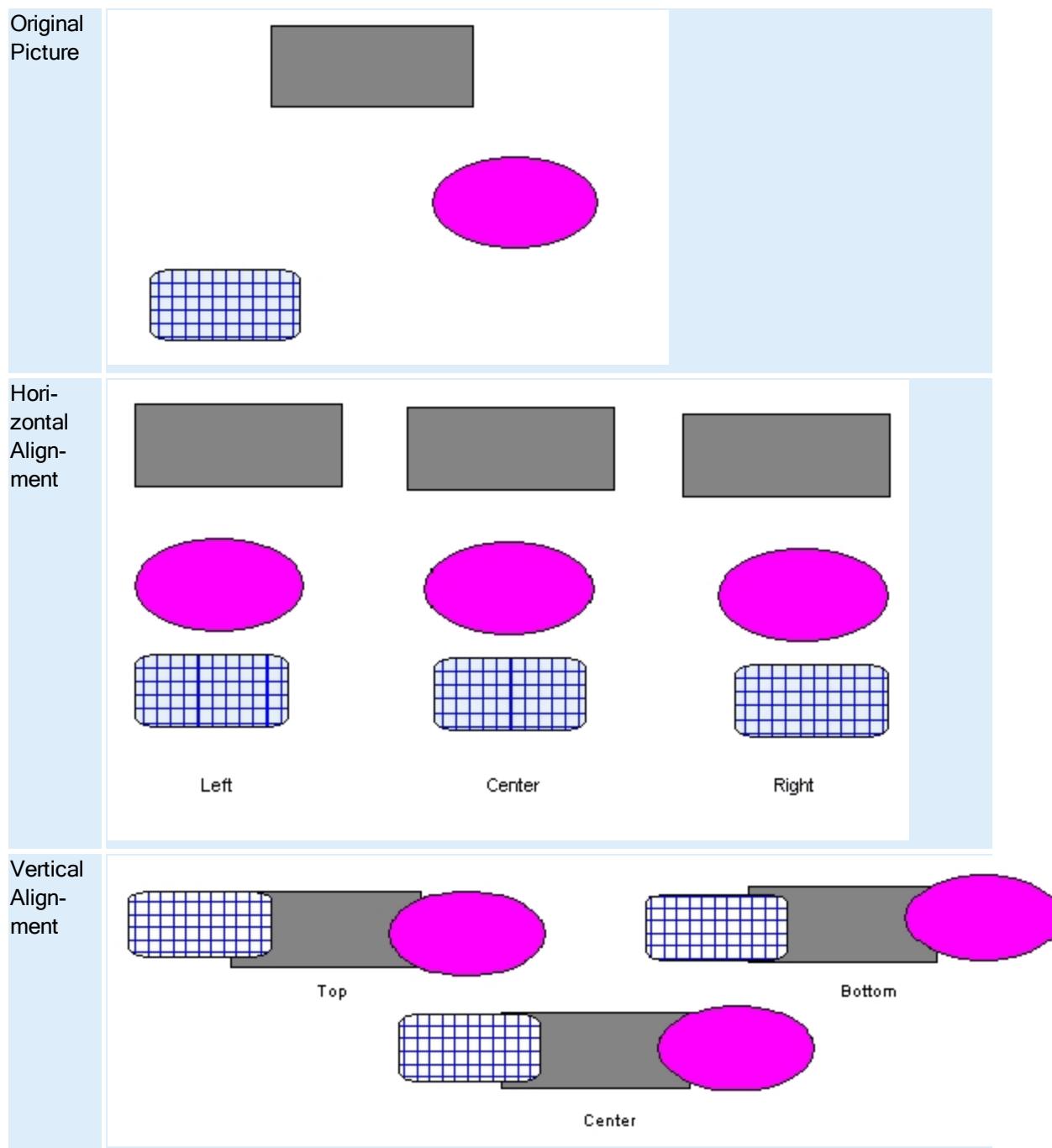
The following illustration shows an object moved with the grid displayed and Snap to Grid enabled. The box to the lower left shows the outline of the object as it is being moved to that position. Notice that the object sticks to the grid points.



*Aligning Objects to the Grid*

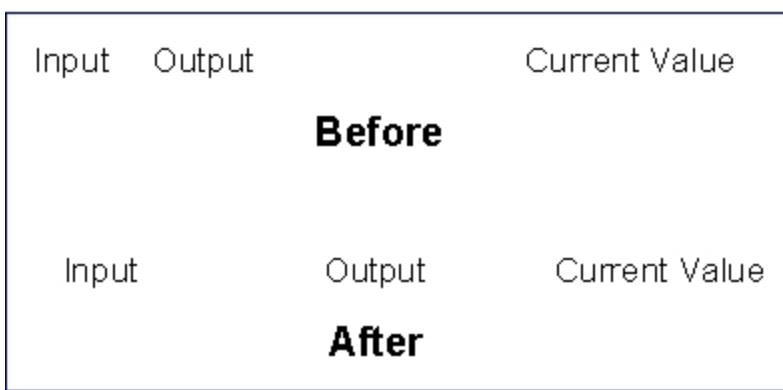
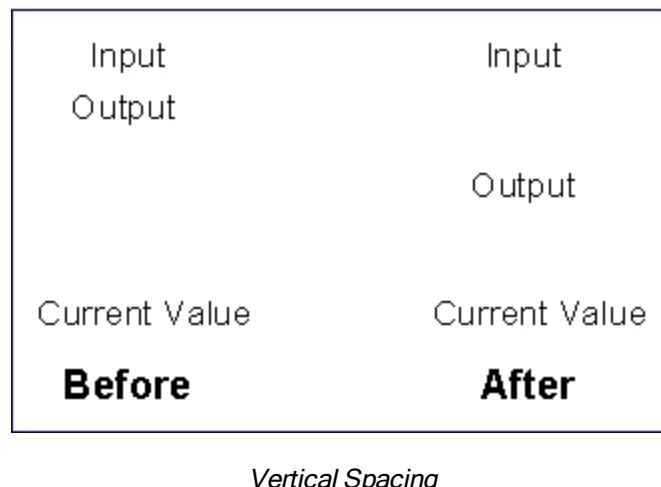
## Aligning Objects to Each Other

**IMPORTANT:** You can also align two or more objects in relation to each other using the Align buttons on the Tools toolbar or the Toolbox, if enabled. When using these buttons, you can vertically align the top, bottom, or center of the objects and horizontally align the left, right, or center of the objects, as the following figure shows. In Ribbon view, you can also align objects using options from the Align list, in the Arrange group in the Format tab.



### Spacing Objects in a Vertical or Horizontal Line

Another way you can align objects is to space them. In Classic view, you can space two or more objects vertically or horizontally with the Space Evenly Vertical and Space Evenly Horizontal buttons on the Tools toolbar. In Ribbon view, you may access these options on the Format tab, in the Arrange group, in the Space list. Both methods create an equal amount of spacing between each object; the difference is that vertical spacing creates rows, and horizontal spacing creates columns. Both types of alignment are illustrated in the following figure.



*Horizontal Spacing*

### Positioning and Scaling Objects

Another way to align objects in your picture is to *position* them. Positioning places the object where you want it, based on either relative or absolute alignment and the horizontal or vertical axis. In Classic view, you can position your objects using the Position Expert located on the Experts toolbar, or in Ribbon view from the Tools tab, in the Animations group, click Animations. If the Toolbox is enabled, click the button on the Toolbox. For help on the Expert fields, click the Help button on the Expert.

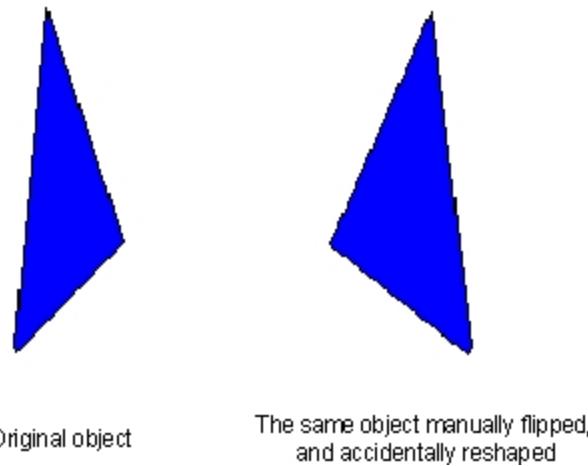
Alternately, you can *scale* an object. Scaling actually changes the dimensions of the object's height or width, as you specify. To scale an object, use the Scale Expert located on the Experts toolbar or the

Toolbox, if enabled, or in Ribbon view from the Tools tab, in the Animations group, click Animations. For help on the Expert fields, click the Help button on the Expert.

## Flipping Objects

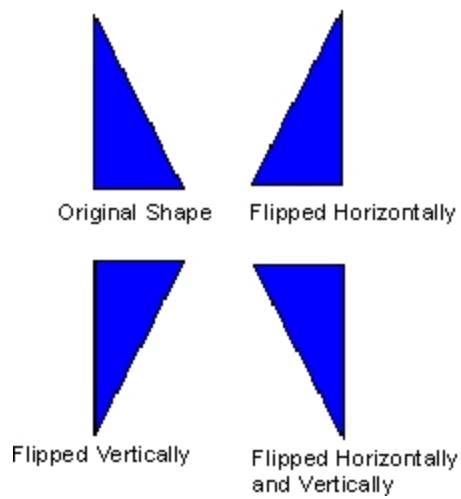
One simple way to change the way your objects appear in relation to each other is to flip them. When you flip an object, the object reflects along its vertical or horizontal axis and reappears as a mirror image of the original.

There are two ways to flip an object. You can flip an object simply by dragging a handle of an object from one side to its opposite side. The drawback to this approach is that it also stretches the object. The following figure shows a manually-flipped object that was accidentally reshaped.



*Flipping Objects Manually*

A more effective way to flip an object is to use the Flip Horizontal and Flip Vertical method. This method flips the object while maintaining its original size and shape. The following figure illustrates this effect.



*Flipping Objects Effectively*

## Splitting Polyline and Pipes

After you have created a polyline or pipe, you may decide that it is not exactly the shape you want. Or, you may want to insert another shape so that the polyline (or pipe) flows into and out of the new shape; for example, a pipe flowing in one end of a tank and out the other end.

You can split a polyline or pipe into two or more objects. The following sections show you how it's done.

### Split Polyline

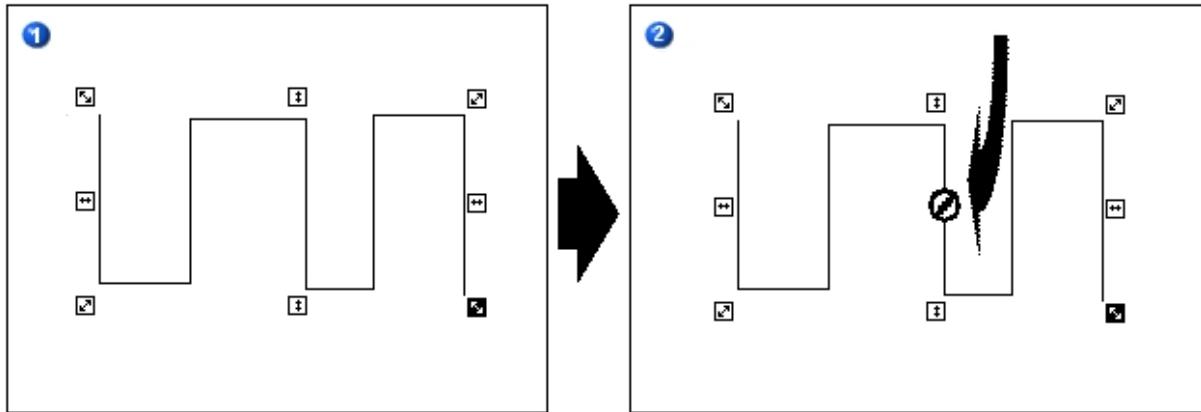


Figure 1 shows the selected polyline with reshape handles. In Figure 2, the arrow points to the splitting cursor, which turns black when it is close to the polyline.

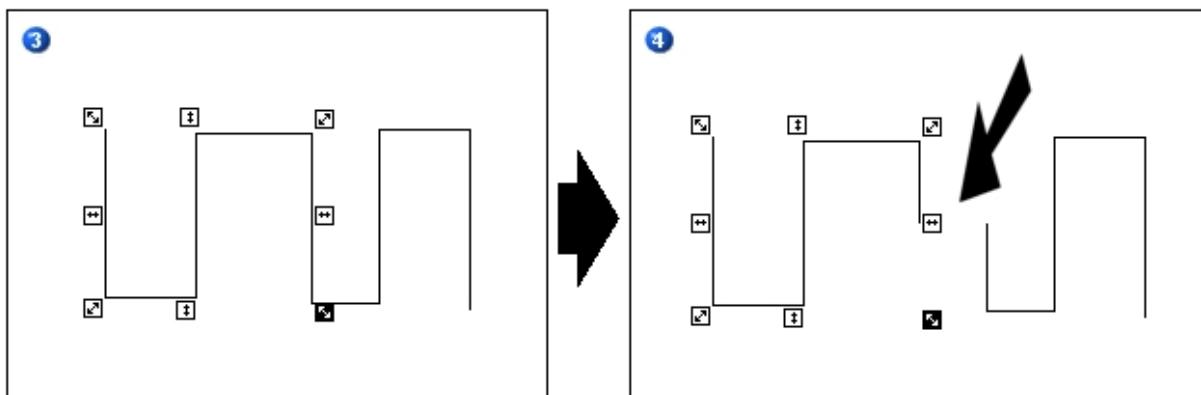


Figure 3 shows that the polylines still appear joined, however the reshape handles now surround only the polyline on the left. Figure 4 shows the polylines separated. You can now move the individual polylines around the picture or choose to delete one of them.

## Split Pipe

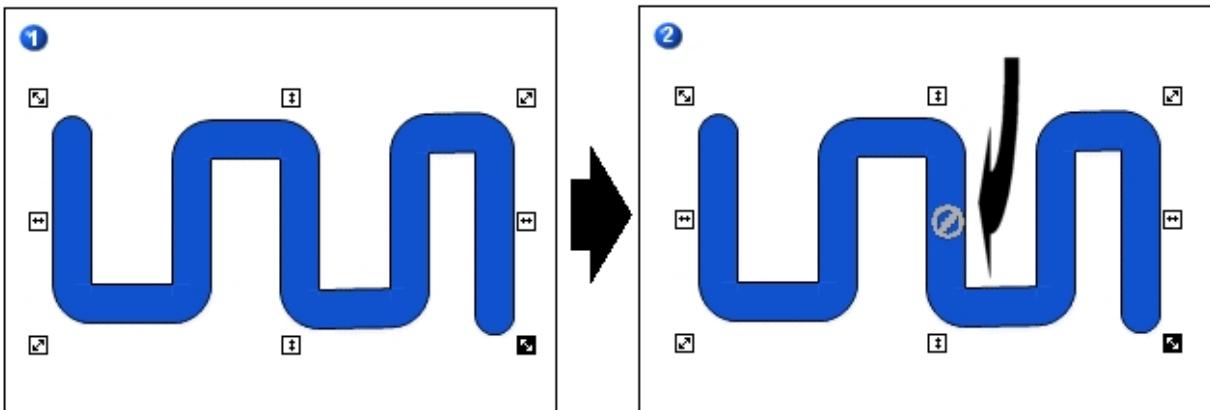
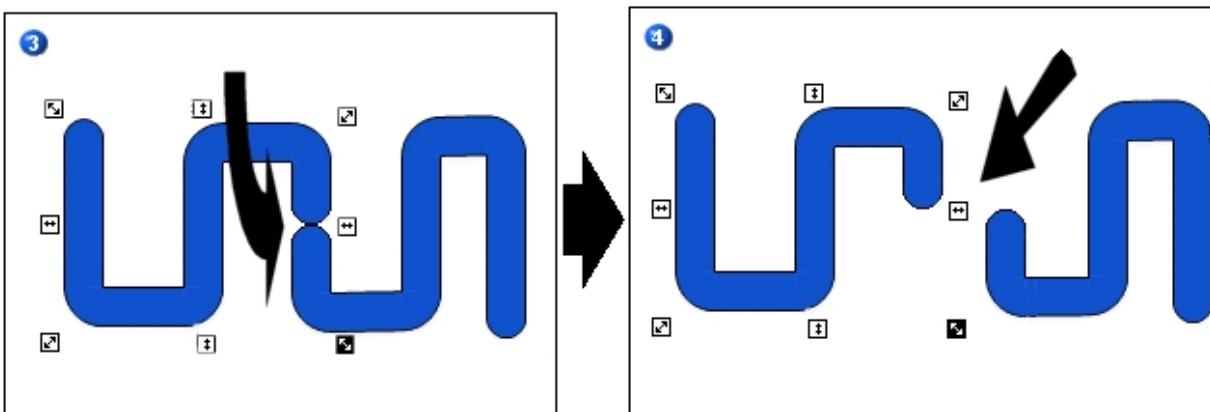


Figure 1 shows the selected pipe with reshape handles. In Figure 2 the arrow points to the splitting cursor, which changes to a contrasting color when the cursor is inside the pipe.

In Figure 3, the arrow points to the split you created in the original pipe object. Note that the reshape handles now surround only the pipe on the left. Figure 4 shows the pipes separated. You can now move the individual pipes around the picture or choose to delete one of them.



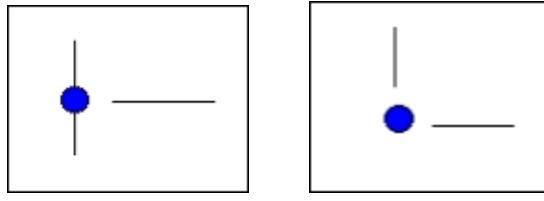
**NOTE:** When you split a polyline or pipe, you create a new object. Therefore, if you undo a polyline or pipe split, the new object is deleted first and you must perform a second undo action to revert to the original object.

## Extending Lines to Intersect

Joining two or more lines can be tedious and time-consuming if it is done manually and if there are many lines in your picture that need to be joined. Using the Extend Lines button on the CAD Toolbar (Classic view) or Extend Lines, in the Drawing Tools list, in the Picture group, on the Format tab (Ribbon view), you can easily extend single or multiple lines to an intersection point.

**NOTE:** You can intersect lines in configuration mode only.

There are two types of intersection points:



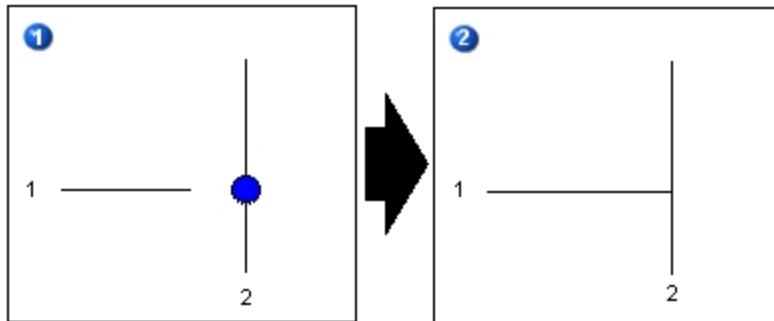
on-line off-line

### Intersecting Lines to a Single Intersection Point

Each intersection of lines can involve only two lines whether the intersection point is on-line or off-line. If you select more than two lines, then more than one intersection point is involved and a separate operation for each intersection is required. For more information about intersecting multiple lines to multiple intersection points, see [Intersecting Lines to Multiple Intersection Points](#).

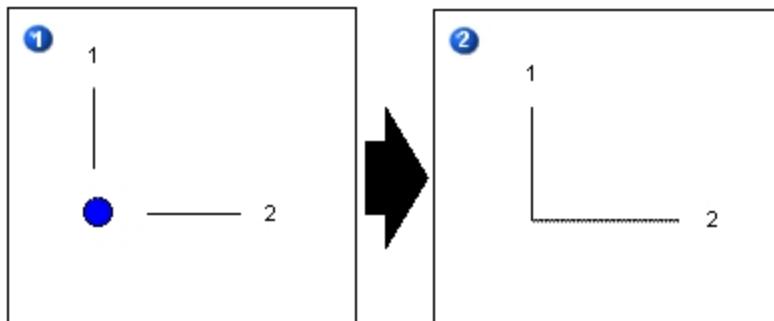
#### Example 1: On-line intersection point

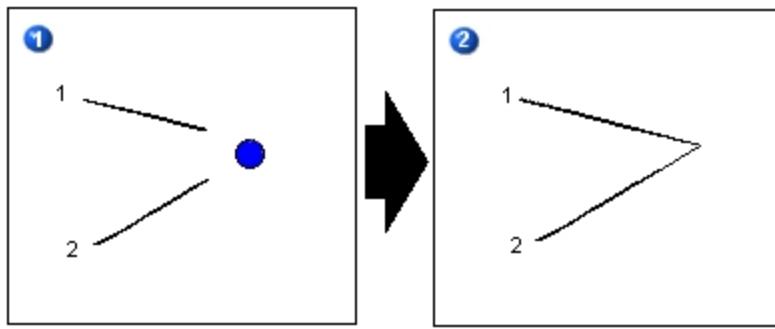
The following diagrams show an example of extending and intersecting a single line (line 1) with the intersection point located on another line (line 2). This is an example of an on-line intersection point.



#### Example 2: Off-line intersection points

The following diagrams show examples of extending and intersecting two lines (lines 1 and 2) with an intersection point that is not located on either source line (off-line). When the intersection point of two lines is found at a point off the two source lines, both lines are extended to the intersection point.





**IMPORTANT:** Lines may appear to be perfectly vertical or horizontal, but if they are even slightly off, they will extend well beyond the boundaries of your computer screen. In the following diagram, the "horizontal" lines were extended to the intersection points on the vertical line, but also extend to the right, past the edge of the viewing area on the computer screen.



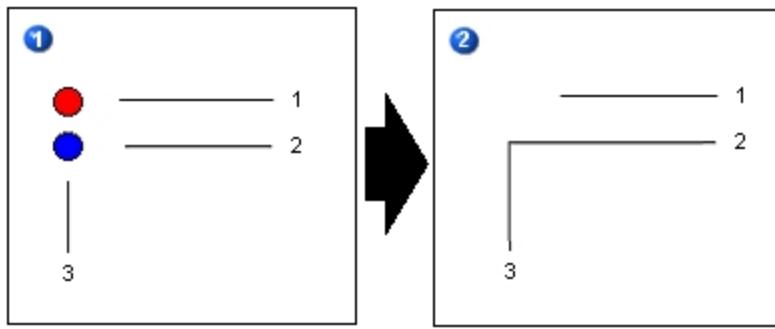
For this reason, it is best to use the Make lines horizontal and/or Make lines vertical buttons on the CAD Tool-bar (Classic View) or from the Format tab, in the Picture group, in the Drawing Tools list (Ribbon view) before extending lines to the intersection points. For more information, see [Making Lines Horizontal or Vertical](#).

### Intersecting Lines to Multiple Intersection Points

In cases where there is more than one potential intersection point, the closest intersection point is always used. However, an on-line intersection point always takes precedence over an off-line intersection point, regardless of its proximity to the intersecting lines, and the number of lines and intersection points. The following diagrams show examples of these rules.

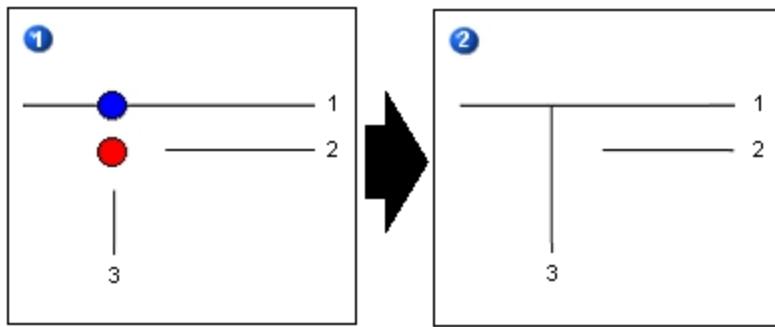
#### Example 1: No on-line intersection point

In the first example, the blue circle indicates the closest of the two intersection points, and because there is no on-line intersection point, only lines 2 and 3 are extended to the closest intersection point. Line 1 does not intersect with line 3.



#### Example 2: On-line and off-line intersection points

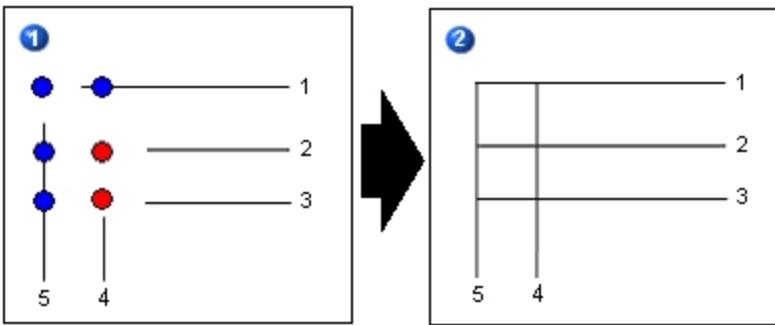
In this example, the blue circle indicates the on-line intersection point, and because on-line intersection points take precedence over off-line intersection points, line 3 is extended to the on-line point on line 1. Line 2 does not intersect with line 3.



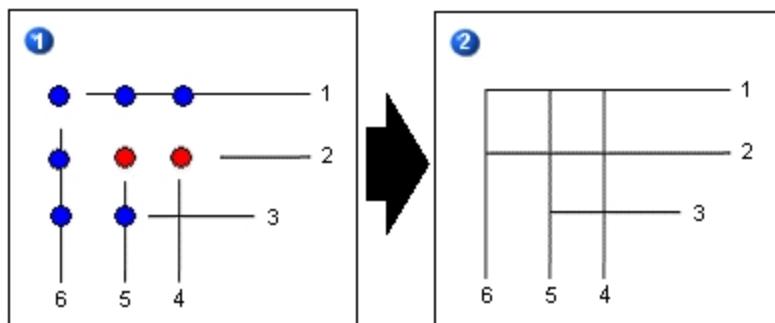
#### Example 3: On-line and off-line intersection points

The following diagrams provide examples of extending multiple lines.

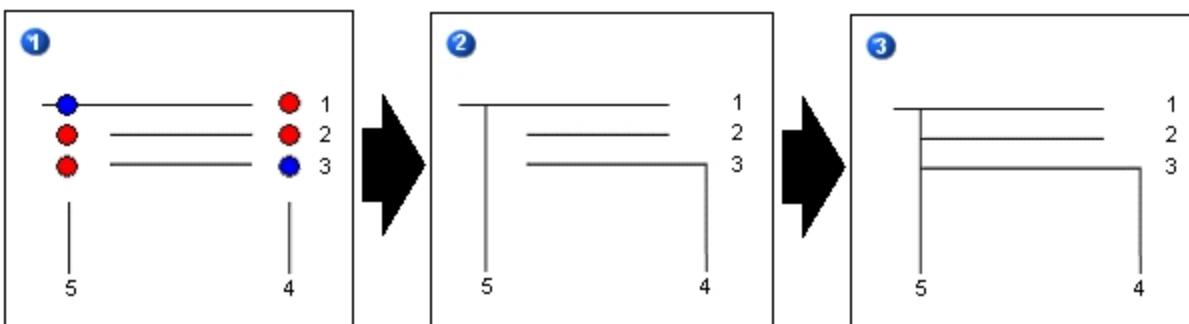
In the following example, lines 1 and 5 connect with the off-line intersection point (in the upper left corner), because there is no on-line point to take precedence. Line 4 goes through the off-line intersection points to connect with the on-line point on line 1 and lines 2 and 3 go through the off-line points to connect with the on-line intersection points on line 5.



In the next example, lines 1 and 6 connect with the off-line intersection point (in the upper left corner), because there is no on-line point to take precedence. Lines 2, 4, and 5 go through the off-line points to the on-line points on lines 6 and 1. Line 3 connects only with the first on-line intersection point on line 5.



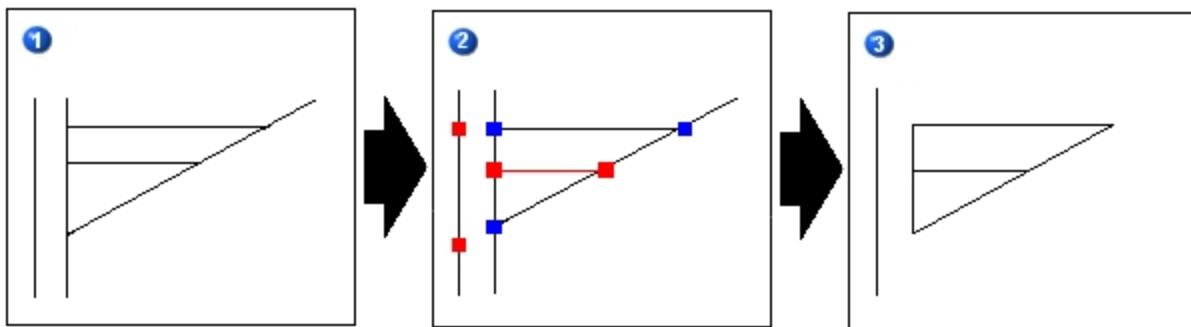
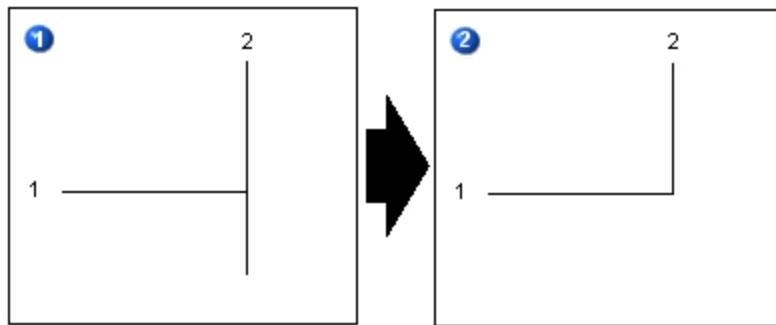
The final example below, shows line 5 going through the off-line intersection points (red circles) to the on-line intersection point in the top left corner on line 1. Lines 3 and 4 intersect at the off-line point on the right because there is no on-line intersection point to take precedence. If you click the Extend Lines button again, lines 2 and 3 are extended to line 5 where on-line intersection points exist.



### Trimming Lines at the Intersection



After you have intersected lines in your picture, you can trim the intersected lines to remove unnecessary portions. Trimming lines can be tedious and time-consuming if it is done manually and if there are many lines in your picture that need to be trimmed. Using the Trim Lines button on the CAD Toolbar (Classic view) or Trim Lines in the Drawing Tools list, in the Picture list, in the Picture group, on the Format tab (Ribbon view), you can easily trim single or multiple lines. The following diagrams show examples of trimmed intersected lines.



**NOTE:** Regardless of the trim option set in the User Preferences dialog box, the shortest portion of the line from the intersection point will always be trimmed first.

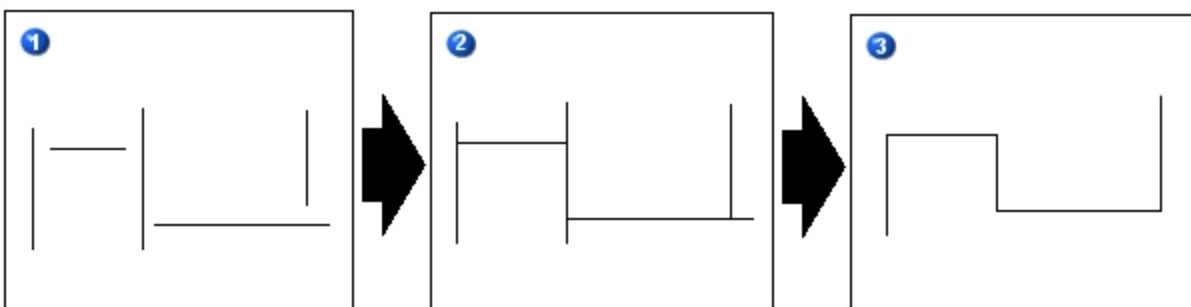
## Converting Lines to Polyline



Joining multiple lines to create a polyline can be tedious and time-consuming if it is done manually. Using the Convert Lines to Polyline button on the CAD Toolbar, (Classic view) or Convert Lines to Polyline, in the Drawing Tools list, in the Picture list, in the Picture group, on the Format tab (Ribbon view), you can easily draw the individual lines required and convert them to a polyline. You can create single or multiple polylines.

### Converting lines to a single polyline

The following diagrams show an example of creating a single polyline from individual lines.



The lines are drawn, as in Figure 1, and then all are selected. When you click the Convert Lines to Polyline button, it extends the lines (as shown in Figure 2), and then it trims the lines (as shown in Figure 3). For more information, refer to [Extending Lines to Intersect](#) and [Trimming Lines at the Intersection](#).

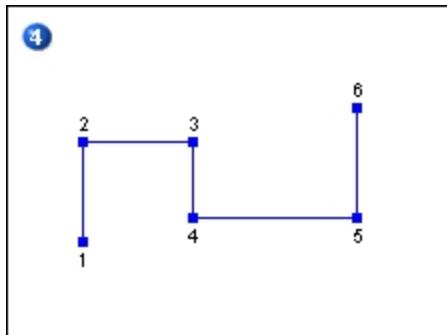
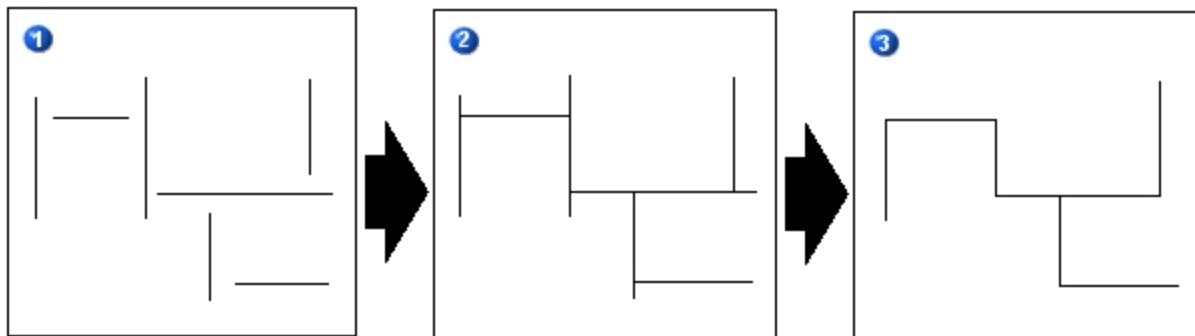


Figure 4 shows the points of the polyline. The points of a polyline are determined when two lines are connected and have the same intersection point at the start or end point.

### Converting lines to multiple polylines

The following diagrams show an example of creating multiple polylines from individual lines.



As with converting lines to a single polyline, the selected lines are first extended to the intersection points and then trimmed. In this example, two polylines have been created.

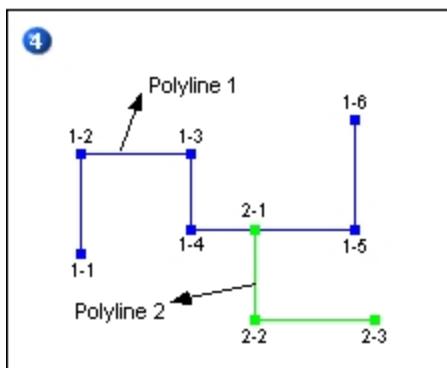


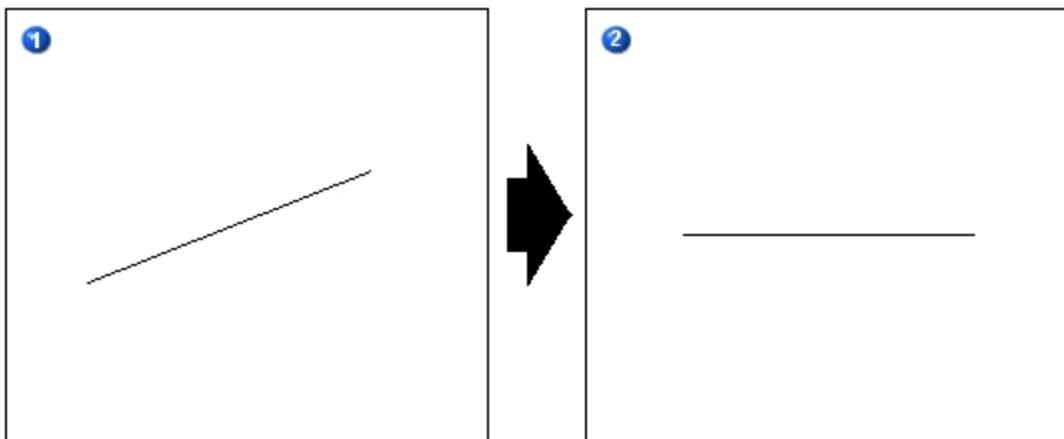
Figure 4 shows the points of each polyline; that is, points 1-1 through 1-6 are the points of Polyline 1 and points 2-1 through 2-3 are the points of Polyline 2. The points of a polyline are determined when two lines are connected and have the same intersection point at the start or end point.

## Making Lines Horizontal or Vertical

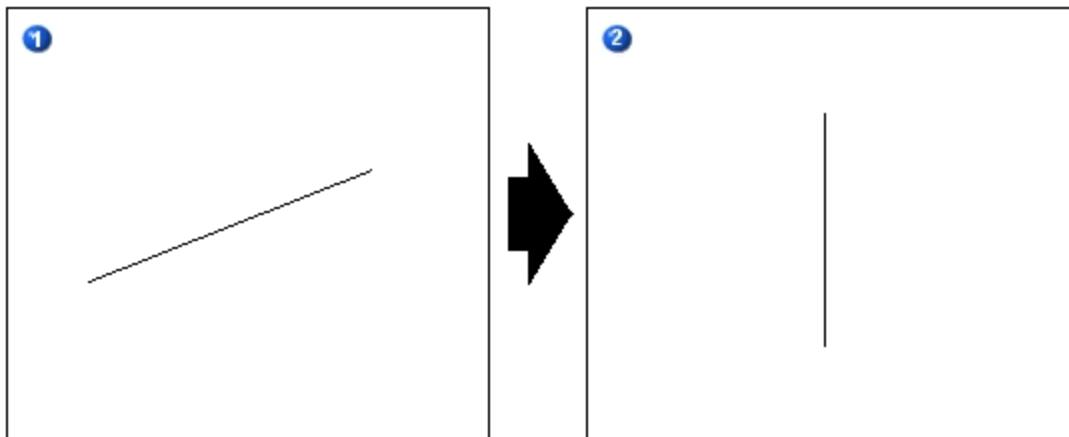


Drawing straight horizontal or vertical lines can be tedious and time-consuming if done manually. Using the Make Lines Horizontal or Make Lines Vertical buttons on the CAD Toolbar, (Classic view) or Make Lines Horizontal or Make Lines Vertical, in the Drawing Tools list, in the Picture group, on the Format tab (Ribbon view), you can easily change the position of your lines. The following diagrams show examples of making lines horizontal and vertical.

### Make Line Horizontal



### Make Line Vertical



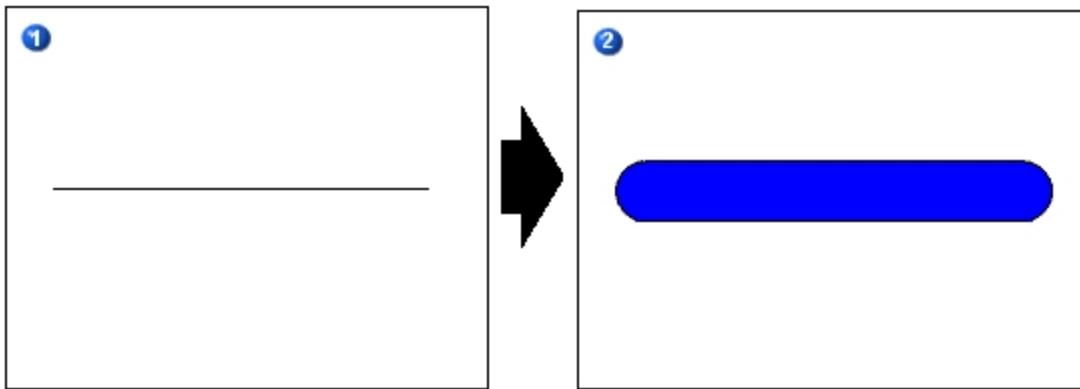
## Converting Lines and Polylines to Pipe



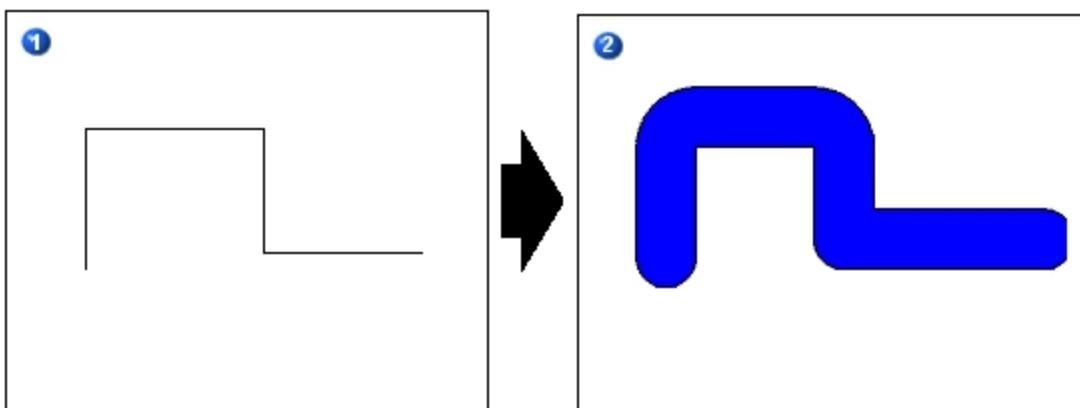
Creating pipe objects from lines and polylines is simplified using the Convert Lines and Polylines to Pipe button on the CAD toolbar (Classic View) or Convert Lines and Polylines to Pipe, in the Drawing Tools list, in the Picture group, on the Format tab (Ribbon view). Create the required lines and polylines, or select existing lines and polylines, then convert them to pipes.

The new pipe object inherits the property values, animation settings, and VBA scripts from the original line/polyline object. The pipe-specific properties have the default values configured in the User Preferences dialog box. You can change the pipe-specific properties using the [Modify Pipe Characteristics](#) dialog box.

The following diagrams show examples of converting lines and polylines to pipes.



**Single Line Line Converted to Pipe**



**Polyline**

**Polyline Converted to Pipe**

## Modifying Pipe Characteristics

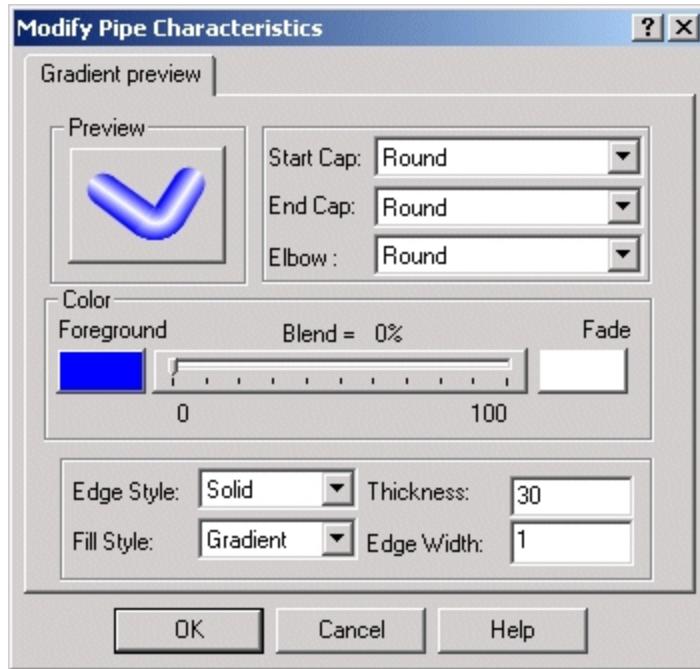
You can modify the characteristics of pipe objects by using either the Modify Pipe Characteristics dialog box, or the Select Color dialog box when you choose Fade from the Color pop-up menu. The same pipe properties are available on both dialog boxes.

To access the Modify Pipe Characteristics dialog box, use one of the following methods:

- Right-click a pipe object and choose Modify Pipe Characteristics.
- Select one or more pipe objects and click the Modify Pipe button on the CAD Toolbar, if it is enabled (Classic view).
- Select one or more pipe objects and on the Format tab, in the Styles group, from the Pipe Styles list, click Modify Pipe Characteristics (Ribbon view).

To access the Select Color dialog box, right-click a pipe object, point to Color and choose Fade. Whichever dialog box you choose to access, you can define the same characteristics for your pipe objects.

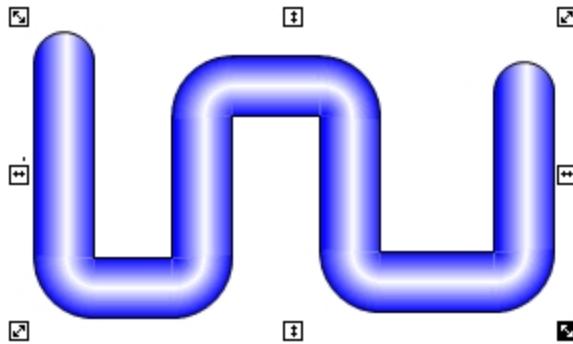
**NOTE:** If you select multiple pipe objects, you cannot access these dialog boxes with the right-click pop-up menu. You can, however, use the Modify Pipe button on the CAD Toolbar (Classic view) or Modify Pipe Characteristics in the Pipe Styles list, in the Styles group on the Format tab (Ribbon view) to change characteristics of multiple pipe objects, as shown in the following illustration.



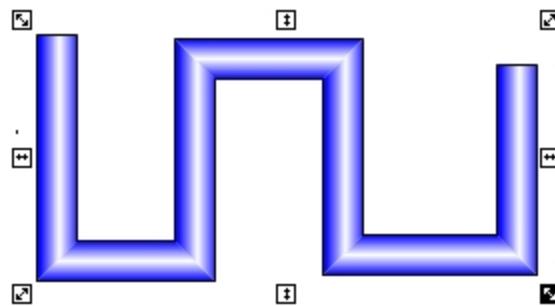
In these dialog boxes you can change the appearance of the selected pipes, including the foreground and fade colors, blend percentage, edge and fill styles, thickness and edge width, the appearance of the start and end caps, and elbow style. If you select more than one pipe, the changes are applied to all pipes. Note that if you select Gradient as the fill style, the only fade type available for pipe objects is reflected.

The following diagrams show different combinations of cap and elbow styles.

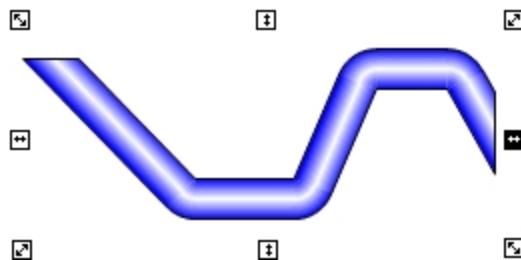
**NOTE:** Elbow styles must be either all round or all square; you cannot mix elbow styles on a single pipe object.



Round start caps, end caps, and elbows



Square start caps, end caps, and elbows



Horizontal diagonal start cap, Vertical diagonal end cap, and round elbows

## Adding and Deleting Connection Points



Connection points are used to anchor connectors to shapes in your pictures.

If the Always Show Connection Nodes check box on the User Preferences dialog box is selected, the default connection points and points that you add to shapes are always visible. If this check box is cleared, the connection points are not visible, but can be displayed using one of the following methods:

- Select a connector and move it towards the shape to anchor it to a certain connection point on the shape.

- Or -

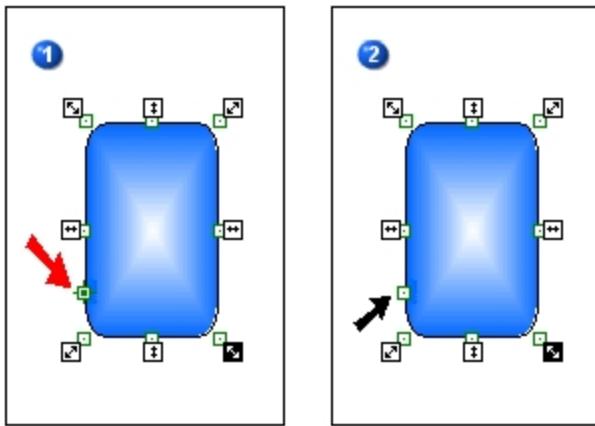
- Select the shape and click either the Add Connection Point button or Delete Connection Point button on the CAD Toolbar.



## Adding Connection Points

You can add new connection points to a shape or use the [default connection points](#) to anchor a connector. For more information about anchoring, refer to [Using the Connector Tools](#).

The following diagrams show you how to add connection points.



In Figure 1, the red arrow points to the Add Connection Point cursor that appears when you are adding a connection point. The black arrow in Figure 2 points to the new connection point.

**NOTE:** The shape you are adding a connection point to must be selected. Reshape handles appear around the shape when it is selected.

### Default Connection Points

Most shapes are provided with default connection points and allow you to add custom connection points. The following table lists the different shapes, the number of default connection points and the number of custom connection points that can be added.

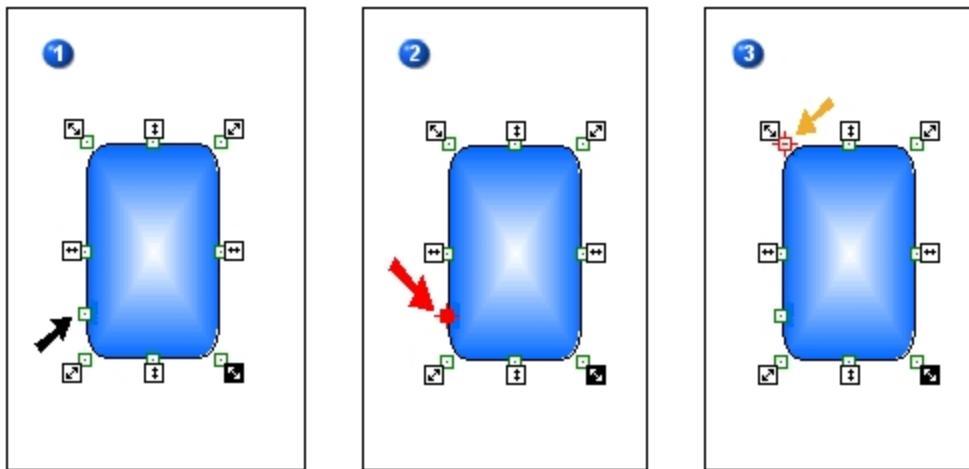
Object	Default Connection Points	Custom Connection Points
Pipes, Lines, Polylines	0	0
Arcs	3	0
Pies, Chords	3	13
Text, Datalink	8	8
Rectangles, Round Rectangles, Ovals, Polygons	8	8
Line Connector, Right Angle Line Connector, Pipe Connector	2	0

**NOTE:** Pipes, lines, and polylines display connection nodes only at their end points and only when a connector object attempts to connect or is connected to the object. At no other time are connection nodes visible for these objects, regardless of whether the Always Show Connection Nodes check box is selected.



### Deleting Connection Points

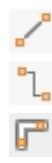
You can delete connection points that you add to a shape but you cannot delete default connection points. The following diagrams show you how to delete a connection point.



In Figure 1, the black arrow points to the custom connection point you added. The red arrow in Figure 2 points to the Delete Connection Point cursor that appears when you move the cursor over a custom connection point. The gold arrow in Figure 3 points to the cursor that appears when you move the cursor over a default connection point, to indicate that the connection point cannot be deleted.

**NOTE:** The shape you are deleting a connection point from must be selected. Reshape handles appear around the shape when it is selected.

## Using the Connector Tools

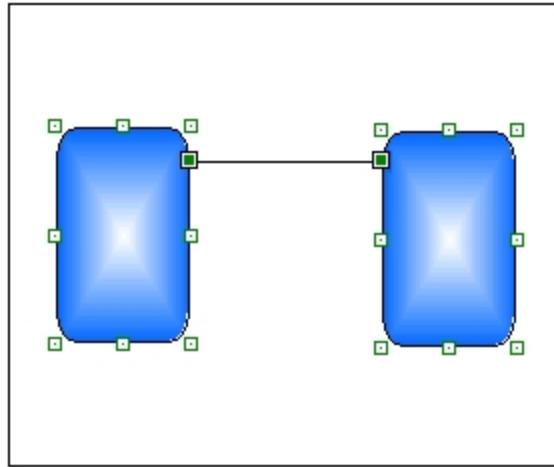


Connectors are used to connect two shape objects together. This is helpful when you want to move your shapes around the picture but keep them connected. If only one of the connector's ends is anchored to a shape object, whenever that shape is moved, the connector object follows it. If both ends of the connector are anchored to two shapes, it will stretch or shrink itself when one of the shapes is moved or resized.



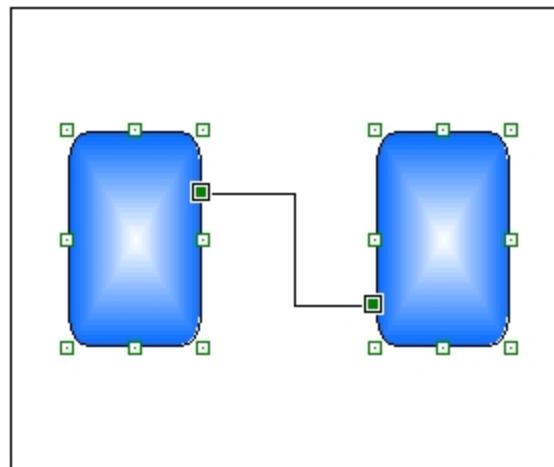
### Line Connector

The Line Connector tool allows you to draw a straight line to connect two shapes, as illustrated in the following figure.



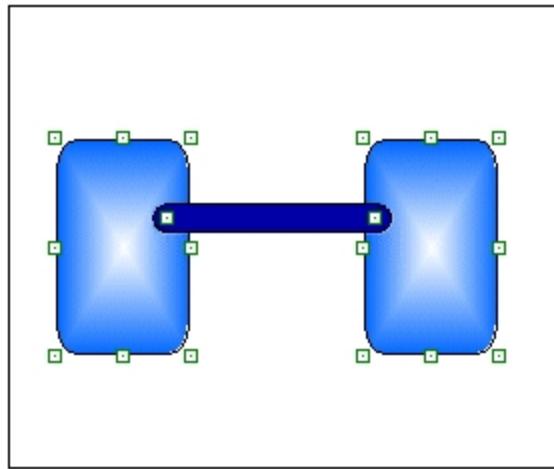
#### Right Angle Line Connector

The Right Angle Line Connector tool allows you to draw a right angle line to connect two shapes, as illustrated in the following figure.



#### Pipe Connector

The Pipe Connector tool allows you to draw a pipe connector between two shapes, as illustrated in the following figure.



## Moving Connectors

You can move your connector to any position simply by selecting it and dragging it to a spot anywhere in the picture. However, there will be times when you want to be more precise about positioning the connector. There are a number of ways you can do this:

- [Click and drag a connector handle](#)
- [Hold down the CTRL key and click and drag a connector handle](#)
- [Use the arrow keys](#)
- [Hold down the SHIFT key and use the arrow keys](#)
- [Hold down the CTRL key and use the arrow keys](#)
- [Hold down the SHIFT + CTRL key and use the arrow keys](#)
- [Use the + or - keys to rotate](#)
- [Use the SHIFT and + or - key to rotate](#)

Using the SHIFT or CTRL keys, or a combination of both, while moving, scaling, or rotating your connectors provides you with an extra level of precision when performing these actions. You can change that level of precision by changing the settings for these actions by increasing or decreasing the number of pixels or degrees your connector moves, scales, or rotates. For more information about changing these settings, see the Changing the Nudge Settings section in [Changing Picture Settings in the FixUserPreferences.ini file](#).

### Click and Drag a Connector Handle

When you click and drag a connector handle, only the selected end of the connector moves as you drag it, and the connector itself is stretched or shrunk, depending on how you move the connector. When you release the mouse button, the connector handle is placed at that position. However, if you place the connector handle near a connection point on an object, the connector handle snaps to that connection point. This is very useful when anchoring a connector. For more information about anchoring, see [Anchoring Connectors](#).

#### **CTRL + Click and Drag a Connector Handle**

When you press the CTRL key and click and drag a connector handle the connector is moved, stretched, or shrunk similar to clicking and dragging; however, when you hold down the CTRL key and drag the connector in an arc formation, the connector only moves in 15 degree increments. That is, as you drag the connector handle through a 90 degree arc, there are only six positions it can be dropped on. As you drag it through 180 degrees, there are 12 positions it can be dropped on, and so forth.

If you drop the connector handle near a connection point on an object when you are holding down the CTRL key, it will not snap to the connection point; it will simply drop at the indicated position. If you want the connector handle to snap to a connection point, you must click and drag it without using the CTRL key.

#### **The Arrow Keys**

Use the arrow keys to move the connector horizontally and vertically in the picture. The number of pixels the connector moves each time you press an arrow key depends on the SlowNudgeMoveOffset setting in the FixUserPreferences.ini file.

#### **SHIFT + the Arrow Keys**

When you press the SHIFT key and one of the arrow keys, the connector moves horizontally or vertically, depending on the arrow key used. The number of pixels the connector moves is defined in the FastNudgeMoveOffset setting in the FixUserPreferences.ini file.

#### **CTRL + the Arrow Keys**

When you press the CTRL key and the up or down arrow keys, the connector moves or scales vertically, depending on the position of the connector and the arrow key used. If you press the left or right arrow key while pressing the CTRL key, the connector moves or scales horizontally. For example, if you draw a horizontal connector, it will move vertically when you use the up or down arrow key with the CTRL key, and will scale horizontally when you use the left or right arrow key with the CTRL key. If you draw a vertical connector, it will scale vertically when you use the up or down arrow key with the CTRL key, and will move horizontally when you use the left or right arrow key with the CTRL key.

When scaling the connector, only the end moves. For example, if you draw a pipe connector from left to right, the right side of the connector (the end) stretches or shrinks when you use the CTRL key and left or right arrow key. If you rotate the connector 180 degrees, the left side becomes the end and the connector will be scaled from that side. The number of pixels the connector moves or is scaled when you use the CTRL key with the arrow keys depends on the SlowNudgeMoveOffset and SlowNudgeScaleOffset settings in the FixUserPreferences.ini file.

#### **SHIFT + CTRL + the Arrow Keys**

When you press SHIFT + CTRL and one of the arrow keys, the connector moves or scales horizontally or vertically, depending on the position of the connector and the arrow key used. For example, if you draw a horizontal connector, it will move vertically when you use the up or down arrow key with the SHIFT + CTRL keys, and will scale horizontally when you use the left or right arrow key with the SHIFT + CTRL keys. If you draw a vertical connector, it will scale vertically when you use the up or down arrow key with the SHIFT + CTRL keys, and will move horizontally when you use the left or right arrow key with the SHIFT + CTRL keys. The number of pixels the connector moves or scales when you use the SHIFT + CTRL keys with the arrow keys depends on the FastNudgeMoveOffset and FastNudgeScaleOffset settings in the FixUserPreferences.ini file.

### The + or - keys

Use the + or - keys to rotate your connector. When you right-click the object and choose Rotate, four rotate handles appear around the object. Use the + key on the number keypad to rotate the connector in a counter clockwise direction; use the - key on the number keypad to rotate the connector in a clockwise direction. The number of degrees the connector rotates each time you press the + or - key depends on the SlowNudgeRotateOffset setting in the FixUserPreferences.ini file.

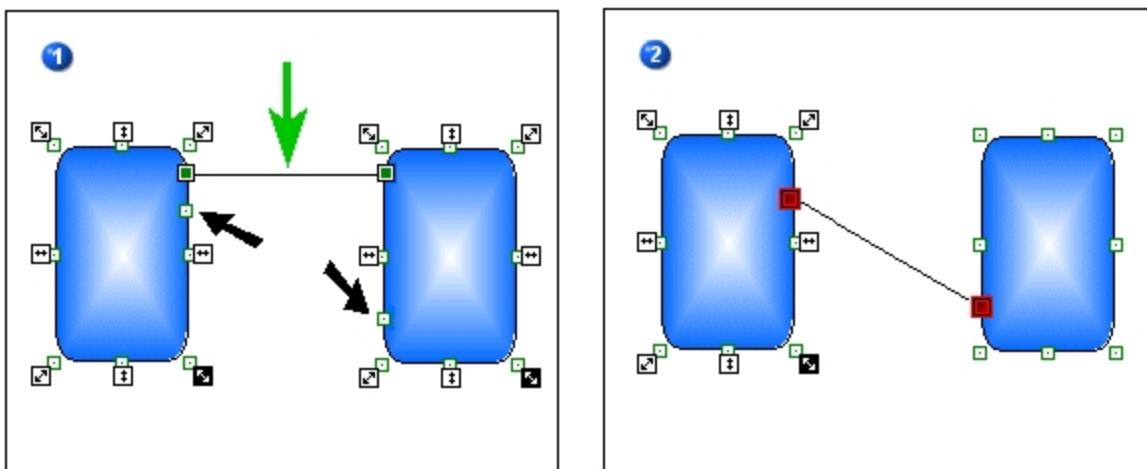
### SHIFT and + or - key

When you press the SHIFT key and either the + or - key, the connector rotates either counter clockwise or clockwise, depending on the key used. The number of degrees the connector moves is defined in the FastNudgeRotateOffset setting in the FixUserPreferences.ini file.

### Anchoring Connectors

You must add connection points to shapes or use the default connection points to anchor the connector. Anchoring a connector allows you to move the shapes around the picture until you are satisfied with their locations, while keeping them connected. The connector stretches and reshapes itself as you move or resize the shapes.

The following diagrams show you how to anchor a connector.



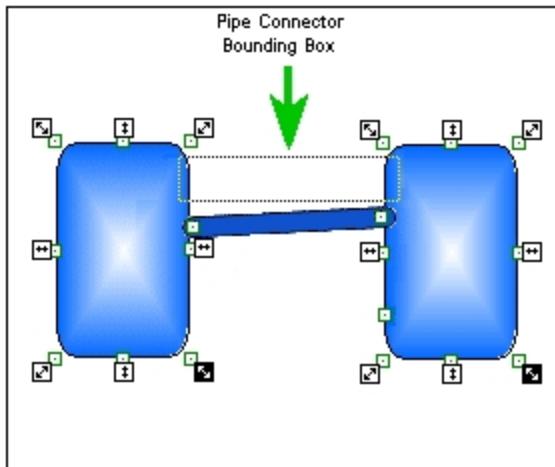
In Figure 1, the green arrow points to the line connector and the black arrows point to connection points you added. For information about adding connection points, refer to [Adding and Deleting Connection Points](#).

Figure 2 shows the anchored connector. When you select the connector and move the cursor over the handles, the cursor becomes a crosshair. Click and drag each connector handle to a connection point. The handles change to red and black when the connector is anchored.

**NOTE:** You can anchor a connector to default connection points.

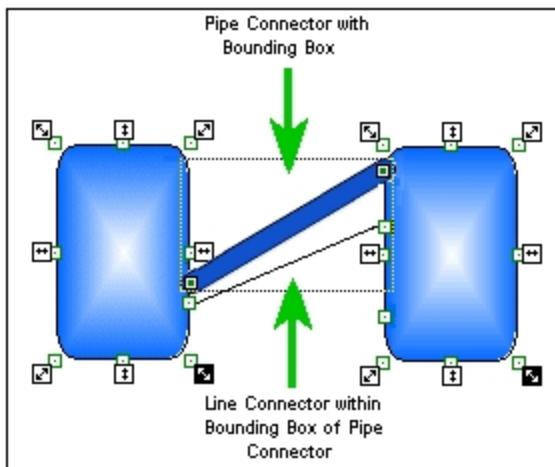
### Connected Shapes that Overlap

All shapes have a bounding box that defines the outside boundary of the shape. The bounding box is visible when a shape is selected and dragged. The following picture shows the bounding box of a pipe connector that is being moved. Only the bounding box moves while you're dragging the connector. When you let go of the mouse button, the shape then moves and the bounding box disappears.



As you add shapes to your picture, the shape that was drawn last is always placed "on top." This means that the bounding box of the newest shape may overlap an existing shape. When you are adding pipe and line connector shapes to your picture, this overlap can prevent you from selecting the previously drawn shape.

For example, you have anchored both a pipe connector and a line (or right angle line) connector to two shapes, and the bounding box of the pipe connector is on top because you drew it last. As the following picture shows, the line connector is positioned within the pipe connector's bounding box; therefore, you cannot select it.



You must either move the pipe connector so that its bounding box no longer overlaps the line connector or right-click the pipe connector and choose Send to Back. This allows you to select and move the line connector and anchor it to the desired connection points.

**NOTE:** To allow shapes to be selectable at all times, regardless of the location of a shape's bounding box, clear the Always Show Connection Nodes check box on the Drawing Options tab of the User Preferences dialog box.

## Creating Complex Objects

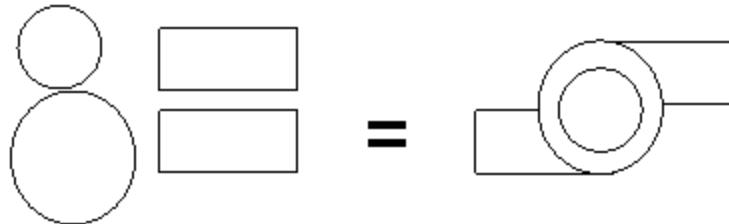
One of the most powerful features in iFIX is the ability to easily create complex objects from simple ones. Because iFIX uses object-oriented graphics in an open picture environment, you have the flexibility to develop more intuitive pictures with a few clicks of the mouse. The ways you can manipulate objects to design advanced pictures include:

- [Stacking](#)
- [Bringing to Front and Sending to Back](#)
- [Layering and Visibility](#)
- [Grouping and ungrouping](#)

## Stacking

*Stacking* allows you to place one object on top of another so that it forms a more complex, multi-dimensional figure.

It is an effective method for taking simple, existing objects and forming more intuitive ones. For example, by stacking two ovals and two rectangles, you can create a picture that resembles a pump, as depicted in the following figure.

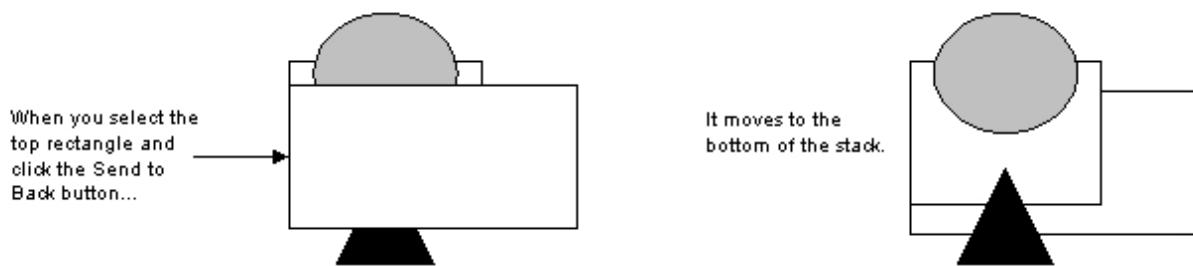


To form more precise connections, such as the two rectangles meeting flush with the edge of the outside circle in the figure above, try nudging the object exactly where you want it. For more information on moving objects and nudging, refer to the [Moving Objects](#) section.

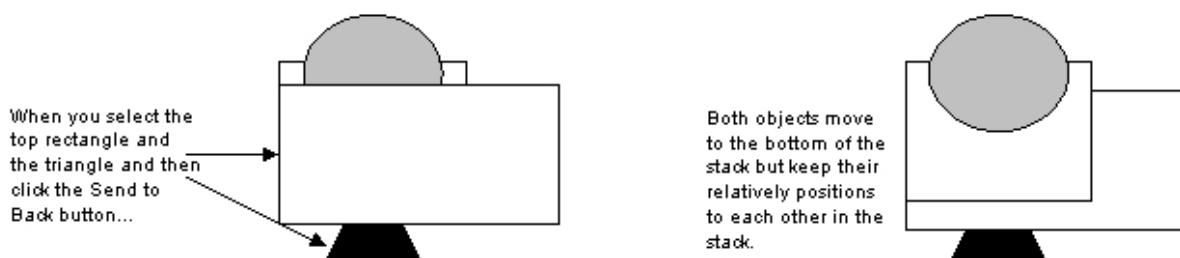
You can stack as many objects as you want. The object on top does not have to cover the other object completely and does not alter its properties.

## Bringing to Front and Sending to Back

When you initially draw multiple objects, the object that appears on top is always the last one drawn. However, you can change the order of objects in a stack with the Send to Back and Bring to Front buttons. The following figure illustrates this concept.



You can move multiple objects in a stack so that they keep their relative position to each other, as the following figure shows.



### Making Multiple Objects the Same Size

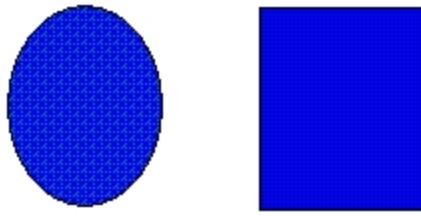
When you create multiple objects in a picture, you can easily resize one or more of the objects to match the size of another resized object. For example, let's say you add an oval to your picture. Next, you add a rectangle, and then you manually resize the rectangle. You can make the oval the same size as the rectangle by selecting both objects and using the Make Same Size function. By default, Make Same Size resizes the objects in the picture according to the most recently modified object's dimensions. If you want to resize objects using the dimensions of any other object, you must select that object and resize it first.

### Layering and Visibility

Layering objects is a powerful way to control specific objects in a complex picture or process. One of the most common uses for layering is when you are developing large displays, and you want your operators to be able to easily distinguish specific parts of the picture. By assigning a layer or multiple layers to objects in the picture, you determine which objects within the picture are visible to the operator. Further, layers are an effective security feature in that you can turn off a specific layer so that certain objects cannot be viewed by one or a set of operators.

You can establish layering using the Set Layer and Display Layers buttons on the Tools toolbar (Classic view) or from the Format tab in the Picture group, in the Layers list (Ribbon view). Setting a layer assigns a layer to a selected object. Displaying layers, on the other hand, applies to the entire picture, and determines what layers are displayed in your picture.

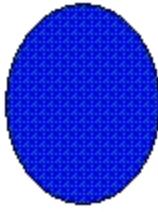
The following illustration shows two objects, Oval1 and Rect1, added to a picture.



Next, layers are assigned to the objects as follows:

1. The object Oval1 is set with a layer of 1.
2. The object Rect1 is set with a layer of 2.

Then, display layers are set to 1. The following figure shows what is displayed based on the layering that was assigned.



Next, the same objects are grouped, and layers are assigned to the objects as follows:

1. The object Oval1 is set with a layer of 1.
2. The object Rect1 is set with a layer of 2.
3. The grouped object Group1 is set with a layer of 1.

Then, display layers are set to 1. The grouped object is displayed, including one of its member objects (the oval).

Layers are controlled by the LayerName property, which can be animated using the Misc tab in the Advanced Animations dialog box, or by writing VBA scripts. In addition to the examples cited above, you can also effectuate the layering function in the run-time environment. After assigning layers to a set of objects, the objects appear at run-time according to the layering you have set.

What appears on your screen, whether you are in the configuration or run-time environments, is determined by the Visible property. However, this is only true if the layer assigned to that object is displayed. For example, if you assign the Visible property for an object to True, but that object does not appear in your picture, it is probably because the object is assigned to a layer that is not displayed (the LayerName property takes precedence over the Visible property).

#### Using the Visibility Expert

You can also set conditions for the Visible property using the Visibility Expert. This Expert lets you assign a data source to the property, or create an expression using conditional values and relational operators. To use the Visibility Expert, click the Visibility Expert button on the Experts toolbar (Classic view), or access the Visibility Expert from the Tools tab, in the Animations group (Ribbon View). If the

Toolbox is enabled, click the button on the Toolbox. For help on the Expert fields, click the Help button on the Expert.

### Setting the Layer Property Through VBA

When you set the Layer property through VBA, the layers are related to the property number by a bit mask. In the following equation,  $n$  is the layer number that you want to display:

```
picture.displaylayer = 2n-1
```

For example, if you want to display layer 3, picture.displaylayer would be equal to  $2^{3-1}$ , which is simplified to  $2^2$ , which is equal to 4. So, you would use the following VBA code:

```
picture.displaylayer = 4
```

If you want to display layer 4, picture.displaylayer would be equal to  $2^{4-1}$ , which is simplified to  $2^3$ , which is equal to 8. So, you would use the following VBA code:

```
picture.displaylayer = 8
```

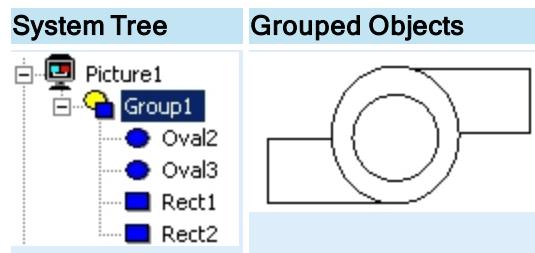
## Grouping and Ungrouping Objects

You can group objects together to create a new single object. This is called a *group*, or *grouped object*. A grouped object is like having a rubber band around your picture that contains all the objects you grouped together.

The power of grouped objects is that they let you create custom objects which you can reuse without building new ones from scratch. Like other objects, grouped objects have properties you can modify and control. You can manipulate a group as an object while maintaining individual object properties and animations. However, grouped objects do not need to be permanent. You can always destroy a grouped object by ungrouping it. When you ungroup it, the rubber band containing the objects in the group is deleted, but the member objects are not.

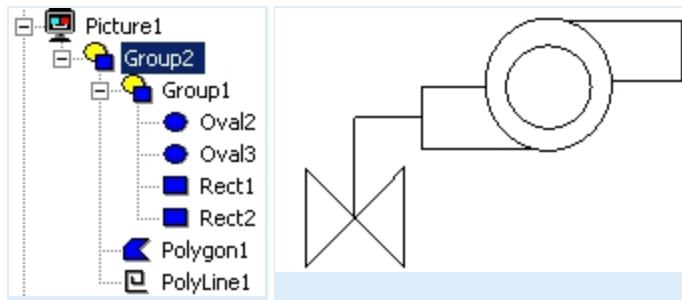
### Nesting Grouped Objects

You can nest a group inside another group. For example, you can create a pump from a group of rectangles and ovals and group them. When you group these objects, the iFIX WorkSpace adds a group name (Group 1) to the system tree for the group object and lists the individual objects that comprise the group one level down from the group name. The following figure illustrates this concept.



If you draw a valve (Polygon1), a connector (PolyLine1), and group it with the pump (Group1), another object named Group 2 is created which contains the first group (the pump) and the objects used to create the valve (the Polygon1 and PolyLine1), as the following figure shows.





### Editing Grouped Objects

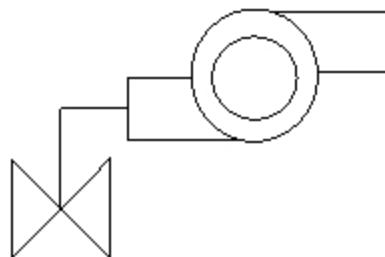
Once you create a grouped object, you can manipulate it like any other individual object, including moving, cutting, copying, and resizing it. Keep in mind, however, that when you ungroup an object, any changes you make to it affect the member objects. For example, if you resize a group before you ungroup it, you resize each individual object in the group.

Changing a group's animations, however, does not affect the member objects when you ungroup. To change the properties of individual objects, you must *drill down* into the group to select the object you want, without ungrouping the object.

#### Drilling Down into a Group

Drilling down allows you to meticulously control complex grouped objects. To drill down, select Enter DrillDown from the object pop-up menu and select the object in the group that you want to change. You can also hold down the shift key and click the object in the group that you want to change. Drilling down also lets you change the order in which the objects are stacked within the group.

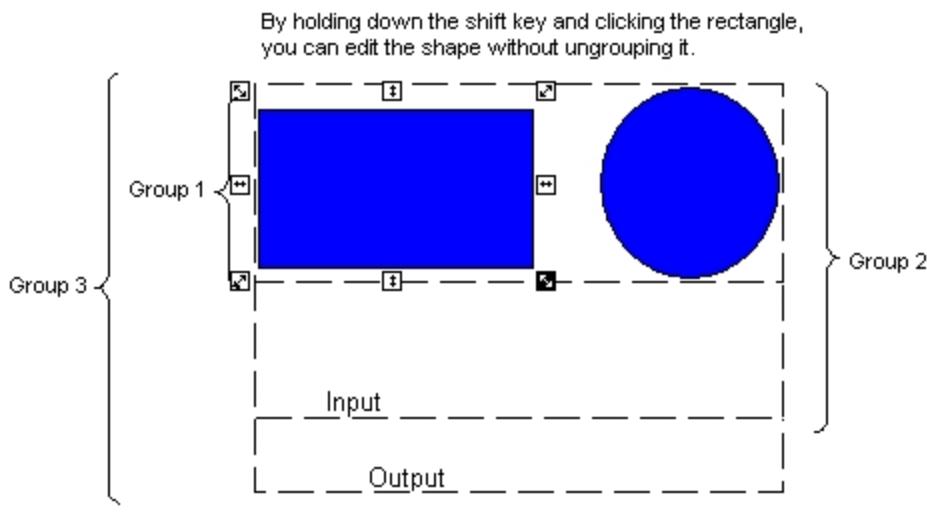
For example, suppose you want to change the color and size of the polygon (the valve) in the following figure.



One way to do this would be to ungroup, make changes to the polygon, and regroup the objects. However, this can be tedious and time-consuming, particularly if you have many objects in the group that you need to change. In addition, if the group contains animations or scripts, the animation settings and the scripts are destroyed when you ungroup the object.

A more effective way to modify the polygon is to drill down into the group and make changes without ungrouping. This approach saves time because you don't have to ungroup and then regroup, and consequently you preserve any animations or scripts you have assigned to the group.

When you drill down into a group to change an object, a box of dashed lines appear around the group. Any additional groups will also display a dashed line box. To change only a specific object in a group, first select the group that contains that object. Then right-click the group and select Enter DrillDown from the pop-up menu. Now you can select the object you want. You can also hold down the shift key and click the object in the group that you want to select, as the following figure illustrates.



*Nested Group Objects*

## Pictures Dialog Boxes

The WorkSpace application includes the following dialog boxes for working with pictures (listed in alphabetical order):

- [Add Alarm Extension Field1 Dialog Box](#)
- [Add Alarm Extension Field2 Dialog Box](#)
- [Add Area Dialog Box](#)
- [Add ColorSet Dialog Box](#)
- [Add Date In Dialog Box](#)
- [Add Date Last Dialog Box](#)
- [Add Description Dialog Box](#)
- [Add Node Dialog Box](#)
- [Add Priority Dialog Box](#)
- [Add Tag Dialog Box](#)
- [Add Time In Dialog Box](#)
- [Add Time Last Dialog Box](#)
- [Advanced Animations Dialog Box](#)
- [Advanced Lookup Options Dialog Box](#)
- [Alarm Summary Configuration Dialog Box](#)
- [Basic Animation Dialog Box](#)
- [Button Caption Converter Dialog Box](#)

- [Chart Configuration Dialog Box](#)
- [Color Selection Dialog Box](#)
- [Create Picture Wizard Dialog Box](#)
- [Custom Lookup Table Dialog Box](#)
- [Datalink Dialog Box](#)
- [Edit Picture Dialog Box](#)
- [Enhanced Chart Customization Dialog Box](#)
- [Grid Settings Dialog Box](#)
- [Historical Datalink Dialog Box](#)
- [Modify Area Dialog Box](#)
- [Modify Configuration Dialog Box](#)
- [Modify Pipe Characteristics Dialog Box](#)
- [New Level Dialog Box](#)
- [Select BackgroundColor](#)
- [Select Color Dialog Box](#)
- [Select EdgeColor](#)
- [Select FadeColor Dialog Box](#)
- [Select ForegroundColor](#)
- [Upgrading Pictures to Screen Independent Enhanced Coordinates Dialog Box](#)

## Add Ack Dialog Box

The Add Ack dialog box displays the following items:

### **Acknowledged**

Lists the alarms that have been acknowledged.

### **Unacknowledged**

Lists the alarms that have not been acknowledged.

## Add Alarm Extension Field1 Dialog Box

The Add Alarm Extension Field1 dialog box displays the following items:

### **Containing**

Allows you to configure the Alarm Summary object to display only those alarms that contain the text string entered in the Description field.

### **Not Containing**

Allows you to configure the Alarm Summary object to display all alarms that do not contain the text string entered in the Description field.

### **Containing Only**

Allows you to configure the Alarm Summary object to display all alarms that contain an exact match of the text string entered in the Description field.

### **Alarm Extension Field1**

Allows you to enter the text description for which to filter alarms. You can use the asterisk (\*) wildcard character to match substrings; for example, my\* would filter the description "mynode". You can also use the question mark (?) wildcard character to match individual characters; for example, myno?e would also filter the description "mynode".

## **Add Alarm Extension Field2 Dialog Box**

The Add Alarm Extension Field2 dialog box displays the following items:

### **Containing**

Allows you to configure the Alarm Summary object to display only those alarms that contain the text string entered in the Description field.

### **Not Containing**

Allows you to configure the Alarm Summary object to display all alarms that do not contain the text string entered in the Description field.

### **Containing Only**

Allows you to configure the Alarm Summary object to display all alarms that contain an exact match of the text string entered in the Description field.

### **Alarm Extension Field2**

Allows you to enter the text description for which to filter alarms. You can use the asterisk (\*) wildcard character to match substrings; for example, my\* would filter the description "mynode". You can also use the question mark (?) wildcard character to match individual characters; for example, myno?e would also filter the description "mynode".

## **Add Area Dialog Box**

The Add Area dialog box displays the following items:

### **Available**

Lists the alarm areas that are currently available. To filter alarms by alarm area, select the area(s) from this list and select the In or Not In option button.

## In

Allows you to filter alarms by the alarm areas that are currently selected in the Available list. When this option is selected, the Alarm Summary object displays only those alarms from the selected alarm areas.

## Not In

Allows you to filter alarms by the alarm areas that are currently selected in the Available list. When this option is selected, the Alarm Summary object ignores all alarms from the selected alarm areas.

## Add Area Not Currently in List Edit Box

Allows you to add an alarm area name to the Available list, if it does not appear by default. Enter the alarm area name in this field and click Add to add it to the list.

## Add Button

Allows you to add an alarm area name to the Available list, if it does not appear by default. Enter the alarm area name in the Add Area Not Currently In List field and click this button to add it to the Available list.

## Add ColorSet Dialog Box

The Add ColorSet dialog box displays the following item:

### Name

Allows you to enter a name for your color set.

## Add Date In Dialog Box

The Add Date In dialog box displays the following items:

### Operator

Item	Description
=	Allows you to configure the Alarm Summary object to display only those alarms that are equal to the value of the field to the right. For example, if the equal operator is used in conjunction with the Time In field, and the value in the Time In field is 10:00:00, then the Alarm Summary object will display only those alarms that first occurred at 10:00:00.
< >	Allows you to configure the Alarm Summary object to display only those alarms that are not equal to the value of the field to the right. For example, if the not equal operator is used in conjunction with the Time In field, and the value in the Time In field is 10:00:00, then the Alarm Summary object will display all alarms that did not first occur at 10:00:00.
>	Allows you to configure the Alarm Summary object to display only those alarms that are greater than the value of the field to the right. For example, if the greater than operator is used in conjunction with the Time In field, and the value in the Time In field is

	10:00:00, then the Alarm Summary object will display only those alarms that first occurred after 10:00:00.
>=	Allows you to configure the Alarm Summary object to display only those alarms that are greater than or equal to the value of the field to the right. For example, if the greater than or equal to operator is used in conjunction with the Time In field, and the value in the Time In field is 10:00:00, then the Alarm Summary object will display all alarms that first occurred at or after 10:00:00.
<	Allows you to configure the Alarm Summary object to display only those alarms that are less than the value of the field to the right. For example, if the less than operator is used in conjunction with the Time In field, and the value in the Time In field is 10:00:00, then the Alarm Summary object will display only those alarms that first occurred before 10:00:00.
<=	Allows you to configure the Alarm Summary object to display only those alarms that are less than or equal to the value of the field to the right. For example, if the less than or equal to operator is used in conjunction with the Time In field, and the value in the Time In field is 10:00:00, then the Alarm Summary object will display all alarms that first occurred at or before 10:00:00.

#### Date In

The date when the block first generated the alarm - used as a condition to filter alarms.

#### Add Date Last Dialog Box

The Add Date Last dialog box displays the following items:

##### Operator

Item	Description
=	Allows you to configure the Alarm Summary object to display only those alarms that are equal to the value of the field to the right. For example, if the equal operator is used in conjunction with the Time In field, and the value in the Time In field is 10:00:00, then the Alarm Summary object will display only those alarms that first occurred at 10:00:00.
< >	Allows you to configure the Alarm Summary object to display only those alarms that are not equal to the value of the field to the right. For example, if the not equal operator is used in conjunction with the Time In field, and the value in the Time In field is 10:00:00, then the Alarm Summary object will display all alarms that did not first occur at 10:00:00.
>	Allows you to configure the Alarm Summary object to display only those alarms that are greater than the value of the field to the right. For example, if the greater than operator is used in conjunction with the Time In field, and the value in the Time In field is

	10:00:00, then the Alarm Summary object will display only those alarms that first occurred after 10:00:00.
>=	Allows you to configure the Alarm Summary object to display only those alarms that are greater than or equal to the value of the field to the right. For example, if the greater than or equal to operator is used in conjunction with the Time In field, and the value in the Time In field is 10:00:00, then the Alarm Summary object will display all alarms that first occurred at or after 10:00:00.
<	Allows you to configure the Alarm Summary object to display only those alarms that are less than the value of the field to the right. For example, if the less than operator is used in conjunction with the Time In field, and the value in the Time In field is 10:00:00, then the Alarm Summary object will display only those alarms that first occurred before 10:00:00.
<=	Allows you to configure the Alarm Summary object to display only those alarms that are less than or equal to the value of the field to the right. For example, if the less than or equal to operator is used in conjunction with the Time In field, and the value in the Time In field is 10:00:00, then the Alarm Summary object will display all alarms that first occurred at or before 10:00:00.

### Date Last

The date when the block last generated the alarm - used as a condition to filter alarms.

## Add Description Dialog Box

The Add Description dialog box displays the following items:

### Containing

Allows you to configure the Alarm Summary object to display only those alarms that contain the text string entered in the Description field.

### Not Containing

Allows you to configure the Alarm Summary object to display all alarms that do not contain the text string entered in the Description field.

### Containing Only

Allows you to configure the Alarm Summary object to display all alarms that contain an exact match of the text string entered in the Description field.

### Description

Allows you to enter the text description for which to filter alarms. You can use the asterisk (\*) wildcard character to match substrings; for example, my\* would filter the description "mynode". You can also use the question mark (?) wildcard character to match individual characters; for example, myno?e would also filter the description "mynode".

## Add Node Dialog Box

The Add Node dialog box displays the following items:

#### Available

Lists the nodes that are currently available. To filter alarms by node, select the node from this list and select the In or Not In option button.

#### In

Allows you to filter alarms by the nodes that are currently selected in the Available list. When this option is selected, the Alarm Summary object displays only the available nodes.

#### Not In

Allows you to filter alarms by the nodes that are currently selected in the Available list. When this option is selected, the Alarm Summary object ignores all alarms from the selected alarm areas.

## Add Priority Dialog Box

The Add Priority dialog box displays the following items:

#### Operator

Item	Description
=	Allows you to configure the Alarm Summary object to display only those alarms that are equal to the priority listed on the right.
< >	Allows you to configure the Alarm Summary object to display only those alarms that are not equal to the priority listed on the right.
> =	Allows you to configure the Alarm Summary object to display only those alarms that are greater than or equal to the priority listed on the right.
< =	Allows you to configure the Alarm Summary object to display only those alarms that are less than or equal to the priority listed on the right.

#### Priority Drop-Down List

Allows you to select an **INFO**, **LOLO**, **LOW**, **MEDIUM**, **HIGH**, **HIHI**, or **CRITICAL** priority condition to filter the alarms.

## Add Tag Dialog Box

The Add Tag dialog box displays the following items:

#### Operator

Item	Description
=	Allows you to configure the Alarm Summary object to display only those alarms that are generated from the tagname entered in the Tagname field.

< >	Allows you to configure the Alarm Summary object to display all alarms that are not generated from the tagname entered in the Tagname field.
-----	--

### Tagname

Allows you to enter a tagname for which you want to filter alarms.

## Add Time In Dialog Box

The Add Time In dialog box displays the following items:

### Operator

Item	Description
=	Allows you to configure the Alarm Summary object to display only those alarms that are equal to the value of the field to the right. For example, if the equal operator is used in conjunction with the Time In field, and the value in the Time In field is 10:00:00, then the Alarm Summary object will display only those alarms that first occurred at 10:00:00.
< >	Allows you to configure the Alarm Summary object to display only those alarms that are not equal to the value of the field to the right. For example, if the not equal operator is used in conjunction with the Time In field, and the value in the Time In field is 10:00:00, then the Alarm Summary object will display all alarms that did not first occur at 10:00:00.
>	Allows you to configure the Alarm Summary object to display only those alarms that are greater than the value of the field to the right. For example, if the greater than operator is used in conjunction with the Time In field, and the value in the Time In field is 10:00:00, then the Alarm Summary object will display only those alarms that first occurred after 10:00:00.
>=	Allows you to configure the Alarm Summary object to display only those alarms that are greater than or equal to the value of the field to the right. For example, if the greater than or equal to operator is used in conjunction with the Time In field, and the value in the Time In field is 10:00:00, then the Alarm Summary object will display all alarms that first occurred at or after 10:00:00.
<	Allows you to configure the Alarm Summary object to display only those alarms that are less than the value of the field to the right. For example, if the less than operator is used in conjunction with the Time In field, and the value in the Time In field is 10:00:00, then the Alarm Summary object will display only those alarms that first occurred before 10:00:00.
<=	Allows you to configure the Alarm Summary object to display only those alarms that are less than or equal to the value of the field to the right. For example, if the less than or equal to operator

is used in conjunction with the Time In field, and the value in the Time In field is 10:00:00, then the Alarm Summary object will display all alarms that first occurred at or before 10:00:00.

### Time In

The time that the block first generated the alarm - used as a condition to filter alarms.

### Add Time Last Dialog Box

The Add Time Last dialog box displays the following items:

#### Operator

Item	Description
=	Allows you to configure the Alarm Summary object to display only those alarms that are equal to the value of the field to the right. For example, if the equal operator is used in conjunction with the Time In field, and the value in the Time In field is 10:00:00, then the Alarm Summary object will display only those alarms that first occurred at 10:00:00.
< >	Allows you to configure the Alarm Summary object to display only those alarms that are not equal to the value of the field to the right. For example, if the not equal operator is used in conjunction with the Time In field, and the value in the Time In field is 10:00:00, then the Alarm Summary object will display all alarms that did not first occur at 10:00:00.
>	Allows you to configure the Alarm Summary object to display only those alarms that are greater than the value of the field to the right. For example, if the greater than operator is used in conjunction with the Time In field, and the value in the Time In field is 10:00:00, then the Alarm Summary object will display only those alarms that first occurred after 10:00:00.
>=	Allows you to configure the Alarm Summary object to display only those alarms that are greater than or equal to the value of the field to the right. For example, if the greater than or equal to operator is used in conjunction with the Time In field, and the value in the Time In field is 10:00:00, then the Alarm Summary object will display all alarms that first occurred at or after 10:00:00.
<	Allows you to configure the Alarm Summary object to display only those alarms that are less than the value of the field to the right. For example, if the less than operator is used in conjunction with the Time In field, and the value in the Time In field is 10:00:00, then the Alarm Summary object will display only those alarms that first occurred before 10:00:00.
<=	Allows you to configure the Alarm Summary object to display only those alarms that are less than or equal to the value of the field to the right. For example, if the less than or equal to operator

is used in conjunction with the Time In field, and the value in the Time In field is 10:00:00, then the Alarm Summary object will display all alarms that first occurred at or before 10:00:00.

### Time Last

The time when the alarm condition or status last changed - used as a condition to filter alarms.

## Advanced Animations Dialog Box

The Advanced Animation dialog box can display the following tabs:

- [General Tab](#)
- [Visibility Tab](#)
- [Size Tab](#)
- [Miscellaneous Tab](#)
- [Position Tab](#)
- [Color Tab](#)
- [Style Tab](#)
- [Rotate Tab](#)
- [Fill Tab](#)
- [Gradient Tab](#)
- [Text Tab](#)
- [Behavior Tab](#)
- [Appearance Tab](#)
- [Picture Tab](#)

### General Tab - Advanced Animations Dialog Box

The General tab of the Advanced Animations dialog box displays the following items:

#### Name

Allows you to enter a name for the selected object. The name that you specify appears in the WorkSpace system tree and in the Name row of the VBA Property window.

#### Description

Allows you to enter a description for the selected object. The description that you specify appears in the ToolTip for the object (provided that the Enable ToolTips option is enabled) and in the Description row of the VBA Property window.

#### **Help Context ID**

Allows you to enter a help context ID for the selected object if you are creating your own context-sensitive, picture-specific help files. See the Mastering iFIX manual for more information.

#### **Enable Tooltips**

Select this check box to display an on-screen description of the object when the pointer pauses on it.

#### **Tooltip Option**

This drop-down list is only available when the Enable Tooltip option is selected. Select the item from the list that specifies where the tooltip text comes from:

- The object's Description property (TooltipDescription).
- The Dynamo's Description property (TooltipDynamoDescription).
- From a run mode tag value description supplied when you load tag status symbols for your picture (TooltipTagStatus).

#### **Enable Highlight**

Select this check box to display a highlight around the object when the pointer is over it.

#### **Enable Select**

Select this check box to allow operators to select the object at run-time.

### **Visibility Tab - Advanced Animations Dialog Box**

The Visibility tab of the Advanced Animations dialog box displays the following items:

#### **Properties**

Provides options that allow you to select the properties that you want to animate. For a brief description of each property, read the property description on the right side of the dialog box.

#### **Animate**

Select this check box to open dynamic settings for the visible property. When selected, the Dynamic Setting for the Visible Property area appears directly below the Properties area.

#### **Dynamic Settings for Property**

#### **Data Source**

Allows you to enter a data source or expression for this object.

*Data source* refers to a reference to a source of information, such as iFIX tagnames and historical files, or other OPC-compliant data servers. A data source may also consist of iFIX objects (such as shapes, charts, and variables) or 3rd party OLE controls.

*Expression* refers to constants, data sources, or a combination of constants and data sources that are connected with one or more operators. Use the Browse (...) button to open the Expression Builder dialog box. Use the Quick Modify button to modify a database block directly without launching the Database Manager.

#### **Animation Properties Tab**

The Animation Properties tab contains the following items:

Item	Description
Data Conversion	<p>Allows you to select the type of data conversion to apply to the data from the source listed in the Data Source field. A data conversion defines how the incoming data should be processed or formatted so that your objects behave according to the properties you have assigned to them. You can apply any of the following data conversion:</p> <ul style="list-style-type: none"> <li>• <b>Range</b> - uses a range of values on which to animate an object.</li> <li>• <b>Table</b> - attempts to match the incoming value from the data source to an entry in a lookup table. If a match occurs, the selected property is changed to match the output value.</li> <li>• <b>Format</b> - provides several options for formatting text data.</li> <li>• <b>Object</b> - processes the data received from the data source at its exact value. This option is not supported for data from GE Historian.</li> </ul> <p><b>NOTE:</b> If you change the Data Conversion option from Table to Range, Format, or Object, the bottom half the dialog box changes accordingly.</p>
Output Error Mode	<p>Allows you to configure how an animation behaves if an error occurs. Depending on the type of data conversion, the output error mode can be any of the following:</p> <ul style="list-style-type: none"> <li>• <b>Use Current Output</b> - Displays the data exactly as it appeared in when the error occurred.</li> <li>• <b>Use Error Table</b> - Displays an error message that matches the current error, based on the error definitions in the Animations Data Error Defaults tab of the User Preferences dialog box.</li> <li>• <b>Use Minimum Value</b> - Displays the lowest possible value that is valid for the data source when an error occurs.</li> <li>• <b>Use Maximum Value</b> - Displays the highest possible value that is valid for the data source when an error occurs.</li> </ul>
Exact Match	<p>Allows you to specify that incoming data must exactly match the configured input value in the lookup table in order to format the data as the corresponding output value.</p>
Range Comparison	<p>Allows you to specify that incoming data must fall within a range of input values in the lookup table in order to format the data as the corresponding output value.</p>
Insert Row	<p>Inserts a new row into the data conversion table.</p>
Modify Row	<p>Displays the <a href="#">New Level Dialog Box</a> so that you can modify an</p>

	existing row in the data conversion table.
Delete Row	Deletes an existing row of the data conversion table.
Advanced	Displays the <a href="#">Advanced Lookup Options Dialog Box</a> that allows you to configure several more lookup options.

#### Historical Properties Tab

The Historical Properties tab allows you to set the parameters for a query that fetches historical data from GE Historian. The tab contains the following items:

**NOTE:** The following fields, with the exception of the Update Rate fields, are only available if you select a Historical Mode other than Current Value.

##### Start Date

Item	Description
Fixed Date	Specifies whether to enter a specific start date for the query of the data source.
Days Before Now	Specifies whether to enter the number of days prior to today to fetch data from GE Historian. For example, if you want to display data collected for the data source two days ago, enter 2.

##### Start Time

Item	Description
Fixed Time	Specifies whether to designate a specific time to start. If selected, allows you to enter an explicit start time.
Lock Time	Locks the Fixed Time, even if you change the time zone in the Date and Time Properties dialog box in the Control Panel. This field is available only when you designate a specific time to start using the Fixed Time field.
Duration Before Now	Specifies whether to enter the duration prior to the current time to start. The minimum duration is 0 seconds; the maximum is 23 hours, 59 minutes, and 59 seconds.

##### Time Zone

Item	Description
Time Zone	Allows you to select the time zone to associate with the start time. You can select the client time (time zone for your computer), the server time (time zone used by the Historian server), or the tag time (uses the time zone bias of the tag, which is set in Historian). The default time zone is that of the client machine. This field is available only when Historian is used.
Adjust for Daylight Savings Time	Adjusts the time if the zone you selected is experiencing daylight saving. This field works only if you selected the Automatically adjust clock for daylight saving changes check box located on the Time Zone tab of the Date/Time Properties dialog box in the Control Panel.

#### **Historical Mode**

Allows you to determine how iFIX selects and fetches data from a historical data source and, determines what each displayed value represents. The options are:

- Sample - The last valid value found, up to and including the start of the specified interval.
- Avg - The average of all valid data found during the specified interval.
- High - The highest valid data point value found during the specified interval.
- Low - The lowest valid data point value found during the specified interval.
- Interpolated - The data is interpreted by assuming that the line between two values is a straight line. All points along that line are estimated except the starting point and the ending point.
- Current Value - The current value of the data point.

**IMPORTANT:** The Current Value may update at a rate different from the rate set in the Update Rate field. The update rate is not set solely by the rate entered in the Update Rate field. It also depends on the collection rate, the rate for querying Historian, and the time required to request an update from the Historian server and send it back to the client. As a result, the time it takes to display the updates may be longer than anticipated. Additionally, please be aware that the timestamp for this mode represents the timestamp from the Historian server, not the client.

- Standard Deviation - The standard deviation of all valid data found during the specified interval.
- Total - The total of all valid data found during the specified interval.

#### **Duration**

The duration determines the time range for the historical data source. The minimum duration for a fetch is one second; the maximum is 999 days, 23 hours, 59 minutes, and 59 seconds.

Item	Description
Days	Allows you to enter the number of days. This field can be used in conjunction with the other fields in this area.
Hours	Allows you to enter the number of hours for the duration for the data fetch query. This field can be used in conjunction with the other fields in this area.
Mins	Allows you to enter the number of minutes for the duration for the data fetch query. This field can be used in conjunction with the other fields in this area.
Secs	Allows you to enter the number of seconds for the duration for the data fetch query. This field can be used in conjunction with the other fields in this area.

#### **Update Rate**

Allows you to specify the rate at which the data is updated. The default rate is five seconds. Zero is permitted for a one-time fetch. The fastest update rate is five seconds, the slowest, 1:59:59.

Item	Description
Hours	Allows you to enter the number of hours for the rate of data update. This field can be used in conjunction with the other fields in this area.

Mins	Allows you to enter the number of minutes for the rate of data update. This field can be used in conjunction with the other fields in this area.
Secs	Allows you to enter the number of seconds for the rate of data update. This field can be used in conjunction with the other fields in this area.

## Size Tab - Advanced Animations Dialog Box

The Size tab of the Advanced Animations dialog box displays the following items:

### Properties

Provides options that allow you to select the properties that you want to animate. For a brief description of each property, read the property description on the right side of the dialog box.

### Animate

Select this check box to open dynamic settings for the visible property. When selected, the Dynamic Setting for Property area appears directly below the Properties area.

### Dynamic Settings for Property

#### Data Source

Allows you to enter a data source or expression for this object.

*Data source* refers to a reference to a source of information, such as iFIX tagnames and historical files, or other OPC-compliant data servers. A data source may also consist of iFIX objects (such as shapes, charts, and variables) or 3rd party OLE controls.

*Expression* refers to constants, data sources, or a combination of constants and data sources that are connected with one or more operators. Use the Browse (...) button to open the Expression Builder dialog box. Use the Quick Modify button to modify a database block directly without launching the Database Manager.

#### Animation Properties

The Animation Properties tab contains the following items:

Item	Description
Data Conversion	<p>Allows you to select the type of data conversion to apply to the data from the source listed in the Data Source field. A data conversion defines how the incoming data should be processed or formatted so that your objects behave according to the properties you have assigned to them. You can apply any of the following data conversion:</p> <ul style="list-style-type: none"> <li>• <b>Range</b> - uses a range of values on which to animate an object.</li> <li>• <b>Table</b> - attempts to match the incoming value from the data source to an entry in a lookup table. If a match occurs, the selected property is changed to match the output value.</li> </ul>

	<ul style="list-style-type: none"> <li><b>Format</b> - provides several options for formatting text data.</li> <li><b>Object</b> - processes the data received from the data source at its exact value. This option is not supported for data from GE Historian.</li> </ul> <p><b>NOTE:</b> If you change the Data Conversion option from Range to Table, Format, or Object, the bottom half the dialog box changes accordingly.</p>
Output Error Mode	<p>Allows you to configure how an animation behaves if an error occurs. Depending on the type of data conversion, the output error mode can be any of the following:</p> <ul style="list-style-type: none"> <li><b>Use Current Output</b>- Displays the data exactly as it appeared in when the error occurred.</li> <li><b>Use Error Table</b>- Displays an error message that matches the current error, based on the error definitions in the Animations Data Error Defaults tab of the User Preferences dialog box.</li> <li><b>Use Minimum Value</b>- Displays the lowest possible value that is valid for the data source when an error occurs.</li> <li><b>Use Maximum Value</b>- Displays the highest possible value that is valid for the data source when an error occurs.</li> </ul>
Minimum Input	Allows you to specify the low limit value for incoming data.
Minimum Output	Allows you to apply linear signal conditioning to the data by mapping the range of input values specified in the Minimum and Maximum Input fields to a range of output values. Enter the minimum value, in logical units or postscript points, for the output range in this field.
Maximum Input	Allows you to specify the high limit value for incoming data.
Maximum Output	Allows you to apply linear signal conditioning to the data by mapping the range of input values specified in the Minimum and Maximum Input fields to a range of output values. Enter the maximum value, in logical units or postscript points, for the output range in this field.
Fetch Input Range on Open	Select this check box to automatically fetch the minimum and maximum input values for the data source at run-time.

**NOTE:** Fetching data limits at runtime for an expression with more than one data source is not supported and may produce unexpected results at runtime. This is because there could be different tag names in the expression and it may not be clear which tag to fetch the limits for.

#### Historical Properties Tab

The Historical Properties tab allows you to set the parameters for a query that fetches historical data from GE Historian. The tab contains the following items:

**NOTE:** The following fields, with the exception of the Update Rate fields, are only available if you select a Historical Mode other than Current Value.

#### Start Date

Item	Description
Fixed Date	Specifies whether to enter a specific start date for the query of the data source.
Days Before Now	Specifies whether to enter the number of days prior to today to fetch data from GE Historian. For example, if you want to display data collected for the data source two days ago, enter 2.

#### Start Time

Item	Description
Fixed Time	Specifies whether to designate a specific time to start. If selected, allows you to enter an explicit start time.
Lock Time	Locks the Fixed Time, even if you change the time zone in the Date and Time Properties dialog box in the Control Panel. This field is available only when you designate a specific time to start using the Fixed Time field.
Duration Before Now	Specifies whether to enter the duration prior to the current time to start. The minimum duration is 0 seconds; the maximum is 23 hours, 59 minutes, and 59 seconds.

#### Time Zone

Item	Description
Time Zone	Allows you to select the time zone to associate with the start time. You can select the client time (time zone for your computer), the server time (time zone used by the Historian server), or the tag time (uses the time zone bias of the tag, which is set in Historian). The default time zone is that of the client machine. This field is available only when Historian is used.
Adjust for Daylight Savings Time	Adjusts the time if the zone you selected is experiencing daylight saving. This field works only if you selected the Automatically adjust clock for daylight saving changes check box located on the Time Zone tab of the Date/Time Properties dialog box in the Control Panel.

#### Historical Mode

Allows you to determine how iFIX selects and fetches data from a historical data source and, determines what each displayed value represents. The options are:

- Sample - The last valid value found, up to and including the start of the specified interval.
- Avg - The average of all valid data found during the specified interval.
- High - The highest valid data point value found during the specified interval.
- Low - The lowest valid data point value found during the specified interval.

- Interpolated - The data is interpreted by assuming that the line between two values is a straight line. All points along that line are estimated except the starting point and the ending point.
- Current Value - The current value of the data point.

**IMPORTANT:** The Current Value may update at a rate different from the rate set in the Update Rate field. The update rate is not set solely by the rate entered in the Update Rate field. It also depends on the collection rate, the rate for querying Historian, and the time required to request an update from the Historian server and send it back to the client. As a result, the time it takes to display the updates may be longer than anticipated. Additionally, please be aware that the timestamp for this mode represents the timestamp from the Historian server, not the client.

- Standard Deviation - The standard deviation of all valid data found during the specified interval.
- Total - The total of all valid data found during the specified interval.

#### Duration

The duration determines the time range for the historical data source. The minimum duration for a fetch is one second; the maximum is 999 days, 23 hours, 59 minutes, and 59 seconds.

Item	Description
Days	Allows you to enter the number of days. This field can be used in conjunction with the other fields in this area.
Hours	Allows you to enter the number of hours for the duration for the data fetch query. This field can be used in conjunction with the other fields in this area.
Mins	Allows you to enter the number of minutes for the duration for the data fetch query. This field can be used in conjunction with the other fields in this area.
Secs	Allows you to enter the number of seconds for the duration for the data fetch query. This field can be used in conjunction with the other fields in this area.

#### Update Rate

Allows you to specify the rate at which the data is updated. The default rate is five seconds. Zero is permitted for a one-time fetch. The fastest update rate is five seconds, the slowest, 1:59:59.

Item	Description
Hours	Allows you to enter the number of hours for the rate of data update. This field can be used in conjunction with the other fields in this area.
Mins	Allows you to enter the number of minutes for the rate of data update. This field can be used in conjunction with the other fields in this area.
Secs	Allows you to enter the number of seconds for the rate of data update. This field can be used in conjunction with the other fields in this area.

#### Miscellaneous Tab - Advanced Animations Dialog Box

The Miscellaneous tab of the Advanced Animations dialog box displays the following items:

## Properties

Provides options that allow you to select the properties that you want to animate. For a brief description of each property, read the property description on the right side of the dialog box.

### Animate

Select this check box to open dynamic settings for the visible property. When selected, the Dynamic Setting for Property area appears directly below the Properties area.

### Dynamic Settings for Property

#### Data Source

Allows you to enter a data source or expression for this object.

*Data source* refers to a reference to a source of information, such as iFIX tagnames and historical files, or other OPC-compliant data servers. A data source may also consist of iFIX objects (such as shapes, charts, and variables) or 3rd party OLE controls.

*Expression* refers to constants, data sources, or a combination of constants and data sources that are connected with one or more operators. Use the Browse (...) button to open the Expression Builder dialog box. Use the Quick Modify button to modify a database block directly without launching the Database Manager.

#### Animation Properties

The Animation Properties tab contains the following items:

Item	Description
Data Conversion	<p>Allows you to select the type of data conversion to apply to the data from the source listed in the Data Source field. A data conversion defines how the incoming data should be processed or formatted so that your objects behave according to the properties you have assigned to them. You can apply any of the following data conversion:</p> <ul style="list-style-type: none"><li>• <b>Range</b> - uses a range of values on which to animate an object.</li><li>• <b>Table</b> - attempts to match the incoming value from the data source to an entry in a lookup table. If a match occurs, the selected property is changed to match the output value.</li><li>• <b>Format</b> - provides several options for formatting text data.</li><li>• <b>Object</b> - processes the data received from the data source at its exact value. This option is not supported for data from GE Historian.</li></ul> <p><b>NOTE:</b> If you change the Data Conversion option from Table to Range, Format, or Object, the bottom half the dialog box changes accordingly.</p>
Output Error Mode	Allows you to configure how an animation behaves if an error

	<p>occurs. Depending on the type of data conversion, the output error mode can be any of the following:</p> <ul style="list-style-type: none"> <li>• <b>Use Current Output</b> - Displays the data exactly as it appeared in when the error occurred.</li> <li>• <b>Use Error Table</b> - Displays an error message that matches the current error, based on the error definitions in the Animations Data Error Defaults tab of the User Preferences dialog box.</li> <li>• <b>Use Minimum Value</b> - Displays the lowest possible value that is valid for the data source when an error occurs.</li> <li>• <b>Use Maximum Value</b> - Displays the highest possible value that is valid for the data source when an error occurs.</li> </ul>
Exact Match	Allows you to specify that incoming data must exactly match the configured input value in the lookup table in order to format the data as the corresponding output value.
Range Comparison	Allows you to specify that incoming data must fall within a range of input values in the lookup table in order to format the data as the corresponding output value.
Insert Row	Inserts a new row into the data conversion table.
Modify Row	Displays the <a href="#">New Level Dialog Box</a> so that you can modify an existing row in the data conversion table.
Delete Row	Deletes an existing row of the data conversion table.
Advanced	Displays the <a href="#">Advanced Lookup Options Dialog Box</a> that allows you to configure several more lookup options.

#### Historical Properties Tab

The Historical Properties tab allows you to set the parameters for a query that fetches historical data from GE Historian. The tab contains the following items:

**NOTE:** The following fields, with the exception of the Update Rate fields, are only available if you select a Historical Mode other than Current Value.

##### Start Date

Item	Description
Fixed Date	Specifies whether to enter a specific start date for the query of the data source.
Days Before Now	Specifies whether to enter the number of days prior to today to fetch data from GE Historian. For example, if you want to display data collected for the data source two days ago, enter 2.

##### Start Time

Item	Description
Fixed Time	Specifies whether to designate a specific time to start. If selected,

	allows you to enter an explicit start time.
Lock Time	Locks the Fixed Time, even if you change the time zone in the Date and Time Properties dialog box in the Control Panel. This field is available only when you designate a specific time to start using the Fixed Time field.
Duration Before Now	Specifies whether to enter the duration prior to the current time to start. The minimum duration is 0 seconds; the maximum is 23 hours, 59 minutes, and 59 seconds.

#### Time Zone

Item	Description
Time Zone	Allows you to select the time zone to associate with the start time. You can select the client time (time zone for your computer), the server time (time zone used by the Historian server), or the tag time (uses the time zone bias of the tag, which is set in Historian). The default time zone is that of the client machine. This field is available only when Historian is used.
Adjust for Daylight Savings Time	Adjusts the time if the zone you selected is experiencing daylight saving. This field works only if you selected the Automatically adjust clock for daylight saving changes check box located on the Time Zone tab of the Date/Time Properties dialog box in the Control Panel.

#### Historical Mode

Allows you to determine how iFIX selects and fetches data from a historical data source and, determines what each displayed value represents. The options are:

- Sample - The last valid value found, up to and including the start of the specified interval.
- Avg - The average of all valid data found during the specified interval.
- High - The highest valid data point value found during the specified interval.
- Low - The lowest valid data point value found during the specified interval.
- Interpolated - The data is interpreted by assuming that the line between two values is a straight line. All points along that line are estimated except the starting point and the ending point.
- Current Value - The current value of the data point.

**IMPORTANT:** The Current Value may update at a rate different from the rate set in the Update Rate field. The update rate is not set solely by the rate entered in the Update Rate field. It also depends on the collection rate, the rate for querying Historian, and the time required to request an update from the Historian server and send it back to the client. As a result, the time it takes to display the updates may be longer than anticipated. Additionally, please be aware that the timestamp for this mode represents the timestamp from the Historian server, not the client.

- Standard Deviation - The standard deviation of all valid data found during the specified interval.
- Total - The total of all valid data found during the specified interval.

#### Duration

The duration determines the time range for the historical data source. The minimum duration for a fetch is one second; the maximum is 999 days, 23 hours, 59 minutes, and 59 seconds.

Item	Description
Days	Allows you to enter the number of days. This field can be used in conjunction with the other fields in this area.
Hours	Allows you to enter the number of hours for the duration for the data fetch query. This field can be used in conjunction with the other fields in this area.
Mins	Allows you to enter the number of minutes for the duration for the data fetch query. This field can be used in conjunction with the other fields in this area.
Secs	Allows you to enter the number of seconds for the duration for the data fetch query. This field can be used in conjunction with the other fields in this area.

#### Update Rate

Allows you to specify the rate at which the data is updated. The default rate is five seconds. Zero is permitted for a one-time fetch. The fastest update rate is five seconds, the slowest, 1:59:59.

Item	Description
Hours	Allows you to enter the number of hours for the rate of data update. This field can be used in conjunction with the other fields in this area.
Mins	Allows you to enter the number of minutes for the rate of data update. This field can be used in conjunction with the other fields in this area.
Secs	Allows you to enter the number of seconds for the rate of data update. This field can be used in conjunction with the other fields in this area.

#### Position Tab - Advanced Animations Dialog Box

The Position tab of the Advanced Animations dialog box displays the following items:

##### Properties

Provides options that allow you to select the properties that you want to animate. For a brief description of each property, read the property description on the right side of the dialog box.

##### Animate

Select this check box to open dynamic settings for the visible property. When selected, the Dynamic Setting for Property area appears directly below the Properties area.

##### Dynamic Settings for Property

##### Data Source

Allows you to enter a data source or expression for this object.

*Data source* refers to a reference to a source of information, such as iFIX tagnames and historical files, or other OPC-compliant data servers. A data source may also consist of iFIX objects (such as shapes, charts, and variables) or 3rd party OLE controls.

*Expression* refers to constants, data sources, or a combination of constants and data sources that are connected with one or more operators. Use the Browse (...) button to open the Expression Builder dialog box. Use the Quick Modify button to modify a database block directly without launching the Database Manager.

#### The Animation Properties Tab

The Animation Properties tab contains the following items:

Item	Description
Data Conversion	<p>Allows you to select the type of data conversion to apply to the data from the source listed in the Data Source field. A data conversion defines how the incoming data should be processed or formatted so that your objects behave according to the properties you have assigned to them. You can apply any of the following data conversion:</p> <ul style="list-style-type: none"> <li>• <b>Range</b> - uses a range of values on which to animate an object.</li> <li>• <b>Table</b> - attempts to match the incoming value from the data source to an entry in a lookup table. If a match occurs, the selected property is changed to match the output value.</li> <li>• <b>Format</b> - provides several options for formatting text data.</li> <li>• <b>Object</b> - processes the data received from the data source at its exact value. This option is not supported for data from GE Historian.</li> </ul> <p><b>NOTE:</b> If you change the Data Conversion option from Range to Table, Format, or Object, the bottom half the dialog box changes accordingly.</p>
Output Error Mode	<p>Allows you to configure how an animation behaves if an error occurs. Depending on the type of data conversion, the output error mode can be any of the following:</p> <ul style="list-style-type: none"> <li>• <b>Use Current Output</b>- Displays the data exactly as it appeared in when the error occurred.</li> <li>• <b>Use Error Table</b>- Displays an error message that matches the current error, based on the error definitions in the Animations Data Error Defaults tab of the User Preferences dialog box.</li> <li>• <b>Use Minimum Value</b>- Displays the lowest possible value that is valid for the data source when an error occurs.</li> <li>• <b>Use Maximum Value</b>- Displays the highest possible value that is valid for the data source when an error occurs.</li> </ul>
Minimum Input	Allows you to specify the low limit value for incoming data.

Minimum Output	Allows you to apply linear signal conditioning to the data by mapping the range of input values specified in the Minimum and Maximum Input fields to a range of output values. Enter the minimum value, in logical units or postscript points, for the output range in this field.
Maximum Input	Allows you to specify the high limit value for incoming data.
Maximum Output	Allows you to apply linear signal conditioning to the data by mapping the range of input values specified in the Minimum and Maximum Input fields to a range of output values. Enter the maximum value, in logical units or postscript points, for the output range in this field.
Use Offset	Select this check box to perform an animation on an object in its current position, not in the absolute position specified by the logical unit or postscript point value in the Minimum Output field.
Fetch Input Range on Open	Select this check box to automatically fetch the minimum and maximum input values for the data source at run-time.

**NOTE:** Fetching data limits at runtime for an expression with more than one data source is not supported and may produce unexpected results at runtime. This is because there could be different tag names in the expression and it may not be clear which tag to fetch the limits for.

#### Historical Properties Tab

The Historical Properties tab allows you to set the parameters for a query that fetches historical data from GE Historian. The tab contains the following items:

**NOTE:** The following fields, with the exception of the Update Rate fields, are only available if you select a Historical Mode other than Current Value.

#### Start Date

Item	Description
Fixed Date	Specifies whether to enter a specific start date for the query of the data source.
Days Before Now	Specifies whether to enter the number of days prior to today to fetch data from GE Historian. For example, if you want to display data collected for the data source two days ago, enter 2.

#### Start Time

Item	Description
Fixed Time	Specifies whether to designate a specific time to start. If selected, allows you to enter an explicit start time.
Lock Time	Locks the Fixed Time, even if you change the time zone in the Date and Time Properties dialog box in the Control Panel. This field is available only when you designate a specific time to start using the Fixed Time field.
Duration Before Now	Specifies whether to enter the duration prior to the current time to start. The minimum duration is 0 seconds; the maximum is 23 hours, 59 minutes, and 59 seconds.

### Time Zone

Item	Description
Time Zone	Allows you to select the time zone to associate with the start time. You can select the client time (time zone for your computer), the server time (time zone used by the Historian server), or the tag time (uses the time zone bias of the tag, which is set in Historian). The default time zone is that of the client machine. This field is available only when Historian is used.
Adjust for Daylight Savings Time	Adjusts the time if the zone you selected is experiencing daylight saving. This field works only if you selected the Automatically adjust clock for daylight saving changes check box located on the Time Zone tab of the Date/Time Properties dialog box in the Control Panel.

### Historical Mode

Allows you to determine how iFIX selects and fetches data from a historical data source and, determines what each displayed value represents. The options are:

- Sample - The last valid value found, up to and including the start of the specified interval.
- Avg - The average of all valid data found during the specified interval.
- High - The highest valid data point value found during the specified interval.
- Low - The lowest valid data point value found during the specified interval.
- Interpolated - The data is interpreted by assuming that the line between two values is a straight line. All points along that line are estimated except the starting point and the ending point.
- Current Value - The current value of the data point.

**IMPORTANT:** The Current Value may update at a rate different from the rate set in the Update Rate field. The update rate is not set solely by the rate entered in the Update Rate field. It also depends on the collection rate, the rate for querying Historian, and the time required to request an update from the Historian server and send it back to the client. As a result, the time it takes to display the updates may be longer than anticipated. Additionally, please be aware that the timestamp for this mode represents the timestamp from the Historian server, not the client.

- Standard Deviation - The standard deviation of all valid data found during the specified interval.
- Total - The total of all valid data found during the specified interval.

### Duration

The duration determines the time range for the historical data source. The minimum duration for a fetch is one second; the maximum is 999 days, 23 hours, 59 minutes, and 59 seconds.

Item	Description
Days	Allows you to enter the number of days. This field can be used in conjunction with the other fields in this area.
Hours	Allows you to enter the number of hours for the duration for the data fetch query. This field can be used in conjunction with the other fields in this area.
Mins	Allows you to enter the number of minutes for the duration for the data fetch query. This field can be used in conjunction with the

	other fields in this area.
Secs	Allows you to enter the number of seconds for the duration for the data fetch query. This field can be used in conjunction with the other fields in this area.

#### Update Rate

Allows you to specify the rate at which the data is updated. The default rate is five seconds. Zero is permitted for a one-time fetch. The fastest update rate is five seconds, the slowest, 1:59:59.

Item	Description
Hours	Allows you to enter the number of hours for the rate of data update. This field can be used in conjunction with the other fields in this area.
Mins	Allows you to enter the number of minutes for the rate of data update. This field can be used in conjunction with the other fields in this area.
Secs	Allows you to enter the number of seconds for the rate of data update. This field can be used in conjunction with the other fields in this area.

### Color Tab - Advanced Animations Dialog Box

The Color tab of the Advanced Animations dialog box displays the following items:

#### Properties

Provides options that allow you to select the properties that you want to animate. For a brief description of each property, read the property description on the right side of the dialog box.

#### Animate

Select this check box to open dynamic settings for the visible property. When selected, the Dynamic Setting for Property area appears directly below the Properties area.

#### Dynamic Settings for Property

##### Data Source

Allows you to enter a data source or expression for this object.

*Data source* refers to a reference to a source of information, such as iFIX tagnames and historical files, or other OPC-compliant data servers. A data source may also consist of iFIX objects (such as shapes, charts, and variables) or 3rd party OLE controls.

*Expression* refers to constants, data sources, or a combination of constants and data sources that are connected with one or more operators. Use the Browse (...) button to open the Expression Builder dialog box. Use the Quick Modify button to modify a database block directly without launching the Database Manager.

#### Animations Properties Tab

The Animations Properties tab contains the following items:

Item	Description
Data Conversion	<p>Allows you to select the type of data conversion to apply to the data from the source listed in the Data Source field. A data conversion defines how the incoming data should be processed or formatted so that your objects behave according to the properties you have assigned to them. You can apply any of the following data conversion:</p> <ul style="list-style-type: none"> <li>• <b>Range</b> - uses a range of values on which to animate an object.</li> <li>• <b>Table</b> - attempts to match the incoming value from the data source to an entry in a lookup table. If a match occurs, the selected property is changed to match the output value.</li> <li>• <b>Format</b> - provides several options for formatting text data.</li> <li>• <b>Object</b> - processes the data received from the data source at its exact value. This option is not supported for data from GE Historian.</li> </ul> <p><b>NOTE:</b> If you change the Data Conversion option from Table to Range, Format, or Object, the bottom half the dialog box changes accordingly.</p>
Output Error Mode	<p>Allows you to configure how an animation behaves if an error occurs. Depending on the type of data conversion, the output error mode can be any of the following:</p> <ul style="list-style-type: none"> <li>• <b>Use Current Output</b> - Displays the data exactly as it appeared in when the error occurred.</li> <li>• <b>Use Error Table</b> - Displays an error message that matches the current error, based on the error definitions in the Animations Data Error Defaults tab of the User Preferences dialog box.</li> <li>• <b>Use Minimum Value</b> - Displays the lowest possible value that is valid for the data source when an error occurs.</li> <li>• <b>Use Maximum Value</b> - Displays the highest possible value that is valid for the data source when an error occurs.</li> </ul>
Exact Match	<p>Allows you to specify that incoming data must exactly match the configured input value in the lookup table in order to format the data as the corresponding output value.</p>
Range Comparison	<p>Allows you to specify that incoming data must fall within a range of input values in the lookup table in order to format the data as the corresponding output value.</p>
Insert Row	<p>Inserts a new row into the data conversion table.</p>
Modify Row	<p>Displays the <a href="#">New Level Dialog Box</a> so that you can modify an</p>

	existing row in the data conversion table.
Delete Row	Deletes an existing row of the data conversion table.
Advanced	Displays the <a href="#">Advanced Lookup Options Dialog Box</a> that allows you to configure several more lookup options.

#### Historical Properties Tab

The Historical Properties tab allows you to set the parameters for a query that fetches historical data from GE Historian. The tab contains the following items:

**NOTE:** The following fields, with the exception of the Update Rate fields, are only available if you select a Historical Mode other than Current Value.

##### Start Date

Item	Description
Fixed Date	Specifies whether to enter a specific start date for the query of the data source.
Days Before Now	Specifies whether to enter the number of days prior to today to fetch data from GE Historian. For example, if you want to display data collected for the data source two days ago, enter 2.

##### Start Time

Item	Description
Fixed Time	Specifies whether to designate a specific time to start. If selected, allows you to enter an explicit start time.
Lock Time	Locks the Fixed Time, even if you change the time zone in the Date and Time Properties dialog box in the Control Panel. This field is available only when you designate a specific time to start using the Fixed Time field.
Duration Before Now	Specifies whether to enter the duration prior to the current time to start. The minimum duration is 0 seconds; the maximum is 23 hours, 59 minutes, and 59 seconds.

##### Time Zone

Item	Description
Time Zone	Allows you to select the time zone to associate with the start time. You can select the client time (time zone for your computer), the server time (time zone used by the Historian server), or the tag time (uses the time zone bias of the tag, which is set in Historian). The default time zone is that of the client machine. This field is available only when Historian is used.
Adjust for Daylight Savings Time	Adjusts the time if the zone you selected is experiencing daylight saving. This field works only if you selected the Automatically adjust clock for daylight saving changes check box located on the Time Zone tab of the Date/Time Properties dialog box in the Control Panel.

#### **Historical Mode**

Allows you to determine how iFIX selects and fetches data from a historical data source and, determines what each displayed value represents. The options are:

- Sample - The last valid value found, up to and including the start of the specified interval.
- Avg - The average of all valid data found during the specified interval.
- High - The highest valid data point value found during the specified interval.
- Low - The lowest valid data point value found during the specified interval.
- Interpolated - The data is interpreted by assuming that the line between two values is a straight line. All points along that line are estimated except the starting point and the ending point.
- Current Value - The current value of the data point.

**IMPORTANT:** The Current Value may update at a rate different from the rate set in the Update Rate field. The update rate is not set solely by the rate entered in the Update Rate field. It also depends on the collection rate, the rate for querying Historian, and the time required to request an update from the Historian server and send it back to the client. As a result, the time it takes to display the updates may be longer than anticipated. Additionally, please be aware that the timestamp for this mode represents the timestamp from the Historian server, not the client.

- Standard Deviation - The standard deviation of all valid data found during the specified interval.
- Total - The total of all valid data found during the specified interval.

#### **Duration**

The duration determines the time range for the historical data source. The minimum duration for a fetch is one second; the maximum is 999 days, 23 hours, 59 minutes, and 59 seconds.

Item	Description
Days	Allows you to enter the number of days. This field can be used in conjunction with the other fields in this area.
Hours	Allows you to enter the number of hours for the duration for the data fetch query. This field can be used in conjunction with the other fields in this area.
Mins	Allows you to enter the number of minutes for the duration for the data fetch query. This field can be used in conjunction with the other fields in this area.
Secs	Allows you to enter the number of seconds for the duration for the data fetch query. This field can be used in conjunction with the other fields in this area.

#### **Update Rate**

Allows you to specify the rate at which the data is updated. The default rate is five seconds. Zero is permitted for a one-time fetch. The fastest update rate is five seconds, the slowest, 1:59:59.

Item	Description
Hours	Allows you to enter the number of hours for the rate of data update. This field can be used in conjunction with the other fields in this area.

Mins	Allows you to enter the number of minutes for the rate of data update. This field can be used in conjunction with the other fields in this area.
Secs	Allows you to enter the number of seconds for the rate of data update. This field can be used in conjunction with the other fields in this area.

## Style Tab - Advanced Animations Dialog Box

The Style tab of the Advanced Animations dialog box displays the following items:

### Properties

Provides options that allow you to select the properties that you want to animate. For a brief description of each property, read the property description on the right side of the dialog box.

### Animate

Select this check box to open dynamic settings for the visible property. When selected, the Dynamic Setting for Property area appears directly below the Properties area.

### Dynamic Settings for Property

#### Data Source

Allows you to enter a data source or expression for this object.

*Data source* refers to a reference to a source of information, such as iFIX tagnames and historical files, or other OPC-compliant data servers. A data source may also consist of iFIX objects (such as shapes, charts, and variables) or 3rd party OLE controls.

*Expression* refers to constants, data sources, or a combination of constants and data sources that are connected with one or more operators. Use the Browse (...) button to open the Expression Builder dialog box. Use the Quick Modify button to modify a database block directly without launching the Database Manager.

### Animations Properties Tab

The Animations Properties tab contains the following items:

Item	Description
Data Conversion	<p>Allows you to select the type of data conversion to apply to the data from the source listed in the Data Source field. A data conversion defines how the incoming data should be processed or formatted so that your objects behave according to the properties you have assigned to them. You can apply any of the following data conversion:</p> <ul style="list-style-type: none"> <li>• <b>Range</b> - uses a range of values on which to animate an object.</li> <li>• <b>Table</b> - attempts to match the incoming value from the data source to an entry in a lookup table. If a match occurs, the selected property is changed to match the output value.</li> </ul>

	<ul style="list-style-type: none"> <li><b>Format</b> - provides several options for formatting text data.</li> <li><b>Object</b> - processes the data received from the data source at its exact value. This option is not supported for data from GE Historian.</li> </ul> <p><b>NOTE:</b> If you change the Data Conversion option from Table to Range, Format, or Object, the bottom half the dialog box changes accordingly.</p>
Output Error Mode	<p>Allows you to configure how an animation behaves if an error occurs. Depending on the type of data conversion, the output error mode can be any of the following:</p> <ul style="list-style-type: none"> <li><b>Use Current Output</b> - Displays the data exactly as it appeared in when the error occurred.</li> <li><b>Use Error Table</b> - Displays an error message that matches the current error, based on the error definitions in the Animations Data Error Defaults tab of the User Preferences dialog box.</li> <li><b>Use Minimum Value</b> - Displays the lowest possible value that is valid for the data source when an error occurs.</li> <li><b>Use Maximum Value</b> - Displays the highest possible value that is valid for the data source when an error occurs.</li> </ul>
Exact Match	Allows you to specify that incoming data must exactly match the configured input value in the lookup table in order to format the data as the corresponding output value.
Range Comparison	Allows you to specify that incoming data must fall within a range of input values in the lookup table in order to format the data as the corresponding output value.
Insert Row	Inserts a new row into the data conversion table.
Modify Row	Displays the <a href="#">New Level Dialog Box</a> so that you can modify an existing row in the data conversion table.
Delete Row	Deletes an existing row of the data conversion table.
Advanced	Displays the <a href="#">Advanced Lookup Options Dialog Box</a> that allows you to configure several more lookup options.

#### Historical Properties Tab

The Historical Properties tab allows you to set the parameters for a query that fetches historical data from GE Historian. The tab contains the following items:

**NOTE:** The following fields, with the exception of the Update Rate fields, are only available if you select a Historical Mode other than Current Value.

##### Start Date

Item	Description
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Fixed Date	Specifies whether to enter a specific start date for the query of the data source.
Days Before Now	Specifies whether to enter the number of days prior to today to fetch data from GE Historian. For example, if you want to display data collected for the data source two days ago, enter 2.

#### Start Time

Item	Description
Fixed Time	Specifies whether to designate a specific time to start. If selected, allows you to enter an explicit start time.
Lock Time	Locks the Fixed Time, even if you change the time zone in the Date and Time Properties dialog box in the Control Panel. This field is available only when you designate a specific time to start using the Fixed Time field.
Duration Before Now	Specifies whether to enter the duration prior to the current time to start. The minimum duration is 0 seconds; the maximum is 23 hours, 59 minutes, and 59 seconds.

#### Time Zone

Item	Description
Time Zone	Allows you to select the time zone to associate with the start time. You can select the client time (time zone for your computer), the server time (time zone used by the Historian server), or the tag time (uses the time zone bias of the tag, which is set in Historian). The default time zone is that of the client machine. This field is available only when Historian is used.
Adjust for Daylight Savings Time	Adjusts the time if the zone you selected is experiencing daylight saving. This field works only if you selected the Automatically adjust clock for daylight saving changes check box located on the Time Zone tab of the Date/Time Properties dialog box in the Control Panel.

#### Historical Mode

Allows you to determine how iFIX selects and fetches data from a historical data source and, determines what each displayed value represents. The options are:

- Sample - The last valid value found, up to and including the start of the specified interval.
- Avg - The average of all valid data found during the specified interval.
- High - The highest valid data point value found during the specified interval.
- Low - The lowest valid data point value found during the specified interval.
- Interpolated - The data is interpreted by assuming that the line between two values is a straight line. All points along that line are estimated except the starting point and the ending point.
- Current Value - The current value of the data point.

**IMPORTANT:** The Current Value may update at a rate different from the rate set in the Update Rate field. The update rate is not set solely by the rate entered in the Update Rate field. It also depends on

the collection rate, the rate for querying Historian, and the time required to request an update from the Historian server and send it back to the client. As a result, the time it takes to display the updates may be longer than anticipated. Additionally, please be aware that the timestamp for this mode represents the timestamp from the Historian server, not the client.

- Standard Deviation - The standard deviation of all valid data found during the specified interval.
- Total - The total of all valid data found during the specified interval.

#### Duration

The duration determines the time range for the historical data source. The minimum duration for a fetch is one second; the maximum is 999 days, 23 hours, 59 minutes, and 59 seconds.

Item	Description
Days	Allows you to enter the number of days. This field can be used in conjunction with the other fields in this area.
Hours	Allows you to enter the number of hours for the duration for the data fetch query. This field can be used in conjunction with the other fields in this area.
Mins	Allows you to enter the number of minutes for the duration for the data fetch query. This field can be used in conjunction with the other fields in this area.
Secs	Allows you to enter the number of seconds for the duration for the data fetch query. This field can be used in conjunction with the other fields in this area.

#### Update Rate

Allows you to specify the rate at which the data is updated. The default rate is five seconds. Zero is permitted for a one-time fetch. The fastest update rate is five seconds, the slowest, 1:59:59.

Item	Description
Hours	Allows you to enter the number of hours for the rate of data update. This field can be used in conjunction with the other fields in this area.
Mins	Allows you to enter the number of minutes for the rate of data update. This field can be used in conjunction with the other fields in this area.
Secs	Allows you to enter the number of seconds for the rate of data update. This field can be used in conjunction with the other fields in this area.

#### Rotate Tab - Advanced Animations Dialog Box

The Rotate tab of the Advanced Animations dialog box displays the following items:

##### Properties

Provides options that allow you to select the properties that you want to animate. For a brief description of each property, read the property description on the right side of the dialog box.

#### Animate

Select this check box to open dynamic settings for the visible property. When selected, the Dynamic Setting for Property area appears directly below the Properties area.

#### Dynamic Settings for Property

##### Data Source

Allows you to enter a data source or expression for this object.

*Data source* refers to a reference to a source of information, such as iFIX tagnames and historical files, or other OPC-compliant data servers. A data source may also consist of iFIX objects (such as shapes, charts, and variables) or 3rd party OLE controls.

*Expression* refers to constants, data sources, or a combination of constants and data sources that are connected with one or more operators. Use the Browse (...) button to open the Expression Builder dialog box. Use the Quick Modify button to modify a database block directly without launching the Database Manager.

#### Animations Properties Tab

The Animations Properties tab contains the following items:

Item	Description
Data Conversion	<p>Allows you to select the type of data conversion to apply to the data from the source listed in the Data Source field. A data conversion defines how the incoming data should be processed or formatted so that your objects behave according to the properties you have assigned to them. You can apply any of the following data conversion:</p> <ul style="list-style-type: none"><li>• <b>Range</b> - uses a range of values on which to animate an object.</li><li>• <b>Table</b> - attempts to match the incoming value from the data source to an entry in a lookup table. If a match occurs, the selected property is changed to match the output value.</li><li>• <b>Format</b> - provides several options for formatting text data.</li><li>• <b>Object</b> - processes the data received from the data source at its exact value. This option is not supported for data from GE Historian.</li></ul> <p><b>NOTE:</b> If you change the Data Conversion option from Range to Table, Format, or Object, the bottom half the dialog box changes accordingly.</p>
Output Error Mode	<p>Allows you to configure how an animation behaves if an error occurs. Depending on the type of data conversion, the output error mode can be any of the following:</p> <ul style="list-style-type: none"><li>• <b>Use Current Output</b>- Displays the data exactly as it appeared in when the error occurred.</li></ul>

	<ul style="list-style-type: none"> <li><b>Use Error Table</b>- Displays an error message that matches the current error, based on the error definitions in the Animations Data Error Defaults tab of the User Preferences dialog box.</li> <li><b>Use Minimum Value</b>- Displays the lowest possible value that is valid for the data source when an error occurs.</li> <li><b>Use Maximum Value</b>- Displays the highest possible value that is valid for the data source when an error occurs.</li> </ul>
Minimum Input	Allows you to specify the low limit value for incoming data.
Minimum Output	Allows you to apply linear signal conditioning to the data by mapping the range of input values specified in the Minimum and Maximum Input fields to a range of output values. Enter the minimum value, in logical units or postscript points, for the output range in this field.
Maximum Input	Allows you to specify the high limit value for incoming data.
Maximum Output	Allows you to apply linear signal conditioning to the data by mapping the range of input values specified in the Minimum and Maximum Input fields to a range of output values. Enter the maximum value, in logical units or postscript points, for the output range in this field.
Fetch Input Range on Open	Select this check box to automatically fetch the minimum and maximum input values for the data source at run-time.

**NOTE:** Fetching data limits at runtime for an expression with more than one data source is not supported and may produce unexpected results at runtime. This is because there could be different tag names in the expression and it may not be clear which tag to fetch the limits for.

#### Historical Properties Tab

The Historical Properties tab allows you to set the parameters for a query that fetches historical data from GE Historian. The tab contains the following items:

**NOTE:** The following fields, with the exception of the Update Rate fields, are only available if you select a Historical Mode other than Current Value.

#### Start Date

Item	Description
Fixed Date	Specifies whether to enter a specific start date for the query of the data source.
Days Before Now	Specifies whether to enter the number of days prior to today to fetch data from GE Historian. For example, if you want to display data collected for the data source two days ago, enter 2.

#### Start Time

Item	Description
Fixed Time	Specifies whether to designate a specific time to start. If selected, allows you to enter an explicit start time.

Lock Time	Locks the Fixed Time, even if you change the time zone in the Date and Time Properties dialog box in the Control Panel. This field is available only when you designate a specific time to start using the Fixed Time field.
Duration Before Now	Specifies whether to enter the duration prior to the current time to start. The minimum duration is 0 seconds; the maximum is 23 hours, 59 minutes, and 59 seconds.

#### Time Zone

Item	Description
Time Zone	Allows you to select the time zone to associate with the start time. You can select the client time (time zone for your computer), the server time (time zone used by the Historian server), or the tag time (uses the time zone bias of the tag, which is set in Historian). The default time zone is that of the client machine. This field is available only when Historian is used.
Adjust for Daylight Savings Time	Adjusts the time if the zone you selected is experiencing daylight saving. This field works only if you selected the Automatically adjust clock for daylight saving changes check box located on the Time Zone tab of the Date/Time Properties dialog box in the Control Panel.

#### Historical Mode

Allows you to determine how iFIX selects and fetches data from a historical data source and, determines what each displayed value represents. The options are:

- Sample - The last valid value found, up to and including the start of the specified interval.
- Avg - The average of all valid data found during the specified interval.
- High - The highest valid data point value found during the specified interval.
- Low - The lowest valid data point value found during the specified interval.
- Interpolated - The data is interpreted by assuming that the line between two values is a straight line. All points along that line are estimated except the starting point and the ending point.
- Current Value - The current value of the data point.

**IMPORTANT:** The Current Value may update at a rate different from the rate set in the Update Rate field. The update rate is not set solely by the rate entered in the Update Rate field. It also depends on the collection rate, the rate for querying Historian, and the time required to request an update from the Historian server and send it back to the client. As a result, the time it takes to display the updates may be longer than anticipated. Additionally, please be aware that the timestamp for this mode represents the timestamp from the Historian server, not the client.

- Standard Deviation - The standard deviation of all valid data found during the specified interval.
- Total - The total of all valid data found during the specified interval.

#### Duration

The duration determines the time range for the historical data source. The minimum duration for a fetch is one second; the maximum is 999 days, 23 hours, 59 minutes, and 59 seconds.

Item	Description
Days	Allows you to enter the number of days. This field can be used in conjunction with the other fields in this area.
Hours	Allows you to enter the number of hours for the duration for the data fetch query. This field can be used in conjunction with the other fields in this area.
Mins	Allows you to enter the number of minutes for the duration for the data fetch query. This field can be used in conjunction with the other fields in this area.
Secs	Allows you to enter the number of seconds for the duration for the data fetch query. This field can be used in conjunction with the other fields in this area.

#### Update Rate

Allows you to specify the rate at which the data is updated. The default rate is five seconds. Zero is permitted for a one-time fetch. The fastest update rate is five seconds, the slowest, 1:59:59.

Item	Description
Hours	Allows you to enter the number of hours for the rate of data update. This field can be used in conjunction with the other fields in this area.
Mins	Allows you to enter the number of minutes for the rate of data update. This field can be used in conjunction with the other fields in this area.
Secs	Allows you to enter the number of seconds for the rate of data update. This field can be used in conjunction with the other fields in this area.

#### Fill Tab - Advanced Animations Dialog Box

The Fill tab of the Advanced Animations dialog box displays the following items:

##### Properties

Provides options that allow you to select the properties that you want to animate. For a brief description of each property, read the property description on the right side of the dialog box.

##### Animate

Select this check box to open dynamic settings for the visible property. When selected, the Dynamic Setting for Property area appears directly below the Properties area.

##### Dynamic Settings for Property

##### Data Source

Allows you to enter a data source or expression for this object.

*Data source* refers to a reference to a source of information, such as iFIX tagnames and historical files, or other OPC-compliant data servers. A data source may also consist of iFIX objects (such as shapes, charts, and variables) or 3rd party OLE controls.

*Expression* refers to constants, data sources, or a combination of constants and data sources that are connected with one or more operators. Use the Browse (...) button to open the Expression Builder dialog box. Use the Quick Modify button to modify a database block directly without launching the Database Manager.

#### Animation Properties Tab

The Animation Properties tab contains the following items:

Item	Description
Data Conversion	<p>Allows you to select the type of data conversion to apply to the data from the source listed in the Data Source field. A data conversion defines how the incoming data should be processed or formatted so that your objects behave according to the properties you have assigned to them. You can apply any of the following data conversion:</p> <ul style="list-style-type: none"> <li>• <b>Range</b> - uses a range of values on which to animate an object.</li> <li>• <b>Table</b> - attempts to match the incoming value from the data source to an entry in a lookup table. If a match occurs, the selected property is changed to match the output value.</li> <li>• <b>Format</b> - provides several options for formatting text data.</li> <li>• <b>Object</b> - processes the data received from the data source at its exact value. This option is not supported for data from GE Historian.</li> </ul> <p><b>NOTE:</b> If you change the Data Conversion option from Range to Table, Format, or Object, the bottom half the dialog box changes accordingly.</p>
Output Error Mode	<p>Allows you to configure how an animation behaves if an error occurs. Depending on the type of data conversion, the output error mode can be any of the following:</p> <ul style="list-style-type: none"> <li>• <b>Use Current Output</b>- Displays the data exactly as it appeared in when the error occurred.</li> <li>• <b>Use Error Table</b>- Displays an error message that matches the current error, based on the error definitions in the Animations Data Error Defaults tab of the User Preferences dialog box.</li> <li>• <b>Use Minimum Value</b>- Displays the lowest possible value that is valid for the data source when an error occurs.</li> <li>• <b>Use Maximum Value</b>- Displays the highest possible value that is valid for the data source when an error occurs.</li> </ul>
Minimum Input	Allows you to specify the low limit value for incoming data.

Minimum Output	Allows you to apply linear signal conditioning to the data by mapping the range of input values specified in the Minimum and Maximum Input fields to a range of output values. Enter the minimum value, in logical units or postscript points, for the output range in this field.
Maximum Input	Allows you to specify the high limit value for incoming data.
Maximum Output	Allows you to apply linear signal conditioning to the data by mapping the range of input values specified in the Minimum and Maximum Input fields to a range of output values. Enter the maximum value, in logical units or postscript points, for the output range in this field.
Fetch Input Range on Open	Select this check box to automatically fetch the minimum and maximum input values for the data source at run-time.

**NOTE:** Fetching data limits at runtime for an expression with more than one data source is not supported and may produce unexpected results at runtime. This is because there could be different tag names in the expression and it may not be clear which tag to fetch the limits for.

#### Historical Properties Tab

The Historical Properties tab allows you to set the parameters for a query that fetches historical data from GE Historian. The tab contains the following items:

**NOTE:** The following fields, with the exception of the Update Rate fields, are only available if you select a Historical Mode other than Current Value.

##### Start Date

Item	Description
Fixed Date	Specifies whether to enter a specific start date for the query of the data source.
Days Before Now	Specifies whether to enter the number of days prior to today to fetch data from GE Historian. For example, if you want to display data collected for the data source two days ago, enter 2.

##### Start Time

Item	Description
Fixed Time	Specifies whether to designate a specific time to start. If selected, allows you to enter an explicit start time.
Lock Time	Locks the Fixed Time, even if you change the time zone in the Date and Time Properties dialog box in the Control Panel. This field is available only when you designate a specific time to start using the Fixed Time field.
Duration Before Now	Specifies whether to enter the duration prior to the current time to start. The minimum duration is 0 seconds; the maximum is 23 hours, 59 minutes, and 59 seconds.

##### Time Zone

Item	Description
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Time Zone	Allows you to select the time zone to associate with the start time. You can select the client time (time zone for your computer), the server time (time zone used by the Historian server), or the tag time (uses the time zone bias of the tag, which is set in Historian). The default time zone is that of the client machine. This field is available only when Historian is used.
Adjust for Daylight Savings Time	Adjusts the time if the zone you selected is experiencing daylight saving. This field works only if you selected the Automatically adjust clock for daylight saving changes check box located on the Time Zone tab of the Date/Time Properties dialog box in the Control Panel.

#### Historical Mode

Allows you to determine how iFIX selects and fetches data from a historical data source and, determines what each displayed value represents. The options are:

- Sample - The last valid value found, up to and including the start of the specified interval.
- Avg - The average of all valid data found during the specified interval.
- High - The highest valid data point value found during the specified interval.
- Low - The lowest valid data point value found during the specified interval.
- Interpolated - The data is interpreted by assuming that the line between two values is a straight line. All points along that line are estimated except the starting point and the ending point.
- Current Value - The current value of the data point.

**IMPORTANT:** The Current Value may update at a rate different from the rate set in the Update Rate field. The update rate is not set solely by the rate entered in the Update Rate field. It also depends on the collection rate, the rate for querying Historian, and the time required to request an update from the Historian server and send it back to the client. As a result, the time it takes to display the updates may be longer than anticipated. Additionally, please be aware that the timestamp for this mode represents the timestamp from the Historian server, not the client.

- Standard Deviation - The standard deviation of all valid data found during the specified interval.
- Total - The total of all valid data found during the specified interval.

#### Duration

The duration determines the time range for the historical data source. The minimum duration for a fetch is one second; the maximum is 999 days, 23 hours, 59 minutes, and 59 seconds.

Item	Description
Days	Allows you to enter the number of days. This field can be used in conjunction with the other fields in this area.
Hours	Allows you to enter the number of hours for the duration for the data fetch query. This field can be used in conjunction with the other fields in this area.
Mins	Allows you to enter the number of minutes for the duration for the data fetch query. This field can be used in conjunction with the other fields in this area.
Secs	Allows you to enter the number of seconds for the duration for the data fetch query. This field can be used in conjunction with the

other fields in this area.

#### Update Rate

Allows you to specify the rate at which the data is updated. The default rate is five seconds. Zero is permitted for a one-time fetch. The fastest update rate is five seconds, the slowest, 1:59:59.

Item	Description
Hours	Allows you to enter the number of hours for the rate of data update. This field can be used in conjunction with the other fields in this area.
Mins	Allows you to enter the number of minutes for the rate of data update. This field can be used in conjunction with the other fields in this area.
Secs	Allows you to enter the number of seconds for the rate of data update. This field can be used in conjunction with the other fields in this area.

### Gradient Tab - Advanced Animations Dialog Box

The Gradient tab of the Advanced Animations dialog box displays the following items:

#### Properties

Provides options that allow you to select the properties that you want to animate. For a brief description of each property, read the property description on the right side of the dialog box.

#### Animate

Select this check box to open dynamic settings for the visible property. When selected, the Dynamic Setting for Property area appears directly below the Properties area.

#### Dynamic Settings for Property

#### Data Source

Allows you to enter a data source or expression for this object.

*Data source* refers to a reference to a source of information, such as iFIX tagnames and historical files, or other OPC-compliant data servers. A data source may also consist of iFIX objects (such as shapes, charts, and variables) or 3rd party OLE controls.

*Expression* refers to constants, data sources, or a combination of constants and data sources that are connected with one or more operators. Use the Browse (...) button to open the Expression Builder dialog box. Use the Quick Modify button to modify a database block directly without launching the Database Manager.

#### Animation Properties Tab

The Animation Properties tab contains the following items:

Item	Description
Data Conversion	Allows you to select the type of data conversion to apply to the data from the source listed in the Data Source field. A data con-

	<p>version defines how the incoming data should be processed or formatted so that your objects behave according to the properties you have assigned to them. You can apply any of the following data conversion:</p> <ul style="list-style-type: none"> <li>• <b>Range</b> - uses a range of values on which to animate an object.</li> <li>• <b>Table</b> - attempts to match the incoming value from the data source to an entry in a lookup table. If a match occurs, the selected property is changed to match the output value.</li> <li>• <b>Format</b> - provides several options for formatting text data.</li> <li>• <b>Object</b> - processes the data received from the data source at its exact value. This option is not supported for data from GE Historian.</li> </ul> <p><b>NOTE:</b> If you change the Data Conversion option from Table to Range, Format, or Object, the bottom half the dialog box changes accordingly.</p>
Output Error Mode	<p>Allows you to configure how an animation behaves if an error occurs. Depending on the type of data conversion, the output error mode can be any of the following:</p> <ul style="list-style-type: none"> <li>• <b>Use Current Output</b> - Displays the data exactly as it appeared in when the error occurred.</li> <li>• <b>Use Error Table</b> - Displays an error message that matches the current error, based on the error definitions in the Animations Data Error Defaults tab of the User Preferences dialog box.</li> <li>• <b>Use Minimum Value</b> - Displays the lowest possible value that is valid for the data source when an error occurs.</li> <li>• <b>Use Maximum Value</b> - Displays the highest possible value that is valid for the data source when an error occurs.</li> </ul>
Exact Match	Allows you to specify that incoming data must exactly match the configured input value in the lookup table in order to format the data as the corresponding output value.
Range Comparison	Allows you to specify that incoming data must fall within a range of input values in the lookup table in order to format the data as the corresponding output value.
Insert Row	Inserts a new row into the data conversion table.
Modify Row	Displays the <a href="#">New Level Dialog Box</a> so that you can modify an existing row in the data conversion table.
Delete Row	Deletes an existing row of the data conversion table.
Advanced	Displays the <a href="#">Advanced Lookup Options Dialog Box</a> that allows

you to configure several more lookup options.

#### Historical Properties Tab

The Historical Properties tab allows you to set the parameters for a query that fetches historical data from GE Historian. The tab contains the following items:

**NOTE:** The following fields, with the exception of the Update Rate fields, are only available if you select a Historical Mode other than Current Value.

##### Start Date

Item	Description
Fixed Date	Specifies whether to enter a specific start date for the query of the data source.
Days Before Now	Specifies whether to enter the number of days prior to today to fetch data from GE Historian. For example, if you want to display data collected for the data source two days ago, enter 2.

##### Start Time

Item	Description
Fixed Time	Specifies whether to designate a specific time to start. If selected, allows you to enter an explicit start time.
Lock Time	Locks the Fixed Time, even if you change the time zone in the Date and Time Properties dialog box in the Control Panel. This field is available only when you designate a specific time to start using the Fixed Time field.
Duration Before Now	Specifies whether to enter the duration prior to the current time to start. The minimum duration is 0 seconds; the maximum is 23 hours, 59 minutes, and 59 seconds.

##### Time Zone

Item	Description
Time Zone	Allows you to select the time zone to associate with the start time. You can select the client time (time zone for your computer), the server time (time zone used by the Historian server), or the tag time (uses the time zone bias of the tag, which is set in Historian). The default time zone is that of the client machine. This field is available only when Historian is used.
Adjust for Daylight Savings Time	Adjusts the time if the zone you selected is experiencing daylight saving. This field works only if you selected the Automatically adjust clock for daylight saving changes check box located on the Time Zone tab of the Date/Time Properties dialog box in the Control Panel.

##### Historical Mode

Allows you to determine how iFIX selects and fetches data from a historical data source and, determines what each displayed value represents. The options are:

- Sample - The last valid value found, up to and including the start of the specified interval.
- Avg - The average of all valid data found during the specified interval.
- High - The highest valid data point value found during the specified interval.
- Low - The lowest valid data point value found during the specified interval.
- Interpolated - The data is interpreted by assuming that the line between two values is a straight line. All points along that line are estimated except the starting point and the ending point.
- Current Value - The current value of the data point.

**IMPORTANT:** The Current Value may update at a rate different from the rate set in the Update Rate field. The update rate is not set solely by the rate entered in the Update Rate field. It also depends on the collection rate, the rate for querying Historian, and the time required to request an update from the Historian server and send it back to the client. As a result, the time it takes to display the updates may be longer than anticipated. Additionally, please be aware that the timestamp for this mode represents the timestamp from the Historian server, not the client.

- Standard Deviation - The standard deviation of all valid data found during the specified interval.
- Total - The total of all valid data found during the specified interval.

#### Duration

The duration determines the time range for the historical data source. The minimum duration for a fetch is one second; the maximum is 999 days, 23 hours, 59 minutes, and 59 seconds.

Item	Description
Days	Allows you to enter the number of days. This field can be used in conjunction with the other fields in this area.
Hours	Allows you to enter the number of hours for the duration for the data fetch query. This field can be used in conjunction with the other fields in this area.
Mins	Allows you to enter the number of minutes for the duration for the data fetch query. This field can be used in conjunction with the other fields in this area.
Secs	Allows you to enter the number of seconds for the duration for the data fetch query. This field can be used in conjunction with the other fields in this area.

#### Update Rate

Allows you to specify the rate at which the data is updated. The default rate is five seconds. Zero is permitted for a one-time fetch. The fastest update rate is five seconds, the slowest, 1:59:59.

Item	Description
Hours	Allows you to enter the number of hours for the rate of data update. This field can be used in conjunction with the other fields in this area.
Mins	Allows you to enter the number of minutes for the rate of data update. This field can be used in conjunction with the other fields in this area.
Secs	Allows you to enter the number of seconds for the rate of data

update. This field can be used in conjunction with the other fields in this area.

## Text Tab - Advanced Animations Dialog Box

The Text tab of the Advanced Animations dialog box displays the following items:

### Properties

Provides options that allow you to select the properties that you want to animate. For a brief description of each property, read the property description on the right side of the dialog box.

### Animate

Select this check box to open dynamic settings for the visible property. When selected, the Dynamic Setting for Property area appears directly below the Properties area.

### Dynamic Settings for Property

#### Data Source

Allows you to enter a data source or expression for this object.

*Data source* refers to a reference to a source of information, such as iFIX tagnames and historical files, or other OPC-compliant data servers. A data source may also consist of iFIX objects (such as shapes, charts, and variables) or 3rd party OLE controls.

*Expression* refers to constants, data sources, or a combination of constants and data sources that are connected with one or more operators. Use the Browse (...) button to open the Expression Builder dialog box. Use the Quick Modify button to modify a database block directly without launching the Database Manager.

### Animation Properties Tab

The Animation Properties tab contains the following items:

Item	Description
Data Conversion	<p>Allows you to select the type of data conversion to apply to the data from the source listed in the Data Source field. A data conversion defines how the incoming data should be processed or formatted so that your objects behave according to the properties you have assigned to them. You can apply any of the following data conversion:</p> <ul style="list-style-type: none"><li>• <b>Range</b> - uses a range of values on which to animate an object.</li><li>• <b>Table</b> - attempts to match the incoming value from the data source to an entry in a lookup table. If a match occurs, the selected property is changed to match the output value.</li><li>• <b>Format</b> - provides several options for formatting text data.</li><li>• <b>Object</b> - processes the data received from the data</li></ul>

	<p>source at its exact value. This option is not supported for data from GE Historian.</p> <p><b>NOTE:</b> If you change the Data Conversion option from Format to Range, Table, or Object, the bottom half the dialog box changes accordingly.</p>
Output Error Mode	<p>Allows you to configure how an animation behaves if an error occurs. Depending on the type of data conversion, the output error mode can be any of the following:</p> <ul style="list-style-type: none"> <li>• <b>Use Current Output</b> - Displays the data exactly as it appeared in when the error occurred.</li> <li>• <b>Use Error Table</b> - Displays an error message that matches the current error, based on the error definitions in the Animations Data Error Defaults tab of the User Preferences dialog box.</li> </ul>
Type	<p>Allows you to configure whether or not operators can enter data into the animation at run-time. To allow operators to enter data into animation and write a new value to the database tag during the next scan cycle, select In-Place from the list. To prohibit data entry at run-time, select None.</p>
Confirm	<p>When selected, requires operators to confirm that they want to write data to the database after they have entered a new value into the animation at run-time.</p> <p>This option is only available if In-Place is selected in the Data Entry Type list.</p>
Raw Format	<p>Allows you to enter data in its raw (or native C code) format. If this check box is enabled, you can edit the format by entering a C format string in the Format field.</p>
Format	<p>Allows you to enter a C format string to display data in its raw, native C code format. You can also enter a string of any kind preceding the raw format string (for example, to introduce what the data string represents).</p> <p>This option is only available if Raw Format is selected.</p>
Justify	<p>Allows you to justify the alignment (left, center, or right) of data in the animation.</p> <p>This option is only available if the Raw Format check box is cleared.</p>
Type	<p>Allows you to configure whether the data represented by the animation should be formatted as numeric or alphanumeric data. To format numeric data, select Numeric from this list and enter an integer from 0 to 7 in the Whole Digits field and 0 to 5 in the Decimal field. To format alpha-numeric data, select Alpha-Numeric from this list and enter the number of lines and the desired number of characters per line.</p> <p>This option is only available if the Raw Format check box is</p>

	cleared.
Lines	Allows you to enter the number of lines that you want to display in an alpha-numerically formatted animation.  This option is only available if the Raw Format check box is cleared.
Chars/Line	Allows you to enter the number of characters per line that you want to display in an alpha-numerically formatted animation.  This option is only available if the Raw Format check box is cleared.

#### Historical Properties Tab

The Historical Properties tab allows you to set the parameters for a query that fetches historical data from GE Historian. The tab contains the following items:

**NOTE:** The following fields, with the exception of the Update Rate fields, are only available if you select a Historical Mode other than Current Value.

##### Start Date

Item	Description
Fixed Date	Specifies whether to enter a specific start date for the query of the data source.
Days Before Now	Specifies whether to enter the number of days prior to today to fetch data from GE Historian. For example, if you want to display data collected for the data source two days ago, enter 2.

##### Start Time

Item	Description
Fixed Time	Specifies whether to designate a specific time to start. If selected, allows you to enter an explicit start time.
Lock Time	Locks the Fixed Time, even if you change the time zone in the Date and Time Properties dialog box in the Control Panel. This field is available only when you designate a specific time to start using the Fixed Time field.
Duration Before Now	Specifies whether to enter the duration prior to the current time to start. The minimum duration is 0 seconds; the maximum is 23 hours, 59 minutes, and 59 seconds.

##### Time Zone

Item	Description
Time Zone	Allows you to select the time zone to associate with the start time. You can select the client time (time zone for your computer), the server time (time zone used by the Historian server), or the tag time (uses the time zone bias of the tag, which is set in Historian). The default time zone is that of the client machine. This field is available only when Historian is used.

Adjust for Daylight Savings Time	Adjusts the time if the zone you selected is experiencing daylight saving. This field works only if you selected the Automatically adjust clock for daylight saving changes check box located on the Time Zone tab of the Date/Time Properties dialog box in the Control Panel.
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#### Historical Mode

Allows you to determine how iFIX selects and fetches data from a historical data source and, determines what each displayed value represents. The options are:

- Sample - The last valid value found, up to and including the start of the specified interval.
- Avg - The average of all valid data found during the specified interval.
- High - The highest valid data point value found during the specified interval.
- Low - The lowest valid data point value found during the specified interval.
- Interpolated - The data is interpreted by assuming that the line between two values is a straight line. All points along that line are estimated except the starting point and the ending point.
- Current Value - The current value of the data point.

**IMPORTANT:** The Current Value may update at a rate different from the rate set in the Update Rate field. The update rate is not set solely by the rate entered in the Update Rate field. It also depends on the collection rate, the rate for querying Historian, and the time required to request an update from the Historian server and send it back to the client. As a result, the time it takes to display the updates may be longer than anticipated. Additionally, please be aware that the timestamp for this mode represents the timestamp from the Historian server, not the client.

- Standard Deviation - The standard deviation of all valid data found during the specified interval.
- Total - The total of all valid data found during the specified interval.

#### Duration

The duration determines the time range for the historical data source. The minimum duration for a fetch is one second; the maximum is 999 days, 23 hours, 59 minutes, and 59 seconds.

Item	Description
Days	Allows you to enter the number of days. This field can be used in conjunction with the other fields in this area.
Hours	Allows you to enter the number of hours for the duration for the data fetch query. This field can be used in conjunction with the other fields in this area.
Mins	Allows you to enter the number of minutes for the duration for the data fetch query. This field can be used in conjunction with the other fields in this area.
Secs	Allows you to enter the number of seconds for the duration for the data fetch query. This field can be used in conjunction with the other fields in this area.

#### Update Rate

Allows you to specify the rate at which the data is updated. The default rate is five seconds. Zero is permitted for a one-time fetch. The fastest update rate is five seconds, the slowest, 1:59:59.

Item	Description
Hours	Allows you to enter the number of hours for the rate of data update. This field can be used in conjunction with the other fields in this area.
Mins	Allows you to enter the number of minutes for the rate of data update. This field can be used in conjunction with the other fields in this area.
Secs	Allows you to enter the number of seconds for the rate of data update. This field can be used in conjunction with the other fields in this area.

## Behavior Tab - Advanced Animations Dialog Box

The Behavior tab of the Advanced Animations dialog box displays the following items:

### Properties

Provides options that allow you to select the properties that you want to animate. For a brief description of each property, read the property description on the right side of the dialog box.

### Animate

Select this check box to open dynamic settings for the visible property. When selected, the Dynamic Setting for Property area appears directly below the Properties area.

### Dynamic Settings for Property

#### Data Source

Allows you to enter a data source or expression for this object.

*Data source* refers to a reference to a source of information, such as iFIX tagnames and historical files, or other OPC-compliant data servers. A data source may also consist of iFIX objects (such as shapes, charts, and variables) or 3rd party OLE controls.

*Expression* refers to constants, data sources, or a combination of constants and data sources that are connected with one or more operators. Use the Browse (...) button to open the Expression Builder dialog box. Use the Quick Modify button to modify a database block directly without launching the Database Manager.

### Animation Properties Tab

The Animation Properties tab contains the following items:

Item	Description
Data Conversion	<p>Allows you to select the type of data conversion to apply to the data from the source listed in the Data Source field. A data conversion defines how the incoming data should be processed or formatted so that your objects behave according to the properties you have assigned to them. You can apply any of the following data conversion:</p> <ul style="list-style-type: none"> <li>• <b>Range</b> - uses a range of values on which to animate an object.</li> </ul>

	<ul style="list-style-type: none"> <li>• <b>Table</b> - attempts to match the incoming value from the data source to an entry in a lookup table. If a match occurs, the selected property is changed to match the output value.</li> <li>• <b>Format</b> - provides several options for formatting text data.</li> <li>• <b>Object</b> - processes the data received from the data source at its exact value. This option is not supported for data from GE Historian.</li> </ul> <p><b>NOTE:</b> If you change the Data Conversion option from Table to Range, Format, or Object, the bottom half the dialog box changes accordingly.</p>
Output Error Mode	<p>Allows you to configure how an animation behaves if an error occurs. Depending on the type of data conversion, the output error mode can be any of the following:</p> <ul style="list-style-type: none"> <li>• <b>Use Current Output</b> - Displays the data exactly as it appeared in when the error occurred.</li> <li>• <b>Use Error Table</b> - Displays an error message that matches the current error, based on the error definitions in the Animations Data Error Defaults tab of the User Preferences dialog box.</li> <li>• <b>Use Minimum Value</b> - Displays the lowest possible value that is valid for the data source when an error occurs.</li> <li>• <b>Use Maximum Value</b> - Displays the highest possible value that is valid for the data source when an error occurs.</li> </ul>
Exact Match	Allows you to specify that incoming data must exactly match the configured input value in the lookup table in order to format the data as the corresponding output value.
Range Comparison	Allows you to specify that incoming data must fall within a range of input values in the lookup table in order to format the data as the corresponding output value.
Insert Row	Inserts a new row into the data conversion table.
Modify Row	Displays the <a href="#">New Level Dialog Box</a> so that you can modify an existing row in the data conversion table.
Delete Row	Deletes an existing row of the data conversion table.
Advanced	Displays the <a href="#">Advanced Lookup Options Dialog Box</a> that allows you to configure several more lookup options.

#### Historical Properties Tab

The Historical Properties tab allows you to set the parameters for a query that fetches historical data from GE Historian. The tab contains the following items:

**NOTE:** The following fields, with the exception of the Update Rate fields, are only available if you select a Historical Mode other than Current Value.

#### Start Date

Item	Description
Fixed Date	Specifies whether to enter a specific start date for the query of the data source.
Days Before Now	Specifies whether to enter the number of days prior to today to fetch data from GE Historian. For example, if you want to display data collected for the data source two days ago, enter 2.

#### Start Time

Item	Description
Fixed Time	Specifies whether to designate a specific time to start. If selected, allows you to enter an explicit start time.
Lock Time	Locks the Fixed Time, even if you change the time zone in the Date and Time Properties dialog box in the Control Panel. This field is available only when you designate a specific time to start using the Fixed Time field.
Duration Before Now	Specifies whether to enter the duration prior to the current time to start. The minimum duration is 0 seconds; the maximum is 23 hours, 59 minutes, and 59 seconds.

#### Time Zone

Item	Description
Time Zone	Allows you to select the time zone to associate with the start time. You can select the client time (time zone for your computer), the server time (time zone used by the Historian server), or the tag time (uses the time zone bias of the tag, which is set in Historian). The default time zone is that of the client machine. This field is available only when Historian is used.
Adjust for Daylight Savings Time	Adjusts the time if the zone you selected is experiencing daylight saving. This field works only if you selected the Automatically adjust clock for daylight saving changes check box located on the Time Zone tab of the Date/Time Properties dialog box in the Control Panel.

#### Historical Mode

Allows you to determine how iFIX selects and fetches data from a historical data source and, determines what each displayed value represents. The options are:

- Sample - The last valid value found, up to and including the start of the specified interval.
- Avg - The average of all valid data found during the specified interval.
- High - The highest valid data point value found during the specified interval.
- Low - The lowest valid data point value found during the specified interval.

- Interpolated - The data is interpreted by assuming that the line between two values is a straight line. All points along that line are estimated except the starting point and the ending point.
- Current Value - The current value of the data point.

**IMPORTANT:** The Current Value may update at a rate different from the rate set in the Update Rate field. The update rate is not set solely by the rate entered in the Update Rate field. It also depends on the collection rate, the rate for querying Historian, and the time required to request an update from the Historian server and send it back to the client. As a result, the time it takes to display the updates may be longer than anticipated. Additionally, please be aware that the timestamp for this mode represents the timestamp from the Historian server, not the client.

- Standard Deviation - The standard deviation of all valid data found during the specified interval.
- Total - The total of all valid data found during the specified interval.

#### Duration

The duration determines the time range for the historical data source. The minimum duration for a fetch is one second; the maximum is 999 days, 23 hours, 59 minutes, and 59 seconds.

Item	Description
Days	Allows you to enter the number of days. This field can be used in conjunction with the other fields in this area.
Hours	Allows you to enter the number of hours for the duration for the data fetch query. This field can be used in conjunction with the other fields in this area.
Mins	Allows you to enter the number of minutes for the duration for the data fetch query. This field can be used in conjunction with the other fields in this area.
Secs	Allows you to enter the number of seconds for the duration for the data fetch query. This field can be used in conjunction with the other fields in this area.

#### Update Rate

Allows you to specify the rate at which the data is updated. The default rate is five seconds. Zero is permitted for a one-time fetch. The fastest update rate is five seconds, the slowest, 1:59:59.

Item	Description
Hours	Allows you to enter the number of hours for the rate of data update. This field can be used in conjunction with the other fields in this area.
Mins	Allows you to enter the number of minutes for the rate of data update. This field can be used in conjunction with the other fields in this area.
Secs	Allows you to enter the number of seconds for the rate of data update. This field can be used in conjunction with the other fields in this area.

#### Appearance Tab - Advanced Animations Dialog Box

The Appearance tab of the Advanced Animations dialog box displays the following items:

## Properties

Provides options that allow you to select the properties that you want to animate. For a brief description of each property, read the property description on the right side of the dialog box.

### Animate

Select this check box to open dynamic settings for the visible property. When selected, the Dynamic Setting for Property area appears directly below the Properties area.

#### Dynamic Settings for Property

##### Data Source

Allows you to enter a data source or expression for this object.

*Data source* refers to a reference to a source of information, such as iFIX tagnames and historical files, or other OPC-compliant data servers. A data source may also consist of iFIX objects (such as shapes, charts, and variables) or 3rd party OLE controls.

*Expression* refers to constants, data sources, or a combination of constants and data sources that are connected with one or more operators. Use the Browse (...) button to open the Expression Builder dialog box. Use the Quick Modify button to modify a database block directly without launching the Database Manager.

#### Animation Properties Tab

The Animation Properties tab contains the following items:

Item	Description
Data Conversion	<p>Allows you to select the type of data conversion to apply to the data from the source listed in the Data Source field. A data conversion defines how the incoming data should be processed or formatted so that your objects behave according to the properties you have assigned to them. You can apply any of the following data conversion:</p> <ul style="list-style-type: none"><li>• <b>Range</b> - uses a range of values on which to animate an object.</li><li>• <b>Table</b> - attempts to match the incoming value from the data source to an entry in a lookup table. If a match occurs, the selected property is changed to match the output value.</li><li>• <b>Format</b> - provides several options for formatting text data.</li><li>• <b>Object</b> - processes the data received from the data source at its exact value. This option is not supported for data from GE Historian.</li></ul> <p><b>NOTE:</b> If you change the Data Conversion option from Range to Table, Format, or Object, the bottom half the dialog box changes accordingly.</p>
Output Error Mode	Allows you to configure how an animation behaves if an error

	<p>occurs. Depending on the type of data conversion, the output error mode can be any of the following:</p> <ul style="list-style-type: none"> <li>• <b>Use Current Output</b>- Displays the data exactly as it appeared in when the error occurred.</li> <li>• <b>Use Error Table</b>- Displays an error message that matches the current error, based on the error definitions in the Animations Data Error Defaults tab of the User Preferences dialog box.</li> <li>• <b>Use Minimum Value</b>- Displays the lowest possible value that is valid for the data source when an error occurs.</li> <li>• <b>Use Maximum Value</b>- Displays the highest possible value that is valid for the data source when an error occurs.</li> </ul>
Minimum Input	Allows you to specify the low limit value for incoming data.
Minimum Output	Allows you to apply linear signal conditioning to the data by mapping the range of input values specified in the Minimum and Maximum Input fields to a range of output values. Enter the minimum value, in logical units or postscript points, for the output range in this field.
Maximum Input	Allows you to specify the high limit value for incoming data.
Maximum Output	Allows you to apply linear signal conditioning to the data by mapping the range of input values specified in the Minimum and Maximum Input fields to a range of output values. Enter the maximum value, in logical units or postscript points, for the output range in this field.
Fetch Input Range on Open	Select this check box to automatically fetch the minimum and maximum input values for the data source at run-time.

**NOTE:** Fetching data limits at runtime for an expression with more than one data source is not supported and may produce unexpected results at runtime. This is because there could be different tag names in the expression and it may not be clear which tag to fetch the limits for.

#### Historical Properties Tab

The Historical Properties tab allows you to set the parameters for a query that fetches historical data from GE Historian. The tab contains the following items:

**NOTE:** The following fields, with the exception of the Update Rate fields, are only available if you select a Historical Mode other than Current Value.

#### Start Date

Item	Description
Fixed Date	Specifies whether to enter a specific start date for the query of the data source.
Days Before Now	Specifies whether to enter the number of days prior to today to fetch data from GE Historian. For example, if you want to display data collected for the data source two days ago, enter 2.

### Start Time

Item	Description
Fixed Time	Specifies whether to designate a specific time to start. If selected, allows you to enter an explicit start time.
Lock Time	Locks the Fixed Time, even if you change the time zone in the Date and Time Properties dialog box in the Control Panel. This field is available only when you designate a specific time to start using the Fixed Time field.
Duration Before Now	Specifies whether to enter the duration prior to the current time to start. The minimum duration is 0 seconds; the maximum is 23 hours, 59 minutes, and 59 seconds.

### Time Zone

Item	Description
Time Zone	Allows you to select the time zone to associate with the start time. You can select the client time (time zone for your computer), the server time (time zone used by the Historian server), or the tag time (uses the time zone bias of the tag, which is set in Historian). The default time zone is that of the client machine. This field is available only when Historian is used.
Adjust for Daylight Savings Time	Adjusts the time if the zone you selected is experiencing daylight saving. This field works only if you selected the Automatically adjust clock for daylight saving changes check box located on the Time Zone tab of the Date/Time Properties dialog box in the Control Panel.

### Historical Mode

Allows you to determine how iFIX selects and fetches data from a historical data source and, determines what each displayed value represents. The options are:

- Sample - The last valid value found, up to and including the start of the specified interval.
- Avg - The average of all valid data found during the specified interval.
- High - The highest valid data point value found during the specified interval.
- Low - The lowest valid data point value found during the specified interval.
- Interpolated - The data is interpreted by assuming new data points between the starting and ending values. All data points are estimated except the starting point and the ending point.
- Current Value - The current value of the data point.

**IMPORTANT:** The Current Value may update at a rate different from the rate set in the Update Rate field. The update rate is not set solely by the rate entered in the Update Rate field. It also depends on the collection rate, the rate for querying Historian, and the time required to request an update from the Historian server and send it back to the client. As a result, the time it takes to display the updates may be longer than anticipated. Additionally, please be aware that the timestamp for this mode represents the timestamp from the Historian server, not the client.

- Standard Deviation - The standard deviation of all valid data found during the specified interval.
- Total - The total of all valid data found during the specified interval.

#### **Duration**

The duration determines the time range for the historical data source. The minimum duration for a fetch is one second; the maximum is 999 days, 23 hours, 59 minutes, and 59 seconds.

Item	Description
Days	Allows you to enter the number of days. This field can be used in conjunction with the other fields in this area.
Hours	Allows you to enter the number of hours for the duration for the data fetch query. This field can be used in conjunction with the other fields in this area.
Mins	Allows you to enter the number of minutes for the duration for the data fetch query. This field can be used in conjunction with the other fields in this area.
Secs	Allows you to enter the number of seconds for the duration for the data fetch query. This field can be used in conjunction with the other fields in this area.

#### **Update Rate**

Allows you to specify the rate at which the data is updated. The default rate is five seconds. Zero is permitted for a one-time fetch. The fastest update rate is five seconds, the slowest, 1:59:59.

Item	Description
Hours	Allows you to enter the number of hours for the rate of data update. This field can be used in conjunction with the other fields in this area.
Mins	Allows you to enter the number of minutes for the rate of data update. This field can be used in conjunction with the other fields in this area.
Secs	Allows you to enter the number of seconds for the rate of data update. This field can be used in conjunction with the other fields in this area.

### **Picture Tab - Advanced Animations Dialog Box**

The Picture tab of the Advanced Animations dialog box displays the following items:

#### **Properties**

Provides options that allow you to select the properties that you want to animate. For a brief description of each property, read the property description on the right side of the dialog box.

#### **Animate**

Select this check box to open dynamic settings for the visible property. When selected, the Dynamic Setting for Property area appears directly below the Properties area.

#### **Dynamic Settings for Property**

#### **Data Source**

Allows you to enter a data source or expression for this object.

*Data source* refers to a reference to a source of information, such as iFIX tagnames and historical files, or other OPC-compliant data servers. A data source may also consist of iFIX objects (such as shapes, charts, and variables) or 3rd party OLE controls.

*Expression* refers to constants, data sources, or a combination of constants and data sources that are connected with one or more operators. Use the Browse (...) button to open the Expression Builder dialog box. Use the Quick Modify button to modify a database block directly without launching the Database Manager.

#### Animation Properties Tab

The Animation Properties tab contains the following items:

Item	Description
Data Conversion	<p>Allows you to select the type of data conversion to apply to the data from the source listed in the Data Source field. A data conversion defines how the incoming data should be processed or formatted so that your objects behave according to the properties you have assigned to them. You can apply any of the following data conversion:</p> <ul style="list-style-type: none"><li>• <b>Range</b> - uses a range of values on which to animate an object.</li><li>• <b>Table</b> - attempts to match the incoming value from the data source to an entry in a lookup table. If a match occurs, the selected property is changed to match the output value.</li><li>• <b>Format</b> - provides several options for formatting text data.</li><li>• <b>Object</b> - processes the data received from the data source at its exact value. This option is not supported for data from GE Historian.</li></ul> <p><b>NOTE:</b> If you change the Data Conversion option from Table to Range, Format, or Object, the bottom half the dialog box changes accordingly.</p>
Output Error Mode	<p>Allows you to configure how an animation behaves if an error occurs. Depending on the type of data conversion, the output error mode can be any of the following:</p> <ul style="list-style-type: none"><li>• <b>Use Current Output</b> - Displays the data exactly as it appeared in when the error occurred.</li><li>• <b>Use Error Table</b> - Displays an error message that matches the current error, based on the error definitions in the Animations Data Error Defaults tab of the User Preferences dialog box.</li><li>• <b>Use Minimum Value</b> - Displays the lowest possible value that is valid for the data source when an error occurs.</li></ul>

	<ul style="list-style-type: none"> <li><b>Use Maximum Value</b> - Displays the highest possible value that is valid for the data source when an error occurs.</li> </ul>
Exact Match	Allows you to specify that incoming data must exactly match the configured input value in the lookup table in order to format the data as the corresponding output value.
Range Comparison	Allows you to specify that incoming data must fall within a range of input values in the lookup table in order to format the data as the corresponding output value.
Insert Row	Inserts a new row into the data conversion table.
Modify Row	Displays the <a href="#">New Level Dialog Box</a> so that you can modify an existing row in the data conversion table.
Delete Row	Deletes an existing row of the data conversion table.
Advanced	Displays the <a href="#">Advanced Lookup Options Dialog Box</a> that allows you to configure several more lookup options.

#### Historical Properties Tab

The Historical Properties tab allows you to set the parameters for a query that fetches historical data from GE Historian. The tab contains the following items:

**NOTE:** The following fields, with the exception of the Update Rate fields, are only available if you select a Historical Mode other than Current Value.

##### Start Date

Item	Description
Fixed Date	Specifies whether to enter a specific start date for the query of the data source.
Days Before Now	Specifies whether to enter the number of days prior to today to fetch data from GE Historian. For example, if you want to display data collected for the data source two days ago, enter 2.

##### Start Time

Item	Description
Fixed Time	Specifies whether to designate a specific time to start. If selected, allows you to enter an explicit start time.
Lock Time	Locks the Fixed Time, even if you change the time zone in the Date and Time Properties dialog box in the Control Panel. This field is available only when you designate a specific time to start using the Fixed Time field.
Duration Before Now	Specifies whether to enter the duration prior to the current time to start. The minimum duration is 0 seconds; the maximum is 23 hours, 59 minutes, and 59 seconds.

##### Time Zone

Item	Description

Time Zone	Allows you to select the time zone to associate with the start time. You can select the client time (time zone for your computer), the server time (time zone used by the Historian server), or the tag time (uses the time zone bias of the tag, which is set in Historian). The default time zone is that of the client machine. This field is available only when Historian is used.
Adjust for Daylight Savings Time	Adjusts the time if the zone you selected is experiencing daylight saving. This field works only if you selected the Automatically adjust clock for daylight saving changes check box located on the Time Zone tab of the Date/Time Properties dialog box in the Control Panel.

#### Historical Mode

Allows you to determine how iFIX selects and fetches data from a historical data source and, determines what each displayed value represents. The options are:

- Sample - The last valid value found, up to and including the start of the specified interval.
- Avg - The average of all valid data found during the specified interval.
- High - The highest valid data point value found during the specified interval.
- Low - The lowest valid data point value found during the specified interval.
- Interpolated - The data is interpreted by assuming that the line between two values is a straight line. All points along that line are estimated except the starting point and the ending point.
- Current Value - The current value of the data point.

**IMPORTANT:** The Current Value may update at a rate different from the rate set in the Update Rate field. The update rate is not set solely by the rate entered in the Update Rate field. It also depends on the collection rate, the rate for querying Historian, and the time required to request an update from the Historian server and send it back to the client. As a result, the time it takes to display the updates may be longer than anticipated. Additionally, please be aware that the timestamp for this mode represents the timestamp from the Historian server, not the client.

- Standard Deviation - The standard deviation of all valid data found during the specified interval.
- Total - The total of all valid data found during the specified interval.

#### Duration

The duration determines the time range for the historical data source. The minimum duration for a fetch is one second; the maximum is 999 days, 23 hours, 59 minutes, and 59 seconds.

Item	Description
Days	Allows you to enter the number of days. This field can be used in conjunction with the other fields in this area.
Hours	Allows you to enter the number of hours for the duration for the data fetch query. This field can be used in conjunction with the other fields in this area.
Mins	Allows you to enter the number of minutes for the duration for the data fetch query. This field can be used in conjunction with the other fields in this area.
Secs	Allows you to enter the number of seconds for the duration for the data fetch query. This field can be used in conjunction with the

other fields in this area.

#### Update Rate

Allows you to specify the rate at which the data is updated. The default rate is five seconds. Zero is permitted for a one-time fetch. The fastest update rate is five seconds, the slowest, 1:59:59.

Item	Description
Hours	Allows you to enter the number of hours for the rate of data update. This field can be used in conjunction with the other fields in this area.
Mins	Allows you to enter the number of minutes for the rate of data update. This field can be used in conjunction with the other fields in this area.
Secs	Allows you to enter the number of seconds for the rate of data update. This field can be used in conjunction with the other fields in this area.

### Advanced Lookup Options Dialog Box

The Advanced Lookup Options dialog box displays the following items:

#### Toggle Source

Allows you to enter a data source or expression to provide an additional animation to an object.

#### Toggle Value

Allows you to specify a second output color to which you want to convert the input value or range of values in the lookup table, based on the value of the data source in the Toggle Source field.

#### Table

Allows you to override the default lookup table completely and use a user-defined lookup table that is defined in the User Global page.

#### Toggle Rate

Allows you to modify the blink rate of the animations that are tied to the selected object, if you have specified a second data source through the Toggle Source field.

#### Unmatched Level

Allows you to specify the color value for the data if the conversion does not match a level that is defined in the lookup table.

#### Tolerance for Exact Match Table

Allows you to specify the allowable deviation from the exact match table. For example, if the exact match table has a configured level of 20, and you enter a tolerance of .1, then the conversion will proceed even with a value of 19.9.

### Alarm Summary Configuration Dialog Box

Click the following links for more information about the Alarm Summary Configuration dialog box:

- [General Tab](#)
- [Operator Tab](#)
- [Filter Tab](#)
- [Sort Tab](#)
- [Color Tab](#)
- [Column Tab](#)
- [Display Tab](#)

### **General Tab - Alarm Summary Configuration Dialog Box**

The General tab of the Alarm Summary Configuration dialog box contains the following item:

#### **Description**

Allows you to enter a description for the Alarm Summary object.

#### **Alarm Summary Column Headers**

Displays the font selected for the column headings in the Alarm Summary object. Only the font name appears in this field. Click the browse (...) button to change the font name, style, size, or script.

After you select a new font and click Apply or OK, the font gets applied to the Alarm Summary object - in both configure and run mode. If the font is larger than the area allowed, the height of the area is adjusted.

#### **Browse (...) Button 1**

Click to select a font name, style, size, and script for the column headings in the Alarm Summary object.

#### **Status Bar**

Displays the font selected for the status bar in the Alarm Summary object. Only the font name appears in this field. Click the browse (...) button to change the font name, style, size, or script.

After you select a new font and click Apply or OK, the font gets applied to the Alarm Summary object - in both configure and run mode. If the font is larger than the area allowed, the height of the area is adjusted.

#### **Browse (...) Button 2**

Click to select a font name, style, size, and script for the text in the status bar of the Alarm Summary object.

### **Operator Tab - Alarm Summary Configuration Dialog Box**

The Operator tab of the Alarm Summary Configuration dialog box displays the following items:

#### **Operator Run Time Settings**

Item	Description
Allow Alarm Acknowledgement	When selected, allows operators to acknowledge alarms through the Alarm Summary object at run-time. The operator can right-click the object and acknowledge the currently selected alarm, all of the

	alarms that match the current filter, or all of the alarms that are currently displayed on the screen.
Allow Alarm Deletion	When selected, allows operators to delete alarms through the Alarm Summary object at run-time. The operator can right-click the object and delete the currently selected alarm or all of the alarms that match the current filter.
Allow Run Time Configuration	When selected, allows operators to change the filter and sort configuration of the Alarm Summary object at run-time.
Enable Column Quick Sort	When selected, allows operators to click the heading of any of the Alarm Summary object's columns to sort alarms by the attribute listed in that column.
Display Right Mouse Menu	When selected, allows operators to right-click the Alarm Summary object and select from a list of related commands.
Allow Acknowledge All Alarms	<p>When selected, this feature allows operators to acknowledge all alarms for the Alarm Summary object. By default this option is enabled.</p> <p><b>IMPORTANT:</b> The iFIX Electronic Signature option does not support Acknowledge All Alarms capability. If you are operating in a regulated environment, GE encourages you to clear the Allow Acknowledge All Alarms check box.</p>

## Filter Tab - Alarm Summary Configuration Dialog Box

The Filter tab of the Alarm Summary Configuration dialog box displays the following items:

### Column List Box

Allows you to choose the column of the Alarm Summary object that you want to add a filter condition to. To add the filter condition, select the column name from this list and click the Add Filter Condition button or Insert Filter Condition button. Note that the Insert Filter Condition button is available only if you have a previously defined filter condition.

### Add Filter Condition

Allows you to add a filter condition to the Alarm Summary object's column that is selected in the Columns field. Select a field and click Add Filter Condition to open the associated dialog box:

- [Add Ack Dialog Box](#)
- [Add Area Dialog Box](#)
- [Add Date In Dialog Box](#)
- [Add Date Last Dialog Box](#)
- [Add Description Dialog Box](#)
- [Add Node Dialog Box](#)
- [Add Priority Dialog Box](#)
- [Add Tag Dialog Box](#)
- [Add Time In Dialog Box](#)

- [Add Time Last Dialog Box](#)
- [Add Alarm Extension Field1 Dialog Box](#)
- [Add Alarm Extension Field2 Dialog Box](#)

When you add the filter condition, it appears at the end of the Display Alarms Where list. The Alarm Summary object supports up to nine filter conditions.

#### **Insert Filter Condition**

Allows you to add a filter condition to the Alarm Summary object's column that is selected in the Columns field. Select a field and click Insert Filter Condition to open the associated dialog box:

- [Add Area Dialog Box](#)
- [Add Date In Dialog Box](#)
- [Add Date Last Dialog Box](#)
- [Add Description Dialog Box](#)
- [Add Node Dialog Box](#)
- [Add Priority Dialog Box](#)
- [Add Tag Dialog Box](#)
- [Add Time In Dialog Box](#)
- [Add Time Last Dialog Box](#)
- [Add Alarm Extension Field1 Dialog Box](#)
- [Add Alarm Extension Field2 Dialog Box](#)

When it is inserted, the filter condition appears before the currently-selected filter condition in the Display Alarms Where list. The Alarm Summary object supports up to nine filter conditions.

#### **Display Alarms Where... List Box**

Lists all configured filter conditions. You can modify, delete, or add relational and comparison operations to these filter conditions by clicking the buttons on the right.

#### **Additional Buttons**

The following buttons are included next to the Display Alarms list box:

Item	Description
Modify	Opens the <a href="#">Modify Area Dialog Box</a> . This dialog box allows you to edit the filter condition that is currently selected in the Display Alarms Where list.
Remove	Allows you to delete the filter condition that is currently selected in the Display Alarms Where list.
And	Use this button to logically connect two expressions that must both be true.
Or	Use this button to logically connect two expressions where only one of the conditions in the expression can be true.
(	Use this button to logically group two or more expressions. This button

	must be used in conjunction with the ) operator.
)	Use this button to logically group two or more expressions. This button must be used in conjunction with the ( operator.
Not	Use this button to logically negate expressions.

## Sort Tab - Alarm Summary Configuration Dialog Box

The Sort tab of the Alarm Summary Configuration dialog box displays the following items:

### Sort By

Allows you to select the attribute (column) of the Alarm Summary object you want to sort by.

### Ascending

Sorts the rows of the Alarm Summary object's spreadsheet in the ascending order of the attribute that is currently displayed in the Sort By field.

### Descending

Sorts the rows of the Alarm Summary object's spreadsheet in the descending order of the attribute that is currently displayed in the Sort By field.

## Color Tab - Alarm Summary Configuration Dialog Box

The Color tab of the Alarm Summary Configuration dialog box displays the following items:

### Foreground Alarm Color

Item	Description
Color By Status	Select this option to color the text and font of alarms using the alarm status.
Color By Priority	Select this option to color the text and font of alarms using the alarm priority.
Unacknowledged Alarm Color	Select this check box to display all unacknowledged alarms in the Alarm Summary object with the selected color. This check box overrides all entries listed in the Foreground Alarm Color grid.
Foreground Alarm Color grid	Allows you to modify the foreground color and attributes for the alarms displayed in the Alarm Summary object.

### Background Alarm Color

Item	Description
Color By Priority	Select this option to color the background of alarms using the alarm priority.
Color By Status	Select this option to color the background of alarms using the alarm status.
Blink to Color	Select this check box to define a blink color for the background. You set the color for the blink in the Background Color grid, in the second column.

Background Color grid	Allows you to modify the background color for the alarm. The first column is the background color, while the second column (if Blink to Color is enabled) is the blink color for the background.
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#### Run Status Color - Blink

Specifies whether the Alarm Summary object's run indicator blinks while the spreadsheet is not paused.

#### Pause Status Color - Blink

Specifies whether the Alarm Summary object's pause indicator blinks while the spreadsheet is paused.

#### Paused Alarm Status Color - Blink

Specifies whether the Alarm Summary object's pause indicator blinks when new alarms are received while the spreadsheet is paused.

### Column Tab - Alarm Summary Configuration Dialog Box

The Column tab of the Alarm Summary Configuration dialog box displays the following items:

#### Columns Area

Item	Description
Available Columns	Lists the columns that are available to be added to the Alarm Summary object. To add a column, select the column name and click Add. The name of the column appears in the Selected Columns list, and appears in the Alarm Summary object at run-time.
Add	Allows you to add the currently selected column in the Available Columns list to the Alarm Summary object.
Remove	Allows you to remove the currently selected column in the Selected Columns list from the Alarm Summary object.
Selected Columns	Lists the columns that appear in the Alarm Summary object at run-time. To remove a column from the list, select the column name and click Remove. To change the order of the columns, select the column name and use the up and down arrows to move the column to the desired position.
Up	Moves the selected column name up in the Selected Columns list. This has the effect of moving the column to the left in the Alarm Summary object at run-time.
Down	Moves the selected column name down in the Selected Columns list. This has the effect of moving the column to the right in the Alarm Summary object at run-time.

#### User Definable Columns

Item	Description
User Defined Field 1	Allows you to assign a different ASCII (A_) block field to the User Defined Field 1 column. The default field is A_CUALM. This field is available only if the User Defined Field1 column has been added to the Selected Columns list.

<> (first instance)	Changes the ASCII (A_) block field that is represented by the User Defined Field 1 entry in the Selected Columns list to the field currently entered in the User Defined Field.
User Defined Field 2	Allows you to assign a different ASCII (A_) block field to the User Defined Field 2 column. The default field is A_AUTO. This field is available only if the User Defined Field2 column has been added to the Selected Columns list.
<> (second instance)	Changes the ASCII (A_) block field that is represented by the User Defined Field 2 entry in the Selected Columns list to the field currently entered in the User Defined Field 2 field.
User Defined Field Name 1	Specifies the text displayed in the header of the Alarm Summary object's User Defined Field1 column. The text you specify cannot match the text of any existing column header, including the text used in the User Defined Field2 column header. The maximum length of this name is 50 characters.
User Defined Field Name 2	Specifies the text displayed in the header of the Alarm Summary object's User Defined Field2 column. The text you specify cannot match the text of any existing column header, including the text used in the User Defined Field1 column header. The maximum length of this name is 50 characters.

### Display Tab - Alarm Summary Configuration Dialog Box

The Display tab of the Alarm Summary Configuration dialog box displays the following items:

#### Display Settings

Item	Description
Show Headers	Shows/Hides the column names of the Alarm Summary object.
Show Scroll Bars	Enables/Disables horizontal and vertical scroll bars for the Alarm Summary object.
Show Row Numbers	Shows/Hides the row numbers for each row in the Alarm Summary object.
Show Status Bar	Shows/Hides the status bar of the Alarm Summary object.
Show Grid Lines	Shows/Hides the spreadsheet grid of the Alarm Summary object.
Don't Blink Alarms	When selected, the Alarm Summary object does not flash new unacknowledged alarms in run mode.
Blink Unack	When selected, the Alarm Summary object flashes new unac-

Alarms	knowned alarms at run-time. The rate at which the unacknowledged alarms flash is defined by the value in the Blink Rate field.
Reverse Colors On Unack Alarms	When selected, the Alarm Summary object reverses the colors of the unacknowledged alarms visible in the Alarm Summary object. When an alarm is acknowledged, the colors revert to their configured state.
Reverse Colors On Ack Alarms	When selected, the Alarm Summary object reverses the colors of the acknowledged alarms visible in the Alarm Summary object. While an alarm is unacknowledged, the colors are as configured. When the alarm is acknowledged, the colors are reversed.
Show Current Alarm Status	Select this option to show the current alarm status in the Alarm Summary window.
Show Latched Alarm Status	Select this option to show the latched alarm status in the Alarm Summary window.

**NOTE:** Reversing colors has two different actions depending on whether the Blink To Color option is disabled or enabled. If the Blink To Color option is disabled, the text color comes from the Foreground Color table and the background color comes from the Background Color table. When the colors are reversed, the text color comes from the Background Color table and the background color comes from the Foreground color table. If the Blink To Color option is enabled, the text color comes from the Foreground Color table and the background color comes from the Background Color table. When the colors are reversed, the text color still comes from the Foreground Color table and the background color comes from the Blink Color table.

#### Refresh Settings

Item	Description
Alarm Refresh Interval	Allows you to configure how often the Alarm Summary object examines the queue for new alarms at run-time.
Data Refresh Interval	Allows you to configure how often the Alarm Summary object updates the alarm values currently displayed at run-time.
Blink Rate	If the Blink Unack Alarms option is selected, allows you to configure how often an unacknowledged alarm flashes at run-time. The Blink Rate ranges from 1 to 10 seconds. By default, it is 1 second.
Selection Timeout	Allows you to configure how long a row in the spreadsheet remains selected at run-time.

## Basic Animation Dialog Box

The Basic Animation dialog box displays the following items:

#### General

Item	Description
Object Name	Allows you to enter a name for the selected object. The name that you specify appears in the WorkSpace system tree and in the

	Name row of the VBA Property window.
Description	Allows you to enter a description for the selected object. The description that you specify appears in the ToolTip for the object (provided that the Enable ToolTips option is enabled) and in the Description row of the VBA Property window.
Enable Tooltip	Select this option to display an on-screen description of the object when the pointer pauses on it. You can only use this in conjunction with the Enable Highlight option.
Tooltip Option	This drop-down list is only available when the Enable Tooltip option is selected. Select the item from the list that specifies where the tooltip text comes from: <ul style="list-style-type: none"> <li>• The object's Description property (TooltipDescription).</li> <li>• The Dynamo's Description property (TooltipDynamoDescription).</li> <li>• From a run mode tag value description supplied when you load tag status symbols for your picture (TooltipTagStatus).</li> </ul>
Enable Highlight	Select this option to display a highlight around the object when the pointer is on it. To use the ToolTip option, you must also select this option.
Enable Select	Select this check box to allow operators to select the object at run-time.

## Color

Item	Description
Foreground Check Box	Select this option to animate the foreground color property of the selected object. If this check box is selected, a Foreground Color property animation already exists for this object.  To modify the existing animation, click the Foreground Color Expert button. To remove the Foreground Color animation, clear the check box.  <b>NOTE:</b> Lines, polylines, and bitmaps do not have foreground color properties.
Foreground Button	Click this button to animate the foreground color property of the selected object. If the Foreground check box is selected, click this button to modify the existing foreground color animation.  <b>NOTE:</b> Lines, polylines, and bitmaps do not have foreground color properties.
Edge Check Box	Select this option to animate the edge color property of the selected object. If this check box is selected, an Edge Color property animation already exists for this object.  To modify the existing animation, click the Edge Color Expert button. To remove the Edge Color animation, clear the check box.

Edge Button	Click this button to animate the edge color property of the selected object. If the Edge check box is selected, click this button to modify the existing edge color animation.
Background Check Box	Select this option to animate the background color property of the selected object. If this check box is selected, a Background Color property animation already exists for this object.  To modify the existing animation, click the Background Color Expert button. To remove the Background Color animation, clear the check box.
Background Button	Click this button to animate the background color property of the selected object. If the Background check box is selected, click this button to modify the existing background color animation.

## Movement

Item	Description
Position Check Box	Select this option to animate the Horizontal or Vertical Position property of the selected object.  If this check box is selected, a Position property animation already exists for this object.  To modify the existing animation, click the Position Expert button. To remove the Horizontal or Vertical Position animation, clear the check box.
Position Button	Click this button to animate the Horizontal or Vertical Position property of the selected object.  If the Position check box is selected, click this button to modify the existing Position animation.
Scale Check Box	Select this option to animate the Uniform Height and Width Scale property of the selected object. These animations allow you to scale the object proportionally, by height, or by width.  If the Scale check box is selected, a Scale property animation already exists for this object.  To modify the existing animation, click the Scale Expert button. To remove the Scale animation, clear the check box.
Scale Button	Click this button to animate the Uniform Height and Width Scale property of the selected object. These animations allow you to scale the object proportionally, by height, or by width.  If the Scale check box is selected, click this button to modify the existing Scale animation.
Rotate Check Box	Select this option to animate the RotationAngle property of the selected object. This animation allows you to define the angle of rotation. If the Rotation check box is selected, a RotationAngle property animation already exists for this object.

	<p>To modify the existing animation, click the Rotation Expert button. To remove the RotationAngle animation, clear the check box.</p> <p><b>NOTE:</b> Ovals, rounded rectangles, and charts do not have rotation properties.</p>
Rotate Button	<p>Click this button to animate the RotationAngle property of the selected object. This animation allows you to define the amount to rotate an object. If the RotationAngle check box is selected, click this button to modify the existing RotationAngle animation.</p> <p><b>NOTE:</b> Ovals, rounded rectangles, and charts do not have rotation properties.</p>

## Fill

Item	Description
Fill Percentage Check Box	<p>Select this option to animate the Fill property of the selected object. You can animate both the Horizontal and Vertical Fill properties and specify whether the Fill animates based on a percentage.</p> <p>If the Fill check box is selected, a Fill property animation already exists for this object. To modify the existing animation, click the Fill Expert button. To remove the Fill animation, clear the check box.</p>
Fill Percentage Button	<p>Click this button to animate the Fill property of the selected object. You can animate both the Horizontal and Vertical Fill properties and specify whether the Fill animates based on a percentage. If the Fill check box is selected, click this button to modify the existing Fill animation.</p>

## Visibility

Item	Description
Visible Check Box	<p>Select this option to animate the Visible property of the selected object. This animation allows you to make an object visible or invisible. If the Visibility check box is selected, a Visible property animation already exists for this object.</p> <p>To modify the existing animation, click the Visibility Expert button. To remove the Visibility animation, clear the check box.</p>
Visible Button	<p>Click this button to animate the Visible property of the selected object. This animation allows you to make an object visible or invisible. If the Visibility check box is selected, click this button to modify the existing Visibility animation.</p>

## Additional Animations

Item	Description
Advanced Animations	Select this option to open the Advanced Animations dialog box.

Check Box	<p>This dialog box allows you to access all of the property animations available to the selected object and also provides a more detailed interface for adding or modifying property animations.</p> <p>If this check box is selected, one or more advanced animations already exist for this object.</p> <p>To modify the existing animations, click the Configure button. To delete the existing Advanced Animations, clear this check box.</p>
Configure	<p>Click this button to open the Advanced Animations dialog box. This dialog box allows you to access all of the property animations available to the selected object and also provides a more detailed interface for adding or modifying property animations.</p> <p>If the Advanced Animations check box is selected, one or more advanced animations already exist for this object.</p> <p>To modify the existing animations, click the Configure button. To delete the existing Advanced Animations, clear this check box.</p>

## Command

Item	Description
Click Check Box	<p>Select this option to specify one or more click commands for your object. If this check box is selected, a command script already exists for this object.</p> <p>To modify the existing command script, click the Click button to launch the Multiple Command Script Wizard. To delete the existing script, clear this check box.</p>
Click Button	<p>Click this button to specify one or more click commands for your object. If the Click check box is selected, click this button to modify the script in the Multiple Command Script Wizard.</p>

## Button Caption Converter Dialog Box

The Button Caption Converter Dialog Box allows you to select one or more button captions (text) on your active picture and converts the button caption text to scale to a new screen resolution.

### Convert Button Caption

Converts the selected button(s) in the 'Push button found on picture' dialog box.

### Find Next

Allows you to confirm the conversion of each button individually.

### Convert all

Converts all the selected button text.

## **Close**

Closes the Button Caption Converter dialog box.

## **Push buttons found on picture**

Lists all the buttons in the active picture that are available for conversion.

NOTE: When the button includes only a bitmap, it is not listed for conversion as there is no caption to convert.

## **Chart Customization Dialog Box**

The Chart Customization dialog box is composed of the following tabs:

- [General Tab](#)
- [Chart Tab](#)

### **General Tab - Chart Customization Dialog Box**

The General tab of the Chart Customization dialog box displays the following items:

#### **Name**

Allows you to enter a specific name for your chart.

#### **Description**

Allows you to add a description for your chart.

#### **Help Context ID**

Allows you to attribute a help context ID for your own help files.

#### **Highlightable**

Allows you to highlight the chart at run time.

#### **Selectable**

Allows you to select the chart at run time.

#### **Modifiable**

Allows you to modify the chart at run time.

#### **Scroll Direction**

Item	Description
Scroll Right to Left	Specifies that when you scroll the chart, it will do so from right to left.
Scroll Left to Right	Specifies that when you scroll the chart, it will do so from left to right.
Reset	Allows you to assign a reset value for a left-to-right scroll. The data and its time shifts according to this percentage when the data plot reaches the right edge of the chart.

## Apearance

Item	Description
Refresh Rate	Allows you to specify how quickly a chart updates the data plot at run time.
Historical Update Rate	Allows you to specify the rate at which the historical chart is updated. The default rate of zero disables the chart from being automatically updated. The rate format is hh:mm:ss. The rate limit is one hour.
Transparent	Makes the chart transparent.
Foreground Color	To change the foreground color, click this button to open the Select Color dialog box.
Background Color	To change the background color, click this button to open the Select Color Dialog box.
Show Multiple Values	Allows you to display all of the chart pen's axes at run time.
Show Multiple Times	Allows you to display all of the chart pen's time scales at run time.
Show Time Cursor	Allows you to display all of the chart pen's time cursors at run time.
Show Time Cursor Tool Tips	Allows you to display the pens' time cursor ToolTips at run time.

## Zooming

Item	Description
Horizontal	Allows you to zoom into a chart on its horizontal axis at run time.
Vertical	Allows you to zoom into a chart on its vertical axis at run time.
Both	Allows you to zoom into a chart on both its horizontal and vertical axes at run time.

## Chart Tab - Chart Customization Dialog Box

The Chart tab of the Chart Customization dialog box displays the following items:

### Data Sources

Allows you to add a pen to your chart by double-clicking a blank field in the list. This in turn allows you to select a data source for the pen.

### Apply to All Pens

Allows you to apply any properties that you select from this dialog box to all pens in a chart.

### Pen Tab

Item	Description
High Limit	Allows you to enter the high limit value defined for the selected data source.
Low Limit	Allows you to enter the low limit value defined for the selected data

	source.
Number of Decimal Places to Display	Allows you to specify the number of decimal places the pen displays for EGU limits. Enter a number from 0-7.
Fetch Limits	Specifies whether or not to automatically retrieve the low and high limits assigned to the selected data source at run time.
Show Line	Specifies whether or not to display the trend line for the selected data source.
Constant Line	Specifies whether or not to display a constant horizontal line at the current value of the pen.
Show Gaps	Specifies whether or not to display a blank space to represent an area in a plot where there is no data.
Use Regional Settings	Specifies whether or not to use the Windows Regional Settings. Disabling this feature allows you to enter user-defined decimal place settings. By default, this feature is enabled.
Maximum Display Points	Allows you to specify how many data points will be displayed in the chart over a given span duration.
Line Style	<p>Allows you to apply a style to the pen's plot line. The options are:</p> <ul style="list-style-type: none"> <li><b>Solid</b> - Applies a solid pen line style.</li> <li><b>Dash</b> - Applies a dashed pen line style.</li> <li><b>Dot</b> - Applies a dotted pen line style.</li> <li><b>DashDot</b> - Applies a dash-dot combination line style.</li> <li><b>DashDotDot</b> - Applies a dash-dot-dot combination line style.</li> </ul>
Line Color	Allows you to specify the color of the pen's plot line.
Line Width	Allows you to specify the width of a pen's plot line.
Marker Style	Allows you to specify a style for the pen's marker type.
Historical Mode	<p>Allows you to determine how iFIX selects data from a historical data source and displays it in the chart, and determines what each displayed value represents. The options are:</p> <ul style="list-style-type: none"> <li><b>Sample</b> - The last valid value found is trended, up to and including the start of the interval.</li> <li><b>Avg</b> - The average of all valid data found during the interval is trended, starting at the beginning of the interval, 12:00:00. In this case, 4.5 is trended from 12:00:00 to 12:10:00.</li> <li><b>High</b> - The highest valid data point value found during the interval is trended, starting at the beginning of the interval, 12:00:00. In this case, 9.0 is trended from 12:00:00 to 12:10:00.</li> <li><b>Low</b> - The lowest valid data point value found during the interval is trended, starting at the beginning of the interval, 12:00:00. In this case, 0.0 is trended from 12:00:00 to 12:10:00.]</li> <li><b>Interpolated</b> - The data is interpreted by assuming that the line between two values is a straight line. All points along that line are</li> </ul>

	estimated except the starting point and the ending point. Available for Historian only.
Type	This field is informational. You cannot edit this field.

#### Time Tab

Item	Description
Fixed Date	Specifies whether or not to enter a specific date on which to start the display, in the format MM/DD/YY (month/day/year).
Days Before Now	Specifies whether or not to enter a number of days prior to today to start the display. Allows you to enter the number of days prior to today to start the display. For example, if you want to define a time group to display data collected two days before the current date, enter 2.
Fixed Time	Specifies whether or not to designate a specific time to start the display, based on a 24 hour clock.
Lock Time	Locks the current Fixed Time, even if you change the time zone in the Date and Time Properties dialog box in the Control Panel. This field is available only when you designate a specific time to start the display using the Fixed Time field.
Duration Before Now	Specifies whether or not to enter the duration prior to the current time to start the display. The minimum duration for a display is 0 seconds; the maximum is 23 hours, 59 minutes, and 59 seconds.
Time Zone	Allows you to select the time zone to associate with the start time. You can select a specific time zone, or you can select the client time (time zone for your computer), the server time (time zone used by the Historian server), or the collector time (time zone of the collector machine). The default time zone is that of the client machine. This field is available only when Historian is being used.
Adjust for Daylight Saving Time	Adjusts the time if the zone you selected is experiencing daylight saving. This field works only if you selected the Automatically adjust clock for daylight saving changes check box located on the Time Zone tab of the Date/Time Properties dialog box in the Control Panel. This field is available only when Historian is being used.
Days	Allows you to enter the duration for the display, which determines how much data to display on the x axis. The minimum duration for a display is 1 second; the maximum is 99 days, 23 hours, 59 minutes, and 59 seconds.
Time	Displays the time.
Display Milliseconds	Displays milliseconds on the time axis and time cursor in the chart and milliseconds in the (Interval) Time field when Historian is being used. This field is available only when Historian is being used.

#### X-Axis Tab

Item	Description
Show X Axis	Specifies whether or not to display the x axis in the chart.
Number of Labels	Allows you to specify how many labels the x axis will contain. You can

	enter a maximum of 21 labels.
Number of Ticks	Allows you to specify how many ticks the x axis will contain. You can enter a maximum of 21 ticks.
Axis Color	Allows you to choose a color for the axis.
Show Date	Allows you to display the current date in the x axis of the chart.
Allow Reset of Axis Limits	Lets you control changes to the limits on the x (time) axis in a chart. Initially, the limits are set to match the time specified on the Time tab of the Chart Customization dialog box. However, when you select this check box, you enable the time axis limits of your chart to be reset after you right-click the object to zoom out. The chart resets the time axis limits to the values of the Start Time and End properties.
Show Title	Specifies whether or not to display the title of the x axis in the chart.
Title	Allows you to specify a title for the x axis in the chart. You can enter a title of up to 255 characters.

#### Y-Axis Tab

Item	Description
Show Y Axis	Specifies whether or not to display the y axis in the chart.
Number of Labels	Allows you to specify how many labels the y axis will contain. You can enter a maximum of 21 labels.
Number of Ticks	Allows you to specify how many ticks the x axis will contain. You can enter a maximum of 21 ticks.
Axis Color	Allows you to choose a color for the axis.
Allow Reset of Axis Limits	Lets you control changes to the limit on the y (value) axis in a chart. Initially, the limits are set to match the High and Low limits specified on the Pen tab of the Chart Customization dialog box. However, when you select this check box, you enable the value axis limits of your chart to be reset after you right-click the object to zoom out. The chart resets the value axis limits to the values of the HiLimit and LoLimit properties.
Show Title	Specifies whether or not to display the title of the x axis in the chart.
Title	Allows you to specify a title for the x axis in the chart. You can enter a title of up to 255 characters.

#### Grid Tab

Item	Description
Show Horizontal Grid	Specifies whether or not to display the horizontal grid in a chart.
Number of Lines (Horizontal)	Allows you to specify the number of lines in the horizontal grid. The maximum number of lines you can have in your grid is 21.
Grid Color (Horizontal)	Allows you to specify a color for the grid.
Grid Style (Horizontal)	Allows you to apply a style to the chart's horizontal grid line. The options are the same as for the chart's line styles.
Scroll Grid (Horizontal)	Specifies whether or not to scroll the grid.

zontal)	
Show Vertical Grid	Specifies whether or not to display the vertical grid in a chart.
Number of Lines (Vertical)	Allows you to specify the number of lines in the vertical grid. The maximum number of lines you can have in your grid is 21.
Grid Color (Vertical)	Allows you to specify a color for the grid.
Grid Style (Vertical)	Allows you to apply a style to the chart's vertical grid line. The options are the same as for the chart's line styles.

#### Legend Tab

Item	Description
Source	Specifies whether or not to display a data source in the legend.
Description	Specifies whether or not to display a description in the legend.
Value	Allows you to enter the number of characters that represents the length of the value.
Units	Specifies whether or not to display data units in the legend.
Mode	Specifies whether or not to display a data mode in the legend.
High Limit	Specifies whether or not to display a data high limit value in the legend.
Low Limit	Specifies whether or not to display a data low limit value in the legend.
Interval	Specifies whether or not to display a data interval in the legend.
High Over Range	Specifies whether or not to display the high data value of a pen in a specified time range.
Low Over Range	Specifies whether or not to display the low data value of a pen in a specified time range.
Average Over Range	Specifies whether or not to display the average data value of a pen in a specified time range.
Order	Allows you to display the items you select in any order in the legend (left to right). To rearrange the order in the list, select the item and click the Up or Down arrow.

## Color Selection Dialog Box

The Color Selection dialog box displays the following items:

### Property

Displays the color property (foreground, background, or edge) for which you are currently defining a color.

### Color Set

Lists all color sets that are currently configured on your system. You can add your own color set by clicking the New Color Set button, naming the color set, and customizing the individual colors within the set.

### **Color Tab**

Allows you to attribute a color for the selected object. To change an object's color, click the Color tab, select a color from the color box, and click OK. Optionally, you can attribute a named color by clicking the Name tab, selecting the name of a color from the list, and clicking OK.

### **Name Tab**

Displays the named colors of the color set listed in the Color Set list. To change the name of a color, double-click it from the list and enter a new name in the highlighted field.

### **Customize Color**

Allows you to create a unique color from one of the available color sets listed in the ColorSet list.

**NOTE:** This button is disabled if the System Default color set is selected.

### **New Color Set**

Allows you to add a custom color set to the ColorSet list. This button displays the [Add ColorSet dialog box](#).

## **Create Picture Wizard Dialog Box**

### **Common Wizard Elements**

The Create Picture Wizard guides you when creating pictures in Configure mode that will appear the way you intend in Run mode. Each page in the Wizard includes the following elements:

- **Preview Pane** - Shows a picture configuration based on the currently selected options.
- **Help Button** - Launches the Help topics for the Create Picture Wizard.
- **Cancel Button** - Exits the Create Picture Wizard without creating any new pictures, and without changing WorkSpace appearance.
- **Previous Button** - Returns you to the previous page in the Wizard.
- **Next Button** - Sends you to the following page in the Wizard.
- **Finish Button** - Creates the new pictures that you have specified, and sets the WorkSpace appearance that you have specified. This button is only enabled when the Wizard has collected enough information to successfully create new pictures.

### **Create Picture Paths**

The Create Picture Wizard dialog box displays three paths to create new pictures. For more information on the screens that appear when you select a path, refer the following sections:

- [Create Picture\(s\) from a Predefined Configuration](#)
- [Create a Custom Picture](#)
- [Create a Default Untitled Picture](#)

### **Show WorkSpace Appearance Page**

Indicates whether you want to view the WorkSpace Appearance page in the wizard. This page only needs to be accessed once per WorkSpace session.

## **Do not show this Wizard from the new picture menu and Exit now**

Prevents the wizard from running the next time you select New Picture from the File menu. The Finish Button changes to an OK button, and allows you to close the wizard.

## **Create Picture(s) from a Predefined Configuration**

When you select the Create Picture(s) from a Predefined Configuration option in the first screen of the Create Picture Wizard, the wizard then displays the following screens:

### **WorkSpace Appearance Screen**

This screen provides you with iFIX WorkSpace settings.

Item	Description
WorkSpace Full Screen in Run Mode	When you select this option, the WorkSpace hides its title bar, menu bar, and status bar in the run environment. If you clear this option, you can select any of the other options on the page.
Show WorkSpace Title Bar	Displays the title bar across the top of the screen in run mode.
Show WorkSpace Menu Bar	This is available only if Show WorkSpace Title Bar is enabled. Select this option to display the menu bar across the screen under the title bar in run mode.
Show Status Bar	Displays the status bar across the bottom of the screen in run mode.

### **Choose Configuration Screen**

This screen provides you with predefined picture configurations. You can select a configuration as is, or modify it through the Modify Configuration button. When you highlight a configuration name in the list box, the preview pane displays the configuration.

There are five generic names for predefined pictures: Main, Header, Footer, Left Navigation, and Faceplate. If you create a custom picture, the generic name is Custom. The background color of the generic name corresponds to the color of the picture in the preview pane.

Item	Description
Modify Configuration	Opens the <a href="#">Modify Configuration Dialog Box</a> that allows you to specify attributes and sizes for your picture.
Delete Configuration	Deletes the selected configuration from the Choose Configuration list.

### **Select Filename(s) Screen**

The Select Filename(s) page allows you to assign a filename to each picture in the configuration. Valid filenames must:

- be alphanumeric
- begin with an alphabetic character
- contain no more than 31 characters

- contain none of the following characters: spaces, @, &, \$, #, !, or %
- have a .grf extension

#### **Summary Screen**

This page summarizes the settings that will be used to create the picture.

#### **Do not show this Wizard from the new picture menu Check Box**

Prevents the wizard from running the next time you select New Picture from the File menu (Classic view) or from the WorkSpace button (Ribbon View). The Finish Button changes to an OK button, and allows you to close the wizard.

#### **Create a Custom Picture**

When you select the Create a Custom Picture option in the first screen of the Create Picture Wizard, the wizard then displays the following screens:

##### **WorkSpace Appearance Screen**

This screen provides you with iFIX WorkSpace settings.

<b>Item</b>	<b>Description</b>
WorkSpace Full Screen in Run Mode	When you select this option, the WorkSpace hides its title bar, menu bar, and status bar in the run environment. If you clear this option, you can select any of the other options on the page.
Show WorkSpace Title Bar	Displays the title bar across the top of the screen in run mode.
Show WorkSpace Menu Bar	This is available only if Show WorkSpace Title Bar is enabled. Select this option to display the menu bar across the screen under the title bar in run mode.
Show Status Bar	Displays the status bar across the bottom of the screen in run mode.

##### **Define Custom Picture Screen**

Allows you to define a picture by either specifying dimensions or using the dimensions of an existing picture. The dimensions that you enter are checked for range. The preview pane updates to show the picture that you are defining. Valid ranges for dimensions:

- For Width and Height, dimensions must be greater than zero.
- For Top and Left, dimensions can be zero or any positive or negative number.

Settings that you can configure in this area include:

<b>Item</b>	<b>Description</b>
Use Specified Dimensions	Selecting this check box allows you to specify the dimensions used to create the picture.
Left	Distance from the left of the screen to the left edge of the picture.
Top	Distance from the top of the screen to the top edge of the picture.

Width	Distance from the left edge of the picture to the right edge of the picture.
Height	Distance from the top edge of the picture to the bottom edge of the picture.
Percentage Units	Indicates the size and location of the picture is based on percentage of the screen.
Pixel Units	Indicates the size and location of the picture is based on the number of pixels.
Use Dimensions of Existing Picture	Allows you to use an existing picture as the template for a new picture.
Edit Box	Enter the picture name that you want to use the dimension of, or click the browse (...) button to select it.

#### Define Custom Picture Attributes Screen

Item	Description
Show Title Bar	Adds a title bar to your picture.
Show System Menu	Adds system menus to your picture.
Resizable	Adds sizing borders to the picture.
Always on Top	Configures the window so that it is always on top when you open it.
Allow this Picture to be Cached	Configures the window so that when it is opened and closed it is held in memory and, when reopened, is read from memory.
Background Color	Click the Background Color button to set the actual background color of the picture. This color will not appear in the preview pane, since the colors in the preview pane are used only in the Create Picture Wizard.

#### Select Filename(s) Screen

Allows you to specify the filename for the custom picture.

#### Summary Screen

This page summarizes the settings that will be used to create the picture.

#### **Do not show this Wizard from the new picture menu Check Box**

Prevents the wizard from running the next time you select New Picture from the File menu (Classic view), or from the Application Button (Ribbon View). The Finish Button changes to an OK button, and allows you to close the wizard.

#### Create a Default Untitled Picture

When you select the Create a Default Untitled Picture option in the first screen of the Create Picture Wizard, no additional screens appear. Click Finish to create your picture.

#### Custom Lookup Table Dialog Box

The Custom Lookup Table dialog box displays the following items:

#### **Source Property Type**

Allows you to specify the input data type for which you want to configure a custom lookup table. You can create a custom lookup table for the following data types: Boolean, integer, float, and string values.

#### **Object Property Type**

Allows you to specify the output data type that corresponds to the input data type specified in the Source Property Type field. You can specify the following data types as output values: Boolean, integer, float, string, and color.

#### **Exact Match**

Allows you to specify that incoming data must exactly match the configured input value in the lookup table in order to format the data as the corresponding output value.

#### **Range Comparison**

Allows you to specify that incoming data must fall within a range of input values in the lookup table in order to format the data as the corresponding output value.

#### **Grid**

Allows you to configure the lookup table for this property. Double-click any cell in the table to configure the input data, output data, and toggle (blink to) data.

#### **Insert Row**

Inserts a new row into the data conversion table.

#### **Modify Row**

Displays the [New Level Dialog Box](#) so that you can modify an existing row in the data conversion table.

#### **Delete Row**

Deletes an existing row of the data conversion table.

#### **Advanced**

Displays the [Advanced Lookup Options Dialog Box](#) that allows you to configure several more lookup options.

## **Datalink Dialog Box**

The Datalink dialog box displays the following items:

#### **Source**

Item	Description
Edit Box	Allows you to enter a data source or expression for this Data link.  Data source refers to a reference to a source of information, such as iFIX tagnames and historical files, or other OPC-compliant data servers. A data source may also consist of iFIX objects

	(such as shapes, charts, and variables) or 3rd party OLE controls. Single lettered tags named A through P are not allowed.
	Expression refers to constants, data sources, or a combination of constants and data sources that are connected with one or more operators.
Browse Button	Use the Browse (...) button to open the Expression Builder dialog box.
Quick Modify Button	Use the Quick Modify button to modify a database block directly without launching the Database Manager.

## Data Entry

Item	Description
Type	Allows you to configure whether or not operators can enter data into the Data link at run-time. To allow operators to enter data into the link and write a new value to the database tag during the next scan cycle, select In-Place from the list. To prohibit data entry at run-time, select None.
Confirm	When enabled, requires operators to confirm that they want to write data to the database after they have entered a new value in a Data link at run-time. Note that this option is only available if In-Place is selected in the Data Entry Type list.

## Output Error Mode

Allows you to specify how errors are processed for this Data link. To accept an input value and return a corresponding output value, select Use Current Output. To use values from a lookup table, select Use Error Table. If an incoming input value matches an entry in the table, that output value is returned.

For more information on different error configurations, see the Creating Pictures electronic book.

## Formatting

Item	Description
Raw Format	Allows you to enter data in its raw (or native C code) format. If this check box is enabled, you can edit the format by entering a C format string in the Format field.
Format	Allows you to enter a C format string to display data in its raw, native C code format. You can also enter a string of any kind preceding the raw format string (for example, to introduce what the data string represents).
Type	Displays when the Raw Format check box is selected.

	Displays when the Raw Format check box is cleared.
Justify	Allows you to justify the alignment of the Data link's text. Text can be aligned to the left, center, or right of the Data link.  Displays when the Raw Format check box is cleared.
Lines	Allows you to enter the number of lines that you want to display in an alpha-numerically formatted Data link.  Displays when the Raw Format check box is cleared.
Char/Lines	Allows you to enter the number of characters per line that you want to display in an alpha-numerically formatted Data link.  Displays when the Raw Format check box is cleared.

## Edit Picture Dialog Box

The Edit Picture dialog box displays the following items:

### Window Width

Specifies the width of the iFIX picture that is currently open. Window Width is measured as a percentage.

### Window Height

Specifies the height of the iFIX picture that is currently open. Window Height is measured in a percentage.

### Window Styles

Item	Description
Title Bar	Select this check box to display the title bar of the currently opened picture.
System Menu	Select this check box to display the system menu controls in the title bar of the currently opened picture. These controls allow you to perform such window-related actions as Restore, Move, Size, Minimize, Maximize, Close, and Next.
Resizable	Select this check box to indicate that the picture can be resized.
Always on Top	Select this check box to indicate that the current picture is displayed on top of all other windows.
Runtime Visible	Select this check box to indicate that the current picture can be viewed in the run-time environment.

### Gradient

Item	Description
Gradient Enabled	Select this check box to apply a gradient to the background color of the current picture.
Linear	Select this option to apply a linear gradient fade type to the background of the current picture. This option is available only when

	the Gradient enabled check box is selected.
Reflected	Select this option to apply a reflected gradient fade type to the background of the current picture. This option is available only when the Gradient enabled check box is selected.
Radial	Select this option to apply a radial gradient fade type to the background of the current picture. This option is available only when the Gradient enabled check box is selected.
Concentric	Select this option to apply a concentric gradient fade type to the background of the current picture. This option is available only when the Gradient enabled check box is selected.
Background Color	Use this button to open the Select BackgroundColor dialog box to configure the background color of the picture that is currently open.
Blend Slider	Use this slider to set the percentage of fade color to blend with the current picture's background color. The higher the percentage, the more fade color is visible. This slider is available only when the Gradient enabled check box is selected.
Fade Color	Use this button to open the Select FadeColor dialog box to configure the fade color of the picture that is currently open.
Gradient Angle Slider	Use this slider to set the angle of the gradient for the current picture's background color. This slider is available only when the Gradient enabled check box is selected.

### Message Reflection

Some messages are normally sent to the parent control. Under normal conditions, these messages are actually reflected back to the sending control, so that the control can handle its own message. This message reflection can be handled by the container, which will reflect the messages back as events. However, some controls cannot handle message reflection.

If your picture contains OLE controls, and those controls are behaving poorly, try disabling the Message Reflection check box.

### Disable Caching for this Picture

Select this check box to indicate that when you close the current picture, it will NOT be loaded into the cache. With this check box selected, the picture file will always be opened directly from the disk drive.

If you clear this check box, picture caching is enabled for the current picture, if you also enabled it in the User Preferences dialog box on the Picture tab. With picture caching enabled, iFIX reads and opens the previously opened picture from memory.

## Enhanced Chart Customization Dialog Box

The Enhanced Chart Customization dialog box is composed of the following tabs:

- [General Tab](#)
- [Data Sources Tab](#)
- [Chart Style Tab](#)

- [Subsets Tab](#)
- [Axis Tab](#)
- [Font Tab](#)
- [Color Tab](#)
- [Plotting Style Tab](#)
- [Exporting Enhanced Chart Dialog Box](#)

## General Tab - Enhanced Chart Customization Dialog Box

The General tab of the Enhanced Chart Customization dialog box displays the following items:

### **Main Title**

Allows you to enter a main title for your chart.

### **Subtitle**

Allows you to enter a subtitle for your chart.

### **Object Name**

Allows you to enter an object name for your chart. This name appears in the system tree. It must be unique and is limited to the standard object naming conventions.

### **Description**

Allows you to add a description for your chart, which is the standard object description shared by all object types.

### **Highlightable**

Allows you to highlight the chart at run time so it can be modified.

### **Selectable**

Allows you to select the chart at run time. By default, this option is selected.

### **Modifiable**

Allows you to modify the chart at run time.

### **Expandable**

Allows you to display an Expand or Contract button in the upper right corner of the chart at run time when the cursor hovers over that area. The Expand button displays the chart in full screen; the Contract button resets the chart to its original size and position. The hot keys 'E' and 'C' (upper and lower case) can also be used to Expand or Contract the chart if it has focus.

An Enhanced Chart in thumbnail mode can be expanded and contracted. [Thumbnail](#) mode can be enabled on the Chart Style tab. When expanded, the displayed chart will not be in thumbnail optimized mode, but with user configured legend settings. When contracted, it will revert back to the thumbnail settings.

## Zooming

Item	Description
Horizontal	Allows you to zoom into a chart along its horizontal axis at run time.
Vertical	Allows you to zoom into a chart along its vertical axis at run time.
Both	Allows you to zoom into a chart along both its horizontal and vertical axes at run time.

## Appearance

Item	Description
Chart Update Rate	<p>Allows you to specify how quickly a chart updates the data plot at run time. When used for real-time data, the fastest update rate is 0.1 seconds and the slowest is 1800 seconds. When used for historical data, the fastest update rate is 5 seconds and the slowest is 1800 seconds.</p> <p>This value is not used for Histogram and SPC charts. They update at the rate of their data sources.</p> <p>For XY charts, this rate specified applies to both real-time and historical data sources.</p> <p><b>NOTE:</b> If you choose to use a real-time data source for your XY or line/multiline chart, be aware that when you view it in run mode, the first data points will not be plotted until the time specified in the Chart Update Rate field has elapsed. Therefore, there will be a lag time between when you open the chart in run mode and when the data is plotted; the first data point does not immediately display. This applies to tag group substitution, as well.</p>
Historical Update Rate	<p>Allows you to specify the rate at which the historical chart is updated. The default rate of zero disables the chart from being automatically updated. The format is hh:mm:ss. The fastest update rate is five seconds, the slowest, 1800 seconds, or thirty minutes.</p> <p><b>NOTE:</b> This field is not available for XY charts.</p>
Number of Points	<p>Allows you to specify the number of points in the chart. Limits the chart's data display for each data source to no more than the number specified.</p> <p><b>NOTES:</b></p> <ul style="list-style-type: none"> <li>• You cannot specify the number of points for SPC or Histogram charts.</li> <li>• Do not select 2 for the number of points setting if your chart is a Line/Multiline chart and your chart includes both the graph and the table. Doing so will cause the graph to dis-</li> </ul>

	<p>appear.</p> <ul style="list-style-type: none"> <li>• If you set the Number of Points too high, the Hourglass will continuously flicker. In most cases, the default value of 500 is high enough to accommodate the data points required and low enough to avoid this situation.</li> <li>• For XY charts, using historical data sources, the value in the Number of Points field adjusts automatically to the value closest to the value you entered that will produce evenly spaced data, based on the duration configured and the automatically calculated interval.</li> </ul>
Show Time Cursor	<p>Allows you to configure whether the time cursor will display at run time as tool tips or as a table.</p> <p>Charts in upgraded pictures which display the time cursor will be configured as a table. The default for new charts in new pictures is as tool tips.</p> <p>In run mode, if the time cursor is configured as tool tips, clicking in the plot area freezes the time cursor where clicked; clicking again frees the cursor.</p> <p><b>IMPORTANT:</b> You must also have the Selectable check box enabled for the Show Time Cursor option to work.</p>
Show Hover Tool Tip	<p>Displays a tool tip for the data point that the mouse is placed over.</p> <p><b>IMPORTANT:</b> You must also have the Selectable check box enabled for the Show Hover Tool Tip option to work.</p>
Display Milliseconds	<p>Displays milliseconds on the time axis and time cursor in the chart and milliseconds in the (Interval) Time field.</p> <p><b>NOTE:</b> This field is not available for XY charts.</p>
Enable Advanced Graphics	<p>Allows you to improve the visual quality of the chart by permitting the use of bitmap/gradient styles, drop-shadow, 3D effects, a variety of plotting style lines and improved font appearance. Disabling this option removes smoothing from fonts and graphics (Anti-Aliasing), as well as disabling transparencies (Alpha Blending) and removing Bitmap and Gradient functionality.</p> <p><b>IMPORTANT:</b> Enabling Advanced Graphics may affect chart plotting performance.</p>
Enable Quick Configure	<p>Allows you to change chart properties while in run mode without having to display the configuration dialog or the right-click menu. The Quick Configure chart properties that can be modified in run mode are:</p> <ul style="list-style-type: none"> <li>• Y Axes Style - Hovering over the upper left hand corner of the chart displays Multiple, Stack, or Single buttons that can be used to display the Y Axes of the chart in the specified format.</li> <li>• Y Axes Always Visible - Clicking the far right column in</li> </ul>

	<p>the Data Source Legend area allows you to toggle between Yes and No to set the Y Axis Always Visible property for each data source.</p> <ul style="list-style-type: none"> <li>Plot Visible - Clicking the next-to-last column in the Data Source Legend area allows you to toggle between Yes and No to set the Plot Visible property for each data source.</li> </ul> <p><b>NOTE:</b> This property applies only to the Line and XY Charts.</p>
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#### Duration

**NOTE:** These fields do not apply to XY charts plotting real-time data.

Item	Description
Days	<p>Allows you to enter the number of days for the duration of the display. This field can be used in conjunction with the following field.</p> <p>The duration for the display determines how much data to display on the x axis. The minimum duration for a display is 1 second; the maximum is 365 days, 23 hours, 59 minutes, and 59 seconds.</p> <p>The durations apply to all chart data sources.</p>
Time	<p>Allows you to enter the number of hours, minutes and seconds for the duration for the display. This field can be used in conjunction with the preceding field.</p>

#### Export

Click to access the Exporting dialog box.

#### Snapshot

Click to get a maximized static snapshot of the chart, presented at full-screen size.

### Data Sources - Enhanced Chart Customization Dialog Box

The Data Sources tab of the Enhanced Chart Customization dialog box displays the following items:

#### Data Sources List

Item	Description
Data Source Selection List	<p>Allows you to add a data source to your chart by double-clicking a blank field in the list. You can apply different legend, data limits, time constraints, and general axis information for each data source that you add.</p> <p>Acceptable data sources:</p> <ul style="list-style-type: none"> <li>X Bar, R Bar, and S Bar - SD block (Statistical Data)</li> <li>Histogram - HS block (Histogram)</li> <li>Line/Multiline - Any block</li> <li>XY - Any block, except SD, HS, ETR, SQT, SQD, or PA</li> </ul> <p>Any changes made to the Data Sources List are applied immediately;</p>

	<p>clicking Cancel does not undo any changes.</p> <p>Allowable number of data sources, by chart type:</p> <ul style="list-style-type: none"> <li>• X Bar, R Bar, S Bar, and Histogram - one</li> <li>• XY - two (one for the X axis and one for the Y axis)</li> <li>• Line/Multiline - multiple</li> </ul> <p><b>NOTES:</b></p> <ul style="list-style-type: none"> <li>• In the configuration mode for XY charts, it is possible to enter a real-time data source with partial tag group substitutions (for example, fix32.@server1@.tag@.f_cv) and a historical data source. However, in run mode, the quality column in the legend displays a Type Mismatch error code because the data types do not match.</li> <li>• If you change the data source type for an existing data source, any user-modified entries in the Data, Time, Legend, and Y Axis tabs will not re-default. To reset default values for a data source, the existing data source should be deleted, and a new data source should be added.</li> <li>• GE Historian Data Sources using expressions (for example, Hist1.INFO10.Simulation00001 + 30) are not supported for Enhanced Charts.</li> </ul>
Add	Allows you to add a data source to the chart. 
Delete	Allows you to remove a data source from the chart. 
Move Up	Allows you to move the selected data source up in position in the list. 
Move Down	Allows you to move the selected data source down in position in the list. 

## X Axis

Allows you to select the data source to use for the X axis.

**NOTES:**

- By default, the data source at the top of the Data Sources List is used for the X axis.
- This field is only available for XY charts.
- Any changes made to the X axis selection are applied immediately; clicking Cancel does not undo any changes.

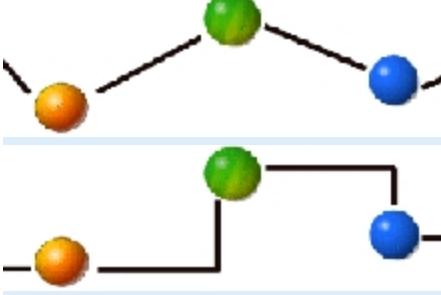
**Apply to All Data Sources**

For XY Charts and XY Chart Dynamos, the Apply to all Data Sources check box is disabled when you select the Time tab. The Time tab is enabled when the data source selected is the one being used for the X-Axis. The time for Historical data sources is kept in sync so any change to time is propagated to the other historical data sources.

For the Line Chart Dynamo, the Apply to all Data Sources check box is disabled when you select the Time tab. The Time tab is enabled if the data source is historical or Tag Group. Any change made on a Time tab is synchronized to all other Historical and Tag Group data sources.

For the Line Chart, the Apply to all Data Sources check box is enabled and available to be checked when the Time tab is selected. Unless this check box is checked and the Apply or OK button is pressed, the changes made to the Time tab apply only to the data source currently selected.

#### Data Tab

Item	Description
High Limit	Specify the high limit value for the selected data source.
Low Limit	Specify the low limit value for the selected data source.
Fetch Limits	Select this check box to specify that at run-time, the low and high limits of the selected data source are retrieved. Clear the check box to activate the High and Low Limit fields.
Show Gaps	Determines whether a blank space or a line is displayed to represent an area in a plot where there is no data.  <b>NOTE:</b> This field is not available for XY charts.
Interpolate Data	Causes the lines between plotted data to display as slopes, rather than flat lines. In the following illustration, the line on the left uses interpolated data. The line on the right does not.    <b>NOTE:</b> This field is not available for XY charts.
Maximum Display Points	Specify the number of data points to display for a data source over a given duration; the duration is indicated on the General Tab. This number cannot exceed the number specified on the General Tab in the Number of Points field.  <b>NOTE:</b> This field is not available for XY charts.
Historical Mode	Allows you to determine how iFIX selects data from a historical data source and displays it in the chart, and determines what each displayed value represents. The options are: <ul style="list-style-type: none"> <li>• <b>Sample</b> - The last valid value found is trended, up to and including the start of the interval.</li> <li>• <b>Avg</b> - The average of all valid data found during the interval is trended, starting at the beginning of the interval, 12:00:00.</li> <li>• <b>High</b> - The highest valid data point value found during the interval</li> </ul>

	<p>is trended, starting at the beginning of the interval, 12:00:00.</p> <ul style="list-style-type: none"> <li>• <b>Low</b> - The lowest valid data point value found during the interval is trended, starting at the beginning of the interval, 12:00:00.</li> <li>• <b>Interpolated</b> - The data is interpreted by assuming that the line between two values is a straight line. All points along that line are estimated except the starting point and the ending point.</li> <li>• <b>Trend</b> - The raw data for the minimum and maximum values for each interval is returned.</li> </ul> <p><b>NOTE:</b> This field is not available for XY charts.</p>
--	--

## Time Tab

### NOTES:

- The following fields are only available if the data source is historical.
- For XY charts, configuration choices made for the X axis data source are also applied to the Y axis data source.
- For Line, X-Bar, R-Bar, S-Bar, and Histogram Charts, if the Apply To All Data Sources check box is checked, the selections you make on the Time tab are applied to all data sources.

Item	Description
Fixed Date	Specifies whether to enter a specific date on which to start the display.
Days Before Now	Specifies whether to enter the number of days prior to today to start the display. Allows you to enter the number of days prior to today to start the display. For example, if you want to define a time group to display data collected two days before the current date, enter 2.
Fixed Time	Specifies whether to designate a specific time to start the display, based on a 24 hour clock.
Lock Time	Locks the Fixed Time, even if you change the time zone in the Date and Time Properties dialog box in the Control Panel. This field is available only when you designate a specific time to start the display using the Fixed Time field.
Duration Before Now	Specifies whether to enter the duration prior to the current time to start the display. The minimum duration for a display is 0 seconds; the maximum is 23 hours, 59 minutes, and 59 seconds.
Time Zone	Allows you to select the time zone to associate with the start time. You can select the client time (time zone for your computer), the server time (time zone used by the Historian server), or the tag time (uses the time zone bias of the tag, which is set in Historian). The default time zone is that of the client machine. This field is available only when Historian is used.
Adjust for Daylight Savings Time	Adjusts the time if the zone you selected is experiencing daylight saving. This field works only if you selected the Automatically adjust clock for daylight saving changes check box located on the Time Zone tab of the Date/Time Properties dialog box in the Control Panel. This field is available only when Historian is being used.
Duration	The Duration fields on this tab are display-only. The information dis-

	playing in these fields come from the Duration specified on the General Tab. The fields specify the amount of data your chart displays along the time (X) axes. On the General Tab, you can enter any value from 0 to 365 days in the Days field. In the Time field, enter the time in hours, minutes, and seconds. You can enter any time up to 23 hours, 59 minutes, and 59 seconds.
Interval	The Interval fields are display-only. If you are using a historical data source, the Interval value is automatically calculated to a time that results in evenly spaced data, based on the Duration and Number of Points specified on the General tab.

#### Legend Tab

**NOTE:** If the Apply To All Data Sources check box is checked, the selections you make on the Legend tab are applied to all data sources.

Item	Description
Source	Specifies if the chart's data source appears in the legend.
Description	Specifies that a description of the data source appears in the legend.
Quality	Specifies that a description of the quality of the data source appears in the legend. This option is not available for histogram charts.
Value	Specifies that the value of the chart's data source appear in the legend. This option is not available for histogram charts.
Low Limit	Specifies that the low limit specified on the Data Source Data tab appears in the legend.
High Limit	Specifies that the high limit specified on the Data Source Data tab appears in the legend.
Eng Units	Specifies the engineering units for the data source connected to the legend item for the specified pen. This check box is selected for new charts and not selected for old charts.

#### Y Axis Tab

##### NOTES:

- This tab is available only for Multi-Line and XY charts.
- Although the Y Axis tab has fields enabled for an X Axis Data Source, and the various check boxes, bullets, and fields can be changed and saved, these selections are ignored if the data source is defined as the X Axis. However, if the X Axis data source is changed to a Y Axis Data Source, these selections are then applied.

This tab allows you to configure multiple Y axes in the XY Chart and Line Multiline Charts. You can now enter up to 16 data sources and individually configure the Y Axis. Multiple axes can be shown in the same graph, or in graphs stacked one on top of the other. Different plotting methods are supported for each data source.

Select a data source in the Data Sources List and then configure the following properties for the Y-Axis:

Item	Description
Title	The Title displayed along the Y Axis for the associated data source.

Y Axis Always Visible	Indicates whether the Y Axis for this data source is always visible.  <b>NOTE:</b> This applies only to the Multiple Y Axes Style.
Use Default Y Axis Settings	Indicates whether default Y Axis settings are displayed in the chart for the associated data source. The default Y Axis settings are those configured in the Axis tab. The Title is the only exception. If it is not empty then it will be used rather than the Y Axis Title configured in Axis tab.  <b>NOTE:</b> Selecting this option disables all other controls in this group.
Use Data Source Limits	If selected, the Y Axis for each data source is set according to the limits of the individual data source.  <b>NOTES:</b> <ul style="list-style-type: none"> <li>This option is available only if Use Default Y Axis Settings is not selected.</li> <li>Selecting this option disables all other Data Source Limits controls in this group.</li> </ul>
Linear/Log	Indicates whether the Y Axis legend for the associated data source is displayed in a linear or logarithmic style.  <b>NOTE:</b> This option is available only if Use Default Y Axis Settings is not selected.
Min	Specifies the minimum value of the Y Axis legend for the selected data source.  <b>NOTE:</b> This option is not available if Use Default Y Axis Settings or Use Data Source Limits is selected.
Max	Specifies the maximum value of the Y Axis legend for the selected data source.  <b>NOTE:</b> This option is not available if Use Default Y Axis Settings or Use Data Source Limits is selected.
Padding	Specifies the spacing between values and the top and bottom of plot area. This can be used to prevent points from being plotted at the very top or bottom of the plot. Valid values are 0-100 and represent a percent of the range (Max - Min). Max and/or Min may be calculated at run time based on selection of the Auto, Max or Min radio buttons.  <b>NOTE:</b> This option is not available if Min/Max is selected.
Auto, Min, Max, Min/Max	Auto allows iFIX to automatically calculate the Max and Min in run mode so that all data points are within the visible area of the chart for the selected data source.  Min allows you to specify the minimum value and automatically calculate the Max for the selected data source.  Max allows you to specify the maximum value and automatically calculate the Min for the selected data source.  Min/Max allows you to specify both the minimum and maximum values for the selected data source.

**NOTE:** This option is not available if Use Default Y Axis Settings or Use Data Source Limits is selected.

#### Export

Click to access the Exporting dialog box.

#### Snapshot

Click to get a maximized static snapshot of the chart, presented at full-screen size.

### Chart Style Tab - Enhanced Chart Customization Dialog Box

The Chart Style tab of the Enhanced Chart Customization dialog box displays the following items:

#### Border Style

Item	Description
Shadow	Specifies whether the chart has a drop-shadow.
No Border	Specifies whether the chart has a border.
Line	Specifies whether the chart has a line border.
3D Inset	Specifies whether the chart is inset.

#### Numeric Precision

**NOTE:** Even though you set the numeric precision, the number of decimal points specified does not appear on the chart unless it is necessary. For example, if you specified the use of two decimal places, but all of the data values in your chart are whole numbers, decimal points would not be used because they are not necessary. This setting does not apply to the axes graduations and ticks.

Item	Description
0	Specifies the use of no decimals.
1	Specifies the use of one decimal.
2	Specifies the use of two decimals.
3	Specifies the use of three decimals.
4	Specifies the use of four decimals.
5	Specifies the use of five decimals.
6	Specifies the use of six decimals.
7	Specifies the use of seven decimals.

#### Miscellaneous

Item	Description
Mark Data Points	Specifies whether each individual data point is plotted on the chart.
Show Plotting Style Legend	Specifies whether the legend appears on the chart. The plotting style legend shows the line type or point type, color, and data source.
Show Data Source Legend	Specifies whether the data source legend appears on the chart. The data source legend appears at the bottom of the chart and includes the tag name and other items specified on the Legend tab of the Data Sources tab.

Thumbnail	<p>Specifies that only the Title, Sub Title, and Value field of the Data Source Legend and the graph portion of the chart is displayed, so that it can be displayed as a thumbnail and still be legible. The Title and Sub Title will only be displayed if the Title or Sub Title is defined, and the Value field of the Data Source Legend will only be displayed if Show Data Source Legend is true.</p> <p>An Enhanced Chart in thumbnail mode can be expanded and contracted using the <a href="#">Expandable</a> option on the General tab. When expanded, the displayed chart will not be in thumbnail optimized mode, but with user configured legend settings. When contracted, it will revert back to the thumbnail settings.</p>
Truncate Titles	Specifies that longer titles on the chart can be truncated for better legibility.
Include Data Labels	<p>Specifies whether data labels are placed next to data points. The labels have the number of decimal places specified in the Numeric Precision field.</p> <p><b>NOTES:</b></p> <ul style="list-style-type: none"> <li>• This option is available only for XY charts.</li> <li>• Data Labels should be used only for a small number of points. Using Data Labels for a large number of points can cause charts to run slowly in run mode, and potentially cause the Workspace to freeze.</li> </ul>

#### Grid Lines

Item	Description
Grid in Front of Data	Specifies that the grid appears in front of the data.
Extend Y Axis Ticks	Specifies whether Y Axis minor ticks are extended across the chart.
<b>NOTE:</b> You can choose only one line display option from the following four choices.	
None	Specifies that no grid lines display on the chart.
X	Specifies that only grid lines for the X-axis display on the chart.
Y	Specifies that only grid lines for the Y-axis display on the chart.
Both	Specifies that grid lines for both the X and Y-axes display on the chart.
<b>NOTE:</b> You can only choose one line style from the following five options.	
Thin	Specifies that grid lines are thin.
Thick	Specifies that grid lines are thick.
Dotted	Specifies that grid lines are dotted.
Dashed	Specifies that grid lines are dashed.
One Pixel	Specifies that grid lines are one pixel thick. This setting is primarily for printing, because it only affects the look of a printed chart.

#### Legend Column Widths

**NOTE:** The following settings apply to all data sources legends and not to any individual data source.

Item	Description
Source	Specifies the column width of the data source name in the legend.
Description	Specifies the column width of the data description in the legend.
Quality	Specifies the column width of the data quality in the legend.
Value	Specifies the column width of the data value in the legend.
Low Limit	Specifies the column width of the low limit in the legend.
High Limit	Specifies the column width of the high limit in the legend.
Eng Units	Specifies the column width of the Engineering Units in the legend.
Order	Allows you to display the items you select in any order in the legend (left to right). To rearrange the order in the list, select the item and click the Up or Down arrow.

#### X-Axis Label Orientation

Item	Description
Auto	Specifies that the orientation of the X-axis label is determined by iFIX. <b>NOTE:</b> This option is not available for XY charts.
Vertical	Specifies that the X-axis label is vertical.
Horizontal	Specifies that the X-axis label is horizontal.
Slanted	Specifies that the X-axis label is slanted. <b>NOTE:</b> This option is not available for XY charts.

#### Y Axes Style

**NOTE:** The Y Axes Style fields are available only for Multi-Line and XY charts.

Item	Description
Multiple Axes	Specifies that the graph portion of the chart can be displayed with multiple Y axes.
Stack Axes	Specifies that the graph portion of the chart is displayed with stacked Y axes..
Single Axis	Specifies that the graph portion of the chart is displayed with a single Y axis that accommodates the data range of all the data sources.

#### Display

**NOTE:** The Display fields are not available for the XY chart.

Item	Description
Graph	Specifies that the graph portion of the chart is displayed.
Table	Specifies that the table portion of the chart is displayed in a table.
Both	Specifies that both the graph and table portions of the chart are displayed.

#### Export

Click to access the Exporting dialog box.

### **Snapshot**

Click to get a maximized static snapshot of the chart, presented at full-screen size.

### **Subsets Tab - Enhanced Chart Customization Dialog Box**

**NOTE:** The Subsets tab in the Enhanced Chart Customization dialog box is disabled by default. To enable Subsets for an Enhanced Chart, you must have your Y-Axis Style set to Single Axis. The Y-Axis Style setting is located under the Chart Style tab of the Enhanced Chart.

The Subsets tab of the Enhanced Chart Customization dialog box, which appears only when configuring a Line Chart, displays the following items:

#### **Baseline Subsets to Graph**

Item	Description
Subset Selection List	Allows you to select which subsets will always show in the graph. Those data sources not selected become part of the scrolling subsets.
Select All	Allows you select all data sources to use as subsets.
Clear All	Allows you clear all selected data sources from the subsets to graph.

#### **Scrolling Subsets**

Specifies the number of subsets to view in one group. If zero is selected, no scroll bar appears.

**IMPORTANT:** Pre-defined Scrolling Subset Groups should not be used in conjunction with the Quick Configure buttons. Using the Quick Configure buttons in run mode to change the Y Axis Style or to change a Data Source's Plot Visible option will overwrite any pre-defined Scrolling Subset Groups.

#### **Example**

Assuming there are four data sources, then the following results occur:

Data Sets Selected...	Subsets Specified...	Results...
4	1	Each data source appears separately in four vertically arranged groups in a scrolling chart window.
2	0	Only the two selected data sources appear on a chart.
2	1	Three data sources appear on two charts, which are arranged vertically in a scrolling chart window.

### **Export**

Click to access the Exporting dialog box.

### **Snapshot**

Click to get a maximized static snapshot of the chart, presented at full-screen size.

### **Axis Tab - Enhanced Chart Customization Dialog Box**

The Axis tab of the Enhanced Chart Customization dialog box displays the following items:

## Titles and Labels

Item	Description
X-Axis Title	Allows you to specify the X Axis Title.
Y-Axis Title	Allows you to specify the Y Axis Title.
Show X-Axis	Allows you to specify how the X-axis grid, labels, and title are displayed on the chart.
Show Y-Axis	Allows you to specify how the Y-axis grid, labels, and title are displayed on the chart.
Max X-Axis Labels	<p>Allows you to specify the maximum number (up to 20) of X-Axis labels.</p> <p>The chart logic calculates the number of labels to display on the X Axis based on settings such as chart size, duration, and number of points. When a maximum number is specified, the user can have partial control over this logic to display not more than the specified number of labels regardless of the chart configuration.</p> <p>A value of "Unspecified" means the label spacing is automatically controlled by the chart.</p> <p>For pictures created before iFIX 5.5 that are upgraded, the default value is 0. For all other pictures, the default value is 10.</p> <p><b>NOTE:</b> The Max X-Axis Labels field is only available for the Line Chart.</p>

## Y Axis

Item	Description
Linear	Specifies whether the Y-axis uses linear values.
Log	Specifies whether the Y-axis uses log values.
Auto	Allows iFIX to automatically scale the Y-axis so that all data points are within the visible area of the chart.
Min	Select to activate the Min field.
Max	Select to activate the Max field.
Min/Max	Select to activate both the Min and Max fields.
Use Data Source Limits	Select to allow iFIX to automatically determine the minimum and maximum axis limits using the limits of all selected data sources.
Min	Allows you to specify the minimum value for the Y-axis.
	<b>NOTE:</b> When you select this option the maximum axis value will be automatically scaled based on the data points in the chart and padding field.
Max	Allows you to specify the maximum value for the Y-axis.
	<b>NOTE:</b> when you select this option the minimum axis value will be automatically scaled based on the data points in the chart and padding field.
Padding	Allows you to set the percentage of the total range of the Y-axis allocated to providing space above and below the highest and lowest data points when the axis values are automatically scaled. Padding prevents the data points from intersecting with the top or the bottom of the chart. Acceptable values:

0-100.

Your selection for Auto, Min, Max, or Min/Max determines if and where padding is applied. The selections have the following results:

- Auto - padding is applied to both the bottom and the top of the range.
- Min - padding is applied to the top of the range.
- Max - padding is applied to the bottom of the range.
- Min/Max - padding is not applied.

## X Axis

**NOTE:** The X Axis fields are only available for the XY chart.

Item	Description
Linear	Specifies whether the X-axis uses linear values.
Log	Specifies whether the X-axis uses log values.
Use Data Source Limits	Select to allow iFIX to automatically determine the minimum and maximum axis limits using the limits of all selected data sources.  Clear the checkbox to allow iFIX to automatically scale the X-axis so that all data points are within the visible area of the chart. In effect, this enables auto-scaling.
Padding	Allows you to set the percentage of the total range of the X-axis allocated to providing space above and below the highest and lowest data points. Padding prevents the data points from intersecting with the top or the bottom of the chart. Acceptable values: 0-100.  <b>NOTE:</b> For XY charts, for the X axis, Use Data Source Limits must not be selected for padding to apply.

## Export

Click to access the Exporting dialog box.

## Snapshot

Click to get a maximized static snapshot of the chart, presented at full-screen size.

## Font Tab - Enhanced Chart Customization Dialog Box

The Font tab of the Enhanced Chart Customization dialog box displays the following items:

### Chart Font Size

Item	Description
Large	Specifies that the size of all chart fonts is large.
Medium	Specifies that the size of all chart fonts is medium-sized.
Small	Specifies that the size of all chart fonts is small.

## Font Styles

Item	Description
Main Title	Specifies the font style for the chart's main title. You can also specify if the title is bold, italic, underlined, or any combination.
Sub-Title	Specifies the font style for the chart's sub-title. You can also specify if the title is bold, italic, underlined, or any combination.
Subset / Point / Axis Labels	Specifies the font style for the chart's subset, point, and axis labels. You can also specify if the title is bold, italic, underlined, or any combination.
Table Data	Specifies the font style for the chart's table data.
Sample	Displays a sample of the selected font and typeface options.

## Export

Click to access the Exporting dialog box.

## Snapshot

Click to get a maximized static snapshot of the chart, presented at full-screen size.

## Color Tab - Enhanced Chart Customization Dialog Box

The Color tab of the Enhanced Chart Customization dialog box displays the following items:

### Viewing Style

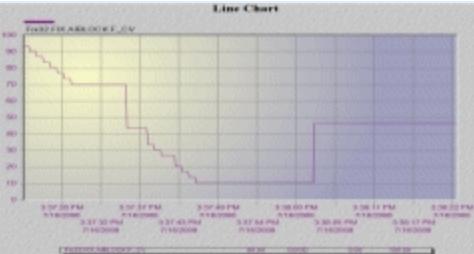
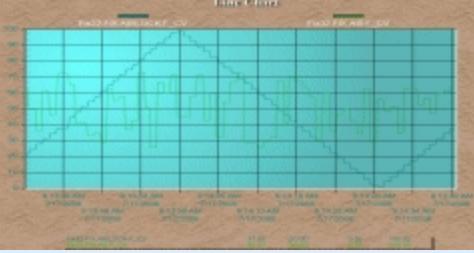
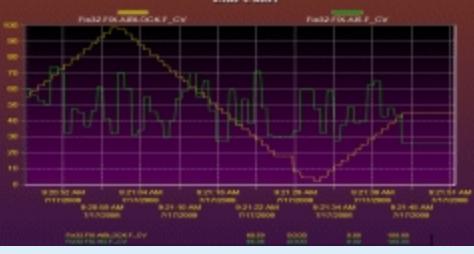
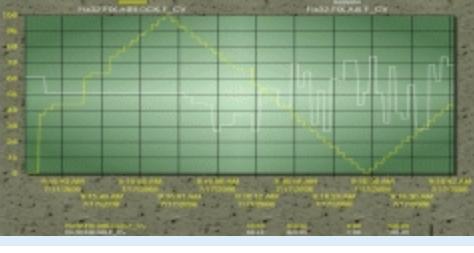
Item	Description
Color	Specifies that the chart displays in color.
Monochrome	Specifies that the chart displays in black, gray and white.  <b>NOTE:</b> The axes, legends and time cursor appear in color, even if this option is selected.
Monochrome and Symbols	Specifies that the chart displays in black, gray and white and includes symbols in the legend.  <b>NOTE:</b> The axes, legends and time cursor appear in color, even if this option is selected.

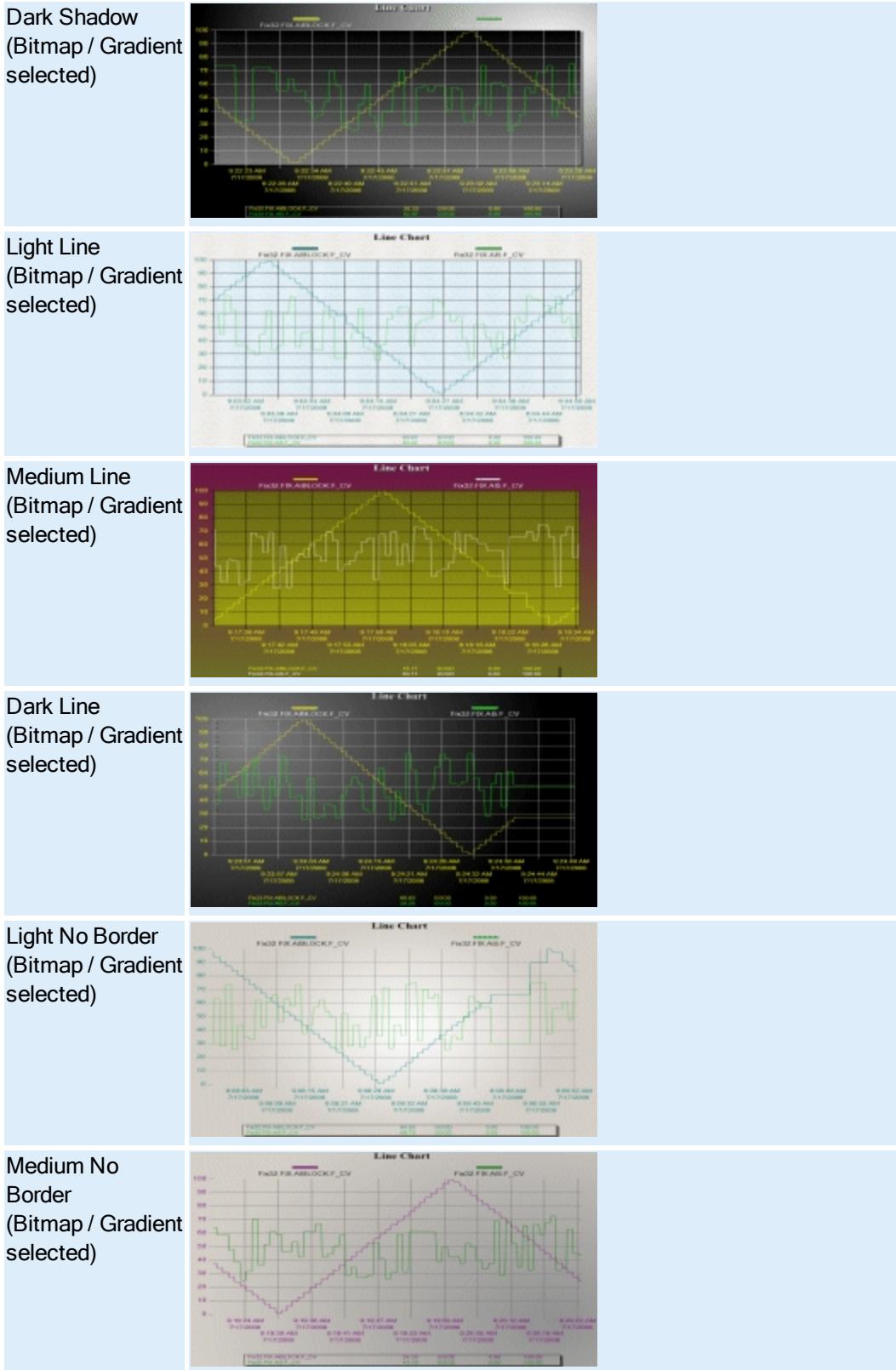
### Graph Attributes

Item	Description
Desk Foreground	Select to allow specification of the color of the title, sub-titles, and legends.
Desk Background	Select to allow specification of the color of the area behind the graph, table, title, sub-titles, and legends.
Shadow Color	Select to allow specification of the color of the drop shadow, if present.
Graph Foreground	Select to allow specification of the color of the graph grid.
Graph Background	Select to allow specification of the graph's background color.
Table Foreground	Select to allow specification of the color of the table's data.

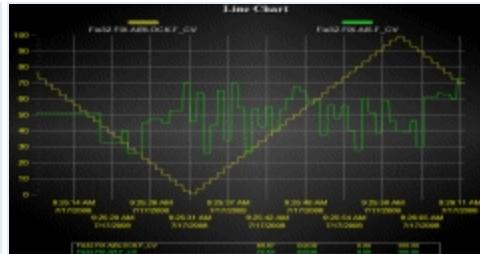
Table Background	Select to allow specification of the color of the table's interior.
Color buttons	Click to choose the desired color for selected graph attributes. Double-click a color button to define a custom color.

### Pre-set Styles

Item	Description
Bitmap / Gradient Styles	Select to choose a bitmap or gradient style for the chart.
Light Inset (Bitmap / Gradient selected)	
Medium Inset (Bitmap / Gradient selected)	
Dark Inset (Bitmap / Gradient selected)	
Light Shadow (Bitmap / Gradient selected)	
Medium Shadow (Bitmap / Gradient selected)	



Dark No Border  
(Bitmap / Gradient selected)



#### Export

Click to access the Exporting dialog box.

#### Snapshot

Click to get a maximized static snapshot of the chart, presented at full-screen size.

### Plotting Style Tab - Enhanced Chart Customization Dialog Box

The Plotting Style tab of the Enhanced Chart Customization dialog box displays the following items:

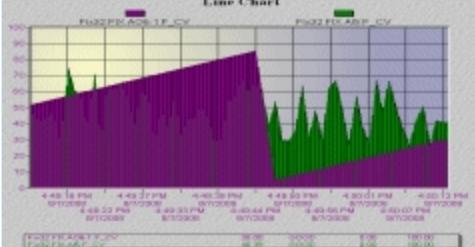
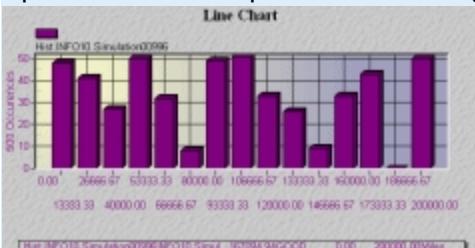
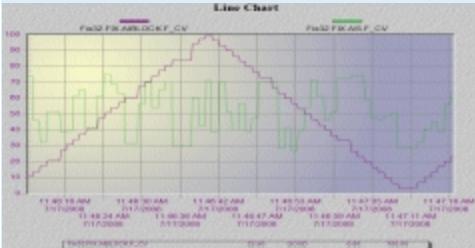
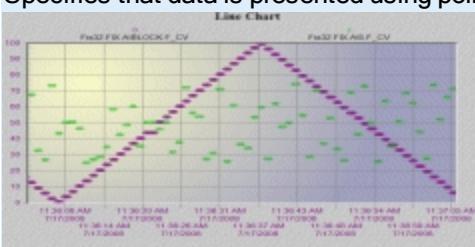
#### Line Style

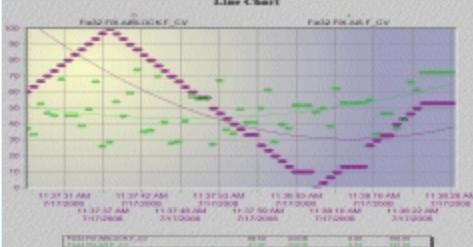
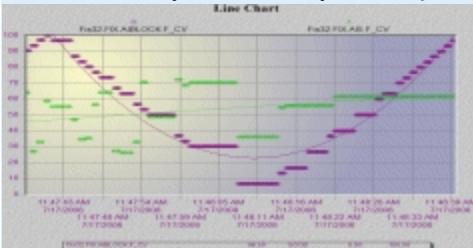
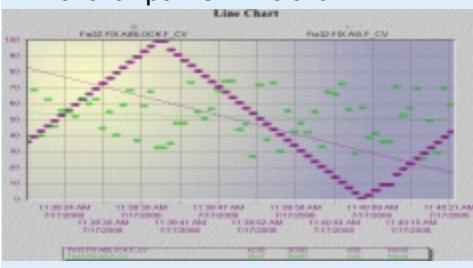
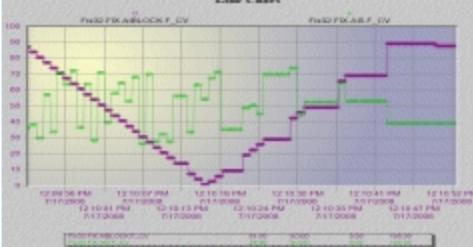
Item	Description
Subset Selection List	Allows you to select the data source that your Color, Point Type, Plotting Style, and Line Type selections will apply to.
Colors	Click to choose the desired color for the selected data source. Double-click a color button to define a custom color.
Point Type	Specifies the point type for the selected data source. <b>NOTE:</b> Point types appear in the chart only if the Chart Plotting Style includes points, such as Point + Line, for example.
Line Type	Specifies the line type for the selected data source.

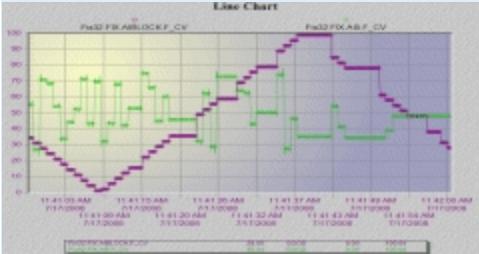
#### Chart Plotting Style

**NOTE:** The following styles are available only for Line/Multiline and XY Charts.

Item	Description
Area	Specifies that the area under the plot line is filled with the color selected in the Line Style area. A line chart titled "Line Chart" showing a single data series filled with a purple gradient. The x-axis shows time from 4:40 PM to 4:50 PM with intervals of 10 minutes. The y-axis ranges from 0 to 100.
Bar	Specifies that data is presented using bars.

	
Histogram	<p>Specifies that data is presented in a histogram.</p>  <p><b>NOTE:</b> This style is not available for XY charts. The Histogram style is only valid for one data source.</p>
Line	<p>Specifies that data is presented using lines.</p>  <p><b>NOTE:</b> When two gapped sections surround a single valid data point, that isolated data point is plotted with a point even though the plotting style is currently a line.</p>
Points	<p>Specifies that data is presented using points.</p> 
Point + Best Fit Curve	<p>Specifies that data is presented showing all data points and plots a best fit curve for all points in the chart.</p>

	
Point + Best Fit Curve II	Specifies that data is presented showing all data points and plots a best fit curve for only the currently visible points in the chart. 
	<b>NOTE:</b> This style is not available for XY charts.
Point + Best Fit Line	Specifies that data is presented showing all data points and plots a best fit line for all points in the chart. 
Point + Best Fit Line II	Specifies that data is presented showing all data points and plots a best fit line for only the currently visible points in the chart. 
	<b>NOTE:</b> This style is not available for XY charts.
Point + Line	Specifies that data is presented using points and lines. 

Point + Spline	Specifies that data is presented using points and splines.
	

Spline	Specifies that data is presented using splines.
	

#### Data Shadows

Item	Description
Off	Specifies that there are no shadows for the chart data.
Shadow	Specifies that there are shadows for the chart data.  <b>NOTE:</b> Shadows can be applied only to Line/Multiline charts that use Area or Bar for their Plotting Style and to Histograms.
3D	Specifies that the chart's data is 3D.  <b>NOTE:</b> 3D can be applied only to Histogram charts. It does not work with SPC Bar charts or Line/Multiline charts.

#### Export

Click to access the Exporting dialog box.

#### Snapshot

Click to get a maximized static snapshot of the chart, presented at full-screen size.

### Exporting Enhanced Chart Dialog Box

The Exporting Enhanced Chart dialog box displays the following items:

#### Export

Item	Description
EMF	Specifies EMF file format for chart export.
WMF	Specifies WMF file format for chart export.
BMP	Specifies BMP file format for chart export.
JPG	Specifies JPG file format for chart export.

PNG	Specifies PNG file format for chart export.
Text/Data	Specifies text/data file format for chart export.

#### Export Destination

Item	Description
Clipboard	Specifies that data is exported to the clipboard.
File	Specifies that data is exported to a file.
Browse	Click to choose a destination file and folder for export.
Printer	Specifies that data is sent to a printer.

#### Export Size

Item	Description
Full Page (available only if Printer is selected in Export Destination)	Prints the exported chart on a full page.
No Specific Size (only available if WMF is selected in Export)	Specifies that no specific size is used for the exported chart.
Pixel (available only if BMP, JPG, or PNG is selected in Export)	Specifies the unit of measure for the exported chart. This option is auto-selected for BMP, JPG and PNG file format and cannot be deselected.
Millimeters	Specifies that the size for the exported chart is measured in millimeters.
Inches	Specifies that the size for the exported chart is measured in inches.
Points	Specifies that the size for the exported chart is measured in points.
Width	Specifies the dimensions for the printed exported chart.  <b>NOTE:</b> The width/height aspect ratio must be between .1 and 10.0 to avoid generating the error "This will produce an image that is hard to read. Please adjust output dimensions." For example, a width/height of 30/300 does not produce an error, but 30/301 does. Likewise, a width/height of 300/30 does not produce an error, but 301/30 does.

**The following fields are available only if Clipboard or File is selected in Export Destination.**

DPI	Specifies the dots per inch. The higher the number the better the quality.
Large Font	Specifies a large size font is used in exported chart.

#### Export

Click to export data to selected destination.

#### Export Enhanced Chart Dialog Box

The Export Enhanced Chart dialog box displays the following items:

#### Export What

Item	Description
Data	Exports the chart's data.
Data and Labels	Exports the chart's data along with the data labels.

#### Export Style

Item	Description
List	Specifies that data is exported in list format.
Tab (only available if List is selected)	Specifies that data is delimited using a tab.
Comma (only available if List is selected)	Specifies that data is delimited using a comma.
Table	Specifies that data is exported in table format.
Subsets/Points (only available if Table is selected)	Specifies that data is exported with one row for the point data and one additional row for each subset.
Points/Subsets (only available if Table is selected)	Specifies that data is exported with one row for each point and an additional column for each subset.

#### Numeric Precision

Item	Description
Current Precision	Exports the data using the level of numeric precision specified on the Chart Style tab.
Maximum Precision	Exports the data using the highest level of numeric precision available on the Chart Style tab, which is seven decimal places.

#### Export

Click to export the data.

## Global Time Control Configuration Dialog Box

The Global Time Control Configuration dialog box displays the following items:

### Time Definition

Item	Description
	Click to set the time to now. The value displayed in this field is applied after clicking OK.
Start Time - Date	Enter the date of the start time. The format for the day comes from your local regional settings.
Start Time - Time	Enter the time of the start time. The format for the time comes from your local regional settings.  <b>NOTE:</b> The Start Time Date and Time settings apply to all objects that contain historical animations.
End Time - Date	Enter the date of the end time. The format for the day comes from your local regional settings. This field is only available if you did not select Define Duration.
End Time - Time	Enter the time of the end time. The format for the time comes from your local regional settings. This field is only available if you did not select Define Duration.  <b>NOTE:</b> The End Time Date and Time settings apply to all objects that contain historical animations.
Define Duration	Select to define the duration of the data, in days, hours, minutes, and seconds. Clear this check box to define the duration using the Start Time and End Time fields.
Days	Enter the number of days for the duration. This field is only available if you selected Define Duration.
Hours	Enter the number of hours for the duration. This field is only available if you selected Define Duration.
Mins	Enter the number of minutes for the duration. This field is only available if you selected Define Duration.
Secs	Enter the number of seconds for the duration. This field is only available if you selected Define Duration.

### Historical Update Rate

Item	Description
Hours	Select the number of hours for the historical update rate.
Mins	Select the number of minutes for the historical update rate.
Secs	Select the number of seconds for the historical update rate.

### Scroll Rates

Item	Description
Scroll as % of Duration	Select to set the scroll rate as a percentage of duration. Clear this check box to enter an exact value for the scroll rate. For example, 1.25 hours, or 75 minutes.

Slow	<p>Enter the slow scroll value in this field, or use the arrows to increase or decrease the value. The Slow Scroll Value applies to both the Forward and Backward Slow Scroll buttons. By default, this value is set to 25 percent.</p> <p>If the Scroll as % of Duration check box is selected, this value is a percentage. For example, if you enter 10, it means 10 percent of the total duration is used for the scroll.</p> <p>If the Scroll as % of Duration check box is cleared, the number you enter is an exact value. For example, if you enter 1.2 and then select the Minutes option, the scroll will be a value of 1.2 minutes.</p> <p><b>NOTE:</b> This value cannot be greater than the value you enter in the Fast field.</p>
Slow - Days	Select to set the unit of measure as days. This field is only available if you did not select Scroll as % of Duration.
Slow - Hours	Select to set the unit of measure as hours. This field is only available if you did not select Scroll as % of Duration.
Slow - Mins	Select to set the unit of measure as minutes. This field is only available if you did not select Scroll as % of Duration.
Slow - Secs	Select to set the unit of measure as seconds. This field is only available if you did not select Scroll as % of Duration.
Fast	<p>Enter the fast scroll value in this field, or use the arrows to increase or decrease the value. The Fast Scroll Value applies to both the Forward and Backward Fast Scroll buttons. By default, this value is set to 50 percent.</p> <p>If the Scroll as % of Duration check box is selected, this value is a percentage. For example, if you enter 10, it means 10 percent of the total duration is used for the scroll.</p> <p>If the Scroll as % of Duration check box is cleared, the number you enter is an exact value. For example, if you enter 1.2 and then select the Minutes option, the scroll will be a value of 1.2 minutes.</p> <p><b>NOTE:</b> This value cannot be greater than the value you enter in the Slow field.</p>
Fast - Days	Select to set the unit of measure as days. This field is only available if you did not select Scroll as % of Duration.
Fast - Hours	Select to set the unit of measure as hours. This field is only available if you did not select Scroll as % of Duration.
Fast - Mins	Select to set the unit of measure as minutes. This field is only available if you did not select Scroll as % of Duration.
Fast - Secs	Select to set the unit of measure as seconds. This field is only available if you did not select Scroll as % of Duration.

## Playback

Item	Description
------	-------------

Enable Playback	Select this check box to enable playback of Historian data. The Historical Update Rate and Scroll Rate functions are unavailable for Playback.
By Speed	Select this option to playback data by a specified speed factor for a system generated frame size for historical data when playback is enabled.
Speed List drop-down	The speed at which the data is stepped through for the specified time period: 1x, 10x, 20x, 40x, 50x, 100x, 200x (with the largest being 200x). The higher the speed, the larger the frame size.
By Frame	Select this option to playback data by a specified frame size. The maximum time for playback is 24 hours.
Hours	The length in hours of the frame size for playback. Valid values are 0-23. After you click out of this field, the informational section below is updated with the new Playback Time, Total Time, and Speed.
Mins	The length of minutes of the frame size for playback. Valid values are 0-59. After you click out of this field, the informational section below is updated with the new Playback Time, Total Time, and Speed.
Secs	The length in seconds of the frame size for playback. Valid values are 0-59. After you click out of this field, the informational section below is updated with the new Playback Time, Total Time, and Speed.

## Grid Settings Dialog Box

The Grid Settings dialog box displays the following items:

### Show the Grid

Select this check box to shows a grid of evenly spaced dots to help you guide the placement of objects for precise vertical or horizontal alignment.

### Snap to Grid

Select this check box to force the top left corner of every object you create or move to stick to the closest grid point.

### Grid Interval

Specifies the amount of space, in pixels, between each evenly spaced dot in the grid.

## Historical Datalink Dialog Box

The Historical Datalink dialog box displays the following items:

### Source

Item	Description
Edit Box	Allows you to enter a data source or expression for this historical data link.  A data source is a reference to a source of information, such as

	<p>historical files.</p> <p>An expression includes constants, data sources, or a combination of constants and data sources that are connected with one or more operators.</p> <p><b>IMPORTANT:</b> Be aware that while GE Historian can store both String and Numeric data, the iFIX data system can only retrieve Numeric data for Historical Datalinks.</p>
Browse Button	Use the Browse (...) button to open the Expression Builder dialog box.
Quick Modify Button	Not available.

### Show Time Stamp with Data

Select this check box to specify that the Historical Datalink include the time stamp with the data. The time stamp appears only at run-time. By default, this check box is selected.

**NOTE:** The following fields, with the exception of the Update Rate fields, are only available if you select a Historical Mode other than Current Value.

### Start Date

Item	Description
Fixed Date	Specifies whether to enter a specific start date for the query of the data source.
Days Before Now	Specifies whether to enter the number of days prior to today to fetch data from GE Historian. For example, if you want to display data collected for the data source two days ago, enter 2.

### Start Time

Item	Description
Fixed Time	Specifies whether to designate a specific time to start. If selected, allows you to enter an explicit start time.
Lock Time	Locks the Fixed Time, even if you change the time zone in the Date and Time Properties dialog box in the Control Panel. This field is available only when you designate a specific time to start using the Fixed Time field.
Duration Before Now	Specifies whether to enter the duration prior to the current time to start. The minimum duration is 0 seconds; the maximum is 23 hours, 59 minutes, and 59 seconds.

### Time Zone

Item	Description
Time Zone	Allows you to select the time zone associated with the start time. You can select the client time (time zone for your computer), the server time (time zone used by the Historian server), or the tag time (uses the time zone bias of the tag, which is set in Historian). The default time zone is that of the client machine. This field is available only when Historian is

	used.
Adjust for Daylight Savings Time	Adjusts the time if the zone you selected is experiencing daylight saving. This field works only if you selected the Automatically adjust clock for daylight saving changes check box located on the Time Zone tab of the Date/Time Properties dialog box in the Control Panel.

### Historical Mode

Allows you to determine how iFIX selects and fetches data from a historical data source and, determines what each displayed value represents. The options are:

- Sample - The last valid value found, up to and including the start of the specified interval.
- Avg - The average of all valid data found during the specified interval.
- High - The highest valid data point value found during the specified interval.
- Low - The lowest valid data point value found during the specified interval.
- Interpolated - The data is interpreted by assuming that the line between two values is a straight line. All points along that line are estimated except the starting point and the ending point.
- Current Value - The current value of the data point.

**IMPORTANT:** The Current Value may update at a rate different from the rate set in the Update Rate field. The update rate is not set solely by the rate entered in the Update Rate field. It also depends on the collection rate, the rate for querying Historian, and the time required to request an update from the Historian server and send it back to the client. As a result, the time it takes to display the updates may be longer than anticipated. Additionally, please be aware that the timestamp for this mode represents the timestamp from the Historian server, not the client.

- Standard Deviation - The standard deviation of all valid data found during the specified interval.
- Total - The total of all valid data found during the specified interval.

### Duration

The duration determines the time range for the historical data source. The minimum duration for a fetch is one second; the maximum is 999 days, 23 hours, 59 minutes, and 59 seconds.

Item	Description
Days	Allows you to enter the number of days. This field can be used in conjunction with the other fields in this area.
Hours	Allows you to enter the number of hours for the duration for the data fetch query. This field can be used in conjunction with the other fields in this area.
Mins	Allows you to enter the number of minutes for the duration for the data fetch query. This field can be used in conjunction with the other fields in this area.
Secs	Allows you to enter the number of seconds for the duration for the data fetch query. This field can be used in conjunction with the other fields in this area.

## **Update Rate**

Allows you to specify the rate at which the data is updated. The default rate is five seconds. Zero is permitted for a one-time fetch. The fastest update rate is five seconds, the slowest is 1:59:59.

Item	Description
Hours	Allows you to enter the number of hours for the rate of data update. This field can be used in conjunction with the other fields in this area.
Mins	Allows you to enter the number of minutes for the rate of data update. This field can be used in conjunction with the other fields in this area.
Secs	Allows you to enter the number of seconds for the rate of data update. This field can be used in conjunction with the other fields in this area.

## **Modify Area Dialog Box**

The Modify Area dialog box displays the following items:

### **Available**

Lists the alarm areas that are currently available. To filter alarms by alarm area, select the area(s) from this list and select the In or Not In option button.

#### **In**

Allows you to filter alarms by the alarm areas that are currently selected in the Available list. When this option is selected, the Alarm Summary object displays only those alarms from the selected alarm areas.

#### **Not In**

Allows you to filter alarms by the alarm areas that are currently selected in the Available list. When this option is selected, the Alarm Summary object ignores all alarms from the selected alarm areas.

### **Add Area Not Currently in List Edit Box**

Allows you to add an alarm area name to the Available list, if it does not appear by default. Enter the alarm area name in this field and click Add to add it to the list.

### **Add Button**

Allows you to add an alarm area name to the Available list, if it does not appear by default. Enter the alarm area name in the Add Area Not Currently In List field and click this button to add it to the Available list.

## **Modify Configuration Dialog Box**

You access the Modify Configuration dialog box from the Create Picture Wizard. The Modify Configuration dialog box displays the following items:

## Attributes Tab

Item	Description
Show Title Bar	Adds a title bar to your picture.
Show System Menu	Adds system menus to your picture.
Resizable	Adds sizing borders to the picture.
Always on Top	Configures the window so that it is always on top when you open it.
Allow this Picture to be Cached	Configures the window so that when it is opened and closed it is held in memory and, when reopened, is read from memory.
Background Color	Click the Background Color button to set the actual background color of the picture. This color will not appear in the preview pane, since the colors in the preview pane are used only in the Create Picture Wizard.

## Sizes Tab

Item	Description
Left	Distance from the left of the screen to the left edge of the picture.
Top	Distance from the top of the screen to the top edge of the picture.
Width	Distance from the left edge of the picture to the right edge of the picture.
Height	Distance from the top edge of the picture to the bottom edge of the picture.
Percentage Units	Indicates the size and location of the picture is based on percentage of the screen.
Pixel Units	Indicates the size and location of the picture is based on the number of pixels.

## Help

Displays the Help for the current topic.

## Save

Saves the changes for this picture only.

## Save As

Saves the current options as a new configuration. When you select this option, the Enter New Configuration Name dialog box appears. Enter the name for the new configuration (up to 80 characters) in the Name field, then click OK to return to the Modify Configuration dialog box.

## Return to Wizard

Closes the Modify Configuration dialog box and returns to the Create Picture Wizard.

## Modify Pipe Characteristics Dialog Box

The Modify Pipe Characteristics dialog box display the following items:

#### **Preview**

Displays a preview of the object with the properties you select.

#### **Start Cap**

Specifies the start cap you want to apply to the selected pipe. Start caps can be round, square, horizontal-diagonal, or vertical-diagonal. Start caps are determined by the point where you start the pipe drawing.

#### **End Cap**

Specifies the end cap you want to apply to the selected pipe. End caps can be round, square, horizontal-diagonal, or vertical-diagonal. End caps are determined by the point where you end the pipe drawing.

#### **Elbow**

Specifies the elbow style you want to apply to the selected pipe. Elbow styles can be either round or square.

#### **Foreground**

Click this button to open the Select Color dialog box where you can choose the foreground color for the selected object.

#### **Blend Slider**

Move this slider to apply the desired amount of fade color to the selected foreground type.

#### **Fade**

Click this button to open the Select Color dialog box where you can choose the fade color for the selected object.

#### **Edge Style**

Specifies the edge style you want to apply to the selected pipe. Edge styles for pipes can be either solid or none.

#### **Fill Style**

Specifies the fill style you want to apply to the selected pipe. Fill styles for pipes can be either solid or gradient. If you select Gradient, the fade type of the pipe defaults to reflected, and cannot be changed.

#### **Thickness**

Specifies the thickness you want to apply to the selected pipe. Pipe thickness can range from 10 to 300 pixels.

#### **Edge Width**

Specifies the edge width, in pixels, you want to apply to the selected pipe. Edge widths can range from 1 to 200 pixels.

## [\*\*New Level Dialog Box\*\*](#)

The New Level dialog box displays the following items:

#### **Low**

If configuring an exact match data conversion table, this field allows you to specify the exact value that incoming data must match in order to format the data as the corresponding output value. If configuring a range comparison data conversion table, this field allows you to specify the low value of the range that incoming data must match in order to format the data as the corresponding output value.

#### **High**

Allows you to specify the high value of the range that incoming data must match in order to format the data as the corresponding output value.

#### **Primary**

Allows you to specify the output value to which you want to convert the input value or range of values in the lookup table.

#### **Toggle**

Allows you to specify a second output value to which you want to convert the input value or range of values in the lookup table, essentially providing a second animation for the object.

## [\*\*Select BackgroundColor Dialog Box\*\*](#)

The Select BackgroundColor dialog box displays the following items:

#### **Property**

Displays the color property (foreground, background, or edge) for which you are currently defining a color.

#### **Color Set**

Lists all color sets that are currently configured on your system. You can add your own customized color set by clicking the Color button on the Toolbar to bring up the Color Selection dialog box, then clicking the New Color Set button.

#### **Color Tab**

Allows you to attribute a color for the selected object. To change an object's color, click the Color tab, select a color from the color box, and click OK. Optionally, you can attribute a named color by clicking the Name tab, selecting the name of a color from the list, and clicking OK.

#### **Name Tab**

Displays the named colors of the color set listed in the Color Set list. To change the name of a color, double-click it from the list and enter a new name in the highlighted field.

## [\*\*Select Color Dialog Box\*\*](#)

The Select a Color dialog box displays the following items:

### **Property**

Displays the color property (foreground, background, or edge) for which you are currently defining a color.

### **Color Set**

Lists all color sets that are currently configured on your system. You can add your own color set by clicking the New Color Set button, naming the color set, and customizing the individual colors within the set.

### **Color Tab**

Allows you to attribute a color for the selected object. To change an object's color, click the Color tab, select a color from the color box, and click OK. Optionally, you can attribute a named color by clicking the Name tab, selecting the name of a color from the list, and clicking OK.

### **Name Tab**

Displays the named colors of the color set listed in the Color Set list. To change the name of a color, double-click it from the list and enter a new name in the highlighted field.

## **Select EdgeColor Dialog Box**

The Select EdgeColor dialog box displays the following items:

### **Property**

Displays the color property (foreground, background, or edge) for which you are currently defining a color.

### **Color Set**

Lists all color sets that are currently configured on your system. You can add your own customized color set by clicking the Color button on the Toolbar (Classic view) or on the Format tab, in the Styles group, by clicking Color Selections (Ribbon view) to bring up the Color Selection dialog box, then clicking the New Color Set button.

### **Color Tab**

Allows you to attribute a color for the selected object. To change an object's color, click the Color tab, select a color from the color box, and click OK. Optionally, you can attribute a named color by clicking the Name tab, selecting the name of a color from the list, and clicking OK.

### **Name Tab**

Displays the named colors of the color set listed in the Color Set list. To change the name of a color, double-click it from the list and enter a new name in the highlighted field.

## **Select FadeColor Dialog Box**

The Select FadeColor dialog box displays the following items:

### **Preview**

Displays a preview of the object with the properties you select.

### **Linear**

Select this option to apply a linear fade effect to the selected fade color.

### **Reflected**

Select this option to apply a reflected fade effect to the selected fade color.

### **Radial**

Select this option to apply a radial fade effect to the selected fade color.

### **Concentric**

Select this option to apply a concentric fade effect to the selected fade color.

### **Foreground**

Click this button to open the Select Color dialog box where you can choose the foreground color for the selected object.

### **Blend Slider**

Move this slider to apply the desired amount of fade color to the selected fade type.

### **Fade**

Click this button to open the Select Color dialog box where you can choose the fade color for the selected object.

### **Gradient Angle Slider**

Move this slider to apply the desired angle of fade color to the selected fade type.

## **Select ForegroundColor Dialog Box**

The Select ForegroundColor dialog box displays different items, depending on whether the object that has been selected has a gradient color fill or not. Consult the following tables for descriptions in each case:

### **Gradient Color Fill**

Item	Description
Preview	Displays a preview of the object with the properties you select.
Linear	Select this option to apply a linear fade effect to the selected fade color.
Reflected	Select this option to apply a reflected fade effect to the selected fade color.
Radial	Select this option to apply a radial fade effect to the selected fade color.
Concentric	Select this option to apply a concentric fade effect to the selected fade color.

Foreground	Click this button to open the Select Color dialog box where you can choose the foreground color for the selected object.
Blend Slider	Move this slider to apply the desired amount of fade color to the selected fade type.
Fade	Click this button to open the Select Color dialog box where you can choose the fade color for the selected object.
Gradient Angle Slider	Move this slider to apply the desired angle of fade color to the selected fade type.

### Non-Gradient Color Fill

Item	Description
Property	Displays the color property (foreground, background, or edge) for which you are currently defining a color.
Color Set	Lists all color sets that are currently configured on your system. You can add your own customized color set by clicking the Color button on the Toolbar to bring up the Color Selection dialog box, then clicking the New Color Set button.
Color Tab	Allows you to attribute a color for the selected object. To change an object's color, click the Color tab, select a color from the color box, and click OK. Optionally, you can attribute a named color by clicking the Name tab, selecting the name of a color from the list, and clicking OK.
Name Tab	Displays the named colors of the color set listed in the Color Set list. To change the name of a color, double-click it from the list and enter a new name in the highlighted field.

### Shelve Alarm Dialog Box

The Shelve Alarm dialog box contains the following items:

#### Preset Duration

If you select this option, you can choose from up to five preselected durations.

#### Maximum Duration

Select this option to shelve the alarm for the maximum amount of time defined by the associated policy.

#### Custom Duration

Select this option to enter a specific amount of time to shelve the alarm.

## **Shelve**

Select this button to shelve all alarms that appear in the Alarm List.

### **Shelve Multiple Alarms Dialog Box**

The Shelve Multiple Alarms dialog box contains the following items:

#### **Preset Duration**

If you select this option, you can choose from up to five preselected durations to shelve the selected alarms.

#### **Maximum Duration**

Select this option to shelve the selected alarms for the maximum amount of time defined by the associated policy.

#### **Custom Duration**

Select this option to enter a specific amount of time to shelve the selected alarms.

#### **Alarm List**

The alarms selected in the Alarm Summary list that you want to shelve.

#### **Shelve**

Select this button to shelve all alarms that appear in the Alarm List.

### **Upgrade Pictures to Screen Independent Enhanced Coordinate Dialog Box**

The Upgrading Pictures to Screen Independent Enhanced Coordinates Dialog Box allows you to upgrade one (or more) picture or Dynamo Set from the legacy Logical Coordinate System to the Enhanced Coordinate System. This dialog box displays the following items:

#### **File Type**

Allows you to select the file type to display in the Select Files window. You can select Pictures or Dynamo Sets or both.

#### **Picture and Dynamo Set Folder Path**

Lists the path to the folder that contains the pictures and/or Dynamo Sets you want to upgrade to Enhanced Coordinates, or to restore to Logical Coordinate System.

#### **Browse (....)**

Allows you to select a different folder that contains the files you want to upgrade or restore.

#### **Refresh File List**

Updates the files in the Select Files window to reflect eligible files in the folder you selected.

### **Upgrade Files**

Upgrades the selected files to the screen independent Enhanced Coordinates System. By default, this button is enabled when the dialog box opens.

### **Restore Files from Backup**

Restores selected files from the Backup folder. When you select this option, files that are eligible for restoration are listed in the Select Files window.

### **Select Files**

Lists files that are eligible for upgrading or restoration. Files eligible for upgrading include files that are not using the Enhanced Coordinates System and that are not open in the iFIX WorkSpace. By default, the picture files in your default directory display. Files that are eligible for restoration are those files that have been upgraded and for which a backup file exists in the Backup folder.

### **Buttons**

Button	Description
Select All	Selects all the files listed in the Select Files window.
Deselect All	Clears all the files selected in the Select Files window.
Upgrade Files	Upgrades pictures and/or Dynamo Sets using the Logical Coordinate System to the Enhanced Coordinate System.
Restore Files	Restores the upgraded picture and/or Dynamo Set to the previously saved file in the Backup folder when the file exists. All changes made to the file since the upgrade will be lost. After the restoration operation is completed, the restored files are removed from the list in the Select Files window and are returned to the list of files eligible for upgrading.

## **How Do I...**

The following sections explain how to work with pictures in the iFIX WorkSpace:

- [Working with Objects](#)
- [Working with Charts](#)
- [Working with Enhanced Charts](#)
- [Working with the Alarm Summary Object](#)
- [Working with Groups](#)
- [Using Color](#)

Click a section above for steps on how to use or configure this part of a picture.

### **Working with Objects**

In the iFIX WorkSpace, you can perform the following steps with objects:

- [Adding, Drawing, and Creating Objects](#)
- [Manipulating Objects](#)

## Adding Charts to Pictures

► To add a chart to your picture:

1. In Classic view, in the iFIX WorkSpace, on the Shapes toolbar, click the desired chart button.

-Or-

In Ribbon view, on the Insert tab, in the Charts group, click the desired chart type.

-Or-

If the Toolbox is enabled, click the Chart button on the Toolbox.

The cursor changes to a plus sign.

2. Click and drag the mouse to define an area of the picture where you want to place the chart, and release the mouse.

**TIP:** To add multiple charts, double-click the desired chart button on the Toolbox. When you are done adding charts, press ESC, click another button, or click the pointer selection tool in the Toolbox.

## Adding, Drawing, and Creating Objects

In the iFIX WorkSpace, you can perform the following steps to add, draw, or create objects:

- [Adding Charts to Pictures](#)
- [Adding Text to Pictures](#)
- [Adding Bitmaps to Pictures](#)
- [Adding Data Links to Pictures](#)
- [Adding Data Links Using the Data Entry Expert](#)
- [Adding Historical Data Links to Pictures](#)
- [Adding the Current Time to Pictures](#)
- [Adding the Current Date to Pictures](#)
- [Drawing Rectangles, Rounded Rectangles, Ovals, Pipes, and Lines](#)
- [Drawing Polylines and Polygons](#)
- [Drawing Arcs, Chords, and Pies](#)
- [Creating Variable Objects](#)
- [Creating New Objects from Files](#)
- [Creating New OLE Objects](#)
- [Creating a Control for a New OLE Object](#)
- [Creating Timer Objects](#)

- [Creating Event Objects](#)
- [Create a Custom Lookup Table](#)
- [Selecting Commands Using the Multiple Command Script Wizard](#)

## Adding Text to Pictures

### ► To add text to your picture:

1. In Classic view, in the iFIX WorkSpace, on the Shapes toolbar, click the Text button.  
-Or-  
In Ribbon view, on the Insert tab, in the Object/Links group, click Object/Links, and then click Text.  
-Or-  
If the Toolbox is enabled, click the Text button on the Toolbox.  
The cursor changes to an I-beam.
2. Position the cursor where you want the text to appear.
3. Enter the text you want. Use <Backspace> to delete the text and <Enter> to start a new line.

#### TIPS:

- To add multiple text objects, double-click the Text button on the Toolbox. Place the cursor where you want to add the first text object and enter your text. Click outside the text object or press ESC, and then place the cursor where you want to add the second object. Repeat these steps for each text object you want to add.  
When you are done adding text objects click the Text button again, the pointer selection tool, or another button in the Toolbox.
- To edit the text within a text object, you can double-click the text object, or right-click the text object and select Edit Text from the pop-up menu that appears.

## Adding Bitmaps to Pictures

### ► To add a bitmap image to your picture:

1. In Classic view, in the iFIX WorkSpace, on the Shapes toolbar, click the Bitmap button.  
-Or-  
In Ribbon view, on the Insert tab, in the Object/Links group, click Object/Links, and then click Bitmap.  
-Or-  
If the Toolbox is enabled, click the Bitmap button on the Toolbox.  
The cursor changes to a plus sign.
2. Select a file from the Open dialog box and click Open.

**TIP:** To add multiple bitmaps, double-click the Bitmap button on the Toolbox. When you are done adding bitmaps, press ESC, click another button, or click the pointer selection tool in the toolbox.

#### Adding Data Links to Pictures

##### ► To add a data link to your picture:

1. In Classic view, in the iFIX WorkSpace, on the Shapes toolbar, click the Datalink Stamper button.

-Or-

In Ribbon view, from the Insert tab in Objects/Links group, click Objects/Links, and then click Datalink.

-Or-

If the Toolbox is enabled, click the Datalink button on the Toolbox.

2. In the Source field, enter a data source for the data link. To use the Expression Builder, click the Browse button.
3. To enable data entry on the data link, select In-Place from the Type field's drop-down menu. If you want confirmation from the operator when the value is changed, select the Confirm check box.
4. In the Formatting area, select the type of data you want to display from the Type field's drop-down menu.

For numeric data, enter an integer between 0 and 7 to represent the number of whole digits (those before the decimal point) and decimal digits (those after the decimal point) in the Whole Digits and Decimal fields, respectively. If needed, justify the data by making the appropriate selection from the Justify drop-down menu.

Although you can enter an integer between 0 and 40 in the Whole Digits field, when you view the data link in Run mode the number of digits is truncated to at most 7.

For alphanumeric data, enter the number of lines and the number of characters per lines in the Lines and Chars/Lines fields, respectively. If desired, justify the data by making the appropriate selection from the Justify drop-down menu.

For raw data, select the Raw Format check box and enter the format in the Format field.

**NOTE:** To format a data link to display scientific notation, first select a F\_CV, E\_CV or A\_CV field, enable the Raw Format check box, and specify %e in format field. F\_CV and E\_CV datalinks using %e raw format, by default, display 6 places after the decimal point. To display more places after the decimal point, for example 15, change %e to %1.15e. A\_CV datalinks using %e raw format will always display 15 places after decimal point. To display a leading zero in the link, use the F\_CV field and the raw format similar to %02.2f.

5. In the Error Configuration area, select how you want output errors to be defined in the Output Error Mode field. To define errors through an error table, select Use Error Table. To define errors using the current output value, select Use Current Output.
6. Click OK. The cursor changes to a stamper.

7. Position the cursor where you want to place the data link, and click the mouse. The data link appears in the picture. The size of the data link is determined both by the settings you chose in the Datalink dialog box and by the font size you set in the User Preferences dialog box.

**TIP:** In Classic view, access the User Preferences dialog box from the WorkSpace menu. In Ribbon view, access User Preferences from the Home tab, in the WorkSpace group, in the Settings list. Set the font size on the Shape Preferences tab.

**NOTE:** If you create a data link by selecting Datalink from the Insert menu (Classic View), or by selecting it from the Insert tab, in the Objects/Links group, in the Objects/Links list (Ribbon view), you will first sketch the size of the data link, then configure the content of the data link as described in steps 2 through 5.

#### Adding Data Links Using the Data Entry Expert

##### ► To add a data link using the Data Entry Expert:

1. In the iFIX WorkSpace, double-click a Data link.
  2. In the Data Entry Type field of the Datalink dialog box, select None and click OK.
- NOTE:** If you set the Data Entry Type field to In-Place, unexpected results may occur.
3. In Classic view, on the Standard toolbar, click the Task Wizard button.  
-Or-  
In Ribbon view, on the Tools tab, in the Tasks/Experts group, click the Tasks/Experts dialog box launcher.
  4. From the Task Categories list, select Data Entry Expert and click Perform Task.
  5. In the Data Source field, enter a data source for the data link. To use the Expression Builder, click the Browse button.
  6. In the Choose Data Entry Method area, select the appropriate data entry option.
  7. Set the values of the fields corresponding to the data entry method you chose.
  8. Click OK.

#### Adding Historical Datalinks to Pictures

##### ► To add a historical datalink to your picture:

1. In Classic view, in the iFIX WorkSpace, on the Shapes toolbar, click the Historical Datalink Stamper button.

-Or-

In Ribbon view, from the Insert tab in Objects/Links group, click Objects/Links, and then click Historical Datalink.

-Or-

If the Toolbox is enabled, click the Historical Datalink button on the Toolbox.

2. In the Source field, enter a data source for the historical data link. To use the Expression Builder, click the Browse button.

**IMPORTANT:** Be aware that while GE Historian can store both String and Numeric data, the iFIX data system can only retrieve Numeric data for Historical Datalinks.

**TIP:** To display a one-hour average in your historical data link, in Historian, create a calculation tag to calculate the one-hour average. Then, select the tag that you created when choosing the data source for your historical data link.

3. To display a time stamp with the historical datalink, select the Show Time stamp With Data check box. To hide the time stamp, clear the Show Time stamp With Data check box.
4. From the Historical Mode list, select the data type to display. If you selected Current Value, go to step 9. Otherwise, proceed to step 5.
5. In the Start Date area, choose select either Fixed Date or Days Before Now to set when the date for the display to begin and enter the desired time or value.
6. In the Start Time area, choose either Fixed Time or Duration Before Now to set the start time for the data display and enter the desired time or value.
7. Optionally, to configure the historical datalink to open at the Fixed Time and to ignore changes to the time zone in the Date and Time Properties dialog box in the Control Panel, select Lock Time.
8. Optionally, to adjust for daylight saving time, if it is not already selected, click Adjust for Daylight Savings Time and select a time zone from the Time Zone list.
9. In Duration area, select or enter the time range for the data.
10. In the Update Rate area, select or enter the update rate for the data.
11. Click OK. The cursor changes to a stamper.
12. Position the cursor where you want to place the historical data link, and click the mouse. The historical data link appears in the picture.

#### Adding the Current Time to Pictures

##### ► To add the current time to your picture:

1. In Classic view, in the iFIX WorkSpace, on the Shapes toolbar, click the Time button.

-Or-

In Ribbon view, on the Insert tab, in the Objects/Links group, click Objects/Links, and then click Current Time.

-Or-

If the Toolbox is enabled, click the Time button on the Toolbox.

The cursor changes to a stamper.

2. Position the cursor where you want the time to appear and click again.

**TIP:** To add multiple instances of the current time, double-click the Time button on the Toolbox. When you are done adding instances, press ESC, click another button, or click the pointer selection tool in the Toolbox.

#### Adding the Current Date to Pictures

► **To add the current date to your picture:**

1. In Classic view, in the iFIX WorkSpace, on the Shapes toolbar, click the Date button.  
-Or-  
In Ribbon view, on the Insert tab, in the Objects/Links group, click Objects/Links, and then click Current Date.  
-Or-  
If the Toolbox is enabled, click the Date button on the Toolbox.  
The cursor changes to a stamper.
  2. Position the cursor where you want the date to appear and click again.
- TIP:** To add multiple instances of the current date, double-click the Date button on the Toolbox. When you are done adding instances, press ESC, click another button, or click the pointer selection tool in the Toolbox.

**Drawing Rectangles, Rounded Rectangles, Ovals, Pipes, and Lines**

► **To draw a rectangle, rounded rectangle, oval, pipe, or line:**

1. In Classic view, in the iFIX WorkSpace, on the Shapes toolbar, click the appropriate button.  
-Or-  
In Ribbon view, on the Insert tab, in the Shapes group, click Shapes, and then click the desired shape.  
-Or-  
If the Toolbox is enabled, click the button on the Toolbox.  
The cursor changes to a plus sign.
  2. Place the cursor where you want to draw the shape.
  3. Click and drag in the picture until the shape is the desired size.
- TIP:** To add multiple rectangles, rounded rectangles, ovals, pipes, or lines, double-click the appropriate button on the Toolbox. When you are done adding the objects, press ESC, click another button, or click the pointer selection tool in the Toolbox.

**Drawing Polylines and Polygons**

► **To draw a polyline or polygon:**

1. In Classic view, in the iFIX WorkSpace, on the Shapes toolbar, click the Polyline or Polygon button.  
-Or-  
In Ribbon view, on the Insert tab, in the Shapes group, click Shapes, and then click Polyline or Polygon.  
-Or-

If the Toolbox is enabled, click the button on the Toolbox.

The cursor changes to a plus sign.

2. Place the cursor where you want to start your polyline or polygon.
3. Click once for each point you want in the polyline or polygon. Double-click to end the shape.

**TIP:** To add multiple polylines or polygons, double-click the appropriate button on the Toolbox. When you are done adding the objects, press ESC, click another button, or click the pointer selection tool in the Toolbox.

## Drawing Arcs, Chords, and Pies

### ► To draw an arc, chord, or pie:

1. In Classic view, in the iFIX WorkSpace, on the Shapes toolbar, click the Arc, Chord, or Pie button.

-Or-

In Ribbon view, on the Insert tab, in the Shapes group, click Shapes, and then click the Arc, Chord, or Pie.

-Or-

If the Toolbox is enabled, click the button on the Toolbox.

The cursor changes to a plus sign.

2. Position the cursor where you want the first point of the shape to appear and click the mouse.
3. Drag the cursor where you want the second point of the shape to appear and click the mouse.
4. Move the cursor to define the height and width of the shape and click again.

**TIP:** To add multiple arcs, chords, or pies, double-click the appropriate button on the Toolbox. When you are done adding the objects, press ESC, click another button, or click the pointer selection tool in the Toolbox.

## Creating Variable Objects

### ► To create a variable object:

1. In Classic view, in the iFIX WorkSpace, on the Shapes toolbar, click the Variable Object button.

-Or-

In Ribbon view, on the Insert tab, in the Objects/Links group, click Objects/Links, and then click Variable.

-Or-

If the Toolbox is enabled, click the Variable Object button on the Toolbox.

2. Complete the fields on the Create a Variable Object dialog box. For more information on these fields, click Help.

## **Creating New Objects from Files**

### **► To create a new object from a file:**

1. In Classic view, in the iFIX WorkSpace, on the Insert menu, click the OLE Object.  
-Or-  
In Ribbon View, on the Insert tab, in the Objects/Links group, click Objects/Links, and then click OLE Object.
2. Select the Create from File option.
3. In the File field, enter a directory path and file name, or click Browse to search available drives for a file.

## **Creating New OLE Objects**

### **► To create a new OLE object:**

1. In Classic view, in the iFIX WorkSpace, on the Insert menu, click the OLE Object.  
-Or-  
In Ribbon View, on the Insert tab, in the Objects/Links group, click Objects/Links, and then click OLE Object.
2. Select the Create New option.
3. In the Object Type list box, double-click the object you want to create.

## **Creating a Control for a New OLE Object**

### **► To create a control for a new OLE object:**

1. In Classic view, in the iFIX WorkSpace, on the Insert menu, click the OLE Object.  
-Or-  
In Ribbon View, on the Insert tab, in the Objects/Links group, click Objects/Links, and then click OLE Object.
2. Select the Create Control option.
3. Click OK to create the control.

## **Creating Timer Objects**

► **To create a timer object:**

1. In Classic view, in the iFIX WorkSpace, on the Shapes toolbar, click the Timer Object button.

-Or-

In Ribbon view, on the Insert tab, in the Objects/Links group, click Objects/Links, and then click Timer.

-Or-

If the Toolbox is enabled, click the Timer button on the Toolbox.

2. Complete the fields on the Create a Timer Object dialog box.

**Creating Event Objects**

► **To create an event object:**

1. In Classic view, on the Shapes toolbar, click the Event Object button.

-Or-

In Ribbon view, from the Insert tab, in the Objects/Links group, click Objects/Links, and then click Event.

-Or-

If the Toolbox is enabled, click the Event Object button on the Toolbox.

2. Complete the fields on the Event Object dialog box.

**Selecting Commands Using the Multiple Command Script Wizard**

► **To select one or more commands using the Multiple Command Script Wizard:**

1. In the Basic Animation dialog box, click the Click button or select the Command check box. The Multiple Command Script Wizard appears.
2. Choose a command from the Select Action to Append list. The Expert associated with the command you chose appears.
3. Complete the Expert with your desired settings and information.
4. Click OK. The Expert closes and appears in the Configured Actions list box of the Multiple Command Script Wizard.
5. Optionally, repeat steps 2-4 if you want to add additional commands to your scripted command sequence.
6. When you have finished choosing your command sequence, click OK to return to the Basic Animation dialog box.

**Manipulating Objects**

In the iFIX WorkSpace, you can perform the following steps to manipulate objects:

- [Copying and Pasting Objects as Bitmaps](#)
- [Moving Objects](#)
- [Copying and Pasting Objects](#)
- [Renaming Objects](#)
- [Rotating Objects](#)
- [Changing an Object's Center of Rotation](#)
- [Reshaping Objects](#)
- [Setting the Fade Type of an Object](#)
- [Setting the Gradient Angle of an Object's Fade Type](#)
- [Extending Lines to Intersect](#)
- [Trimming Intersected Lines](#)
- [Making Lines Horizontal or Vertical](#)
- [Converting Lines to a Polyline](#)
- [Converting Lines and Polylines to Pipe](#)
- [Modifying Pipes Overview](#)
- [Modifying Pipe Characteristics](#)
- [Adding and Deleting Connection Points](#)
- [Adding and Anchoring Connectors to Shapes](#)
- [Adding Points to Polygons and Polylines](#)
- [Deleting Points from Polygons and Polylines](#)
- [Splitting Polylines and Pipes](#)
- [Selecting an Object's Color or Style Property](#)
- [Selecting Multiple Objects](#)
- [Aligning Two or More Objects to Each Other](#)
- [Spacing Three or More Objects](#)
- [Flipping Objects](#)
- [Sending Objects in Back of Other Objects](#)
- [Bringing Objects to the Front of Other Objects](#)
- [Making Multiple Objects the Same Size](#)
- [Viewing Tag Status Pictures](#)
- [Viewing Quick Trend Pictures](#)
- [Viewing Tag Control Panel Pictures](#)
- [Adding and Deleting Tags in a Tag Control Panel Picture](#)
- [Saving Tag Lists in a Tag Control Panel Picture](#)
- [Loading Tag Lists in a Tag Control Panel Picture](#)
- [Configuring the Global Time Control](#)

- [Hiding the Historical Datalink Timestamp](#)

#### Copying and Pasting Objects as Bitmaps

##### ► To copy and paste an object as a bitmap image:

1. In the iFIX WorkSpace, select the object you want to copy.
2. In Classic view, on the Edit menu, choose Copy as Bitmap.  
-Or-  
In Ribbon view, on the Home tab, in the Clipboard group, click Copy as Bitmap.
3. In Classic view, on the Edit menu, choose Paste.  
-Or-  
In Ribbon view, on the Home tab, in the Clipboard group, click Paste, and then click Paste.

#### Moving Objects

##### ► To move an object:

1. In the iFIX WorkSpace, select the object you want to move.
2. Click and drag the object to the desired location.

#### Copying and Pasting Objects

##### ► To copy and paste an object:

1. In the iFIX WorkSpace, right-click the object you want to copy, and click Copy.
2. Click anywhere in the picture to de-select the object.
3. Right-click the picture and select Paste.
4. Move the object to where you want it in the picture.

#### TIPS:

- If you want to copy and paste a Windows Metafile (WMF) from another application and retain its group properties in the iFIX WorkSpace, do not use the right-click Cut and Paste options. If you do, the pasted object will not be a grouped object, and instead will be a flat Bitmap.
- To insert a WMF as grouped object, you can use Microsoft Excel . In Excel, use the Insert menu to insert the WMF picture into a new spreadsheet. Right-click the picture and select Edit Picture. A message box appears requesting that you convert the picture to a Microsoft drawing object. Click Yes, and then copy the converted object from Excel. In the iFIX WorkSpace, and select Paste > Paste Special. From the Paste Special dialog box, select Enhanced Metafile and click OK. The grouped object should now appear in your picture.

#### Renaming Objects

► **To rename objects:**

1. In the iFIX WorkSpace system tree, right-click the object and choose Property Window. The Properties dialog box appears.
2. Place the cursor in the second column of the Name row and enter a name.

**Rotating Objects**

► **To rotate an object:**

1. In the iFIX WorkSpace, right-click the object you want to rotate and choose Rotate from the pop-up menu that appears.
2. Click and drag one of the rotation handles in the direction that you want to rotate the object.

**Changing an Object's Center of Rotation**

► **To change an object's center of rotation:**

1. In the iFIX WorkSpace, right-click the object you want to rotate and choose Rotate from the pop-up menu that appears.
2. Click and drag the object's center of rotation and move it to the desired location in your picture. The cursor becomes a crosshair.
3. To relocate the object's original center of rotation, click the current center of rotation and move it to the crosshair that appears inside the object.

**Reshaping Objects**

► **To reshape an object:**

1. In the iFIX WorkSpace, select the object. Reshape handles appear around the object.
2. Click and drag a reshape cursor. As you drag, the object changes shape.

**Setting the Fade Type of an Object**

► **To set the fade type of an object:**

1. In the iFIX WorkSpace, right-click the object, point to Color, and choose Fade.
2. In the Fade Type area, select the fade type you want to apply to the object.  
- Or -  
If the object already has a gradient style applied to it, right-click the object, point to Fade Type and choose the fade type you want to apply.

**NOTE:** Selecting a fade type in the Select FadeColor dialog box automatically sets the object's fill style to Gradient, regardless of the setting in the User Preferences dialog box.

#### Setting the Gradient Angle of an Object's Fade Type

► **To set the gradient angle of an object's fade type:**

1. In the iFIX WorkSpace, right-click the object, point to Color, and choose Fade. The Select FadeColor dialog box appears.
2. Move the Gradient Angle slider to change the angle of the gradient. The gradient angle moves around the shape in a counter-clockwise direction, starting from the right side of the shape, as you increase the angle.

**NOTE:** Changing the gradient angle has no effect on a radial or concentric fade type. Gradient angle applies only to the linear and reflected fade types.

3. Click OK.

#### Extending Lines to Intersect

► **To extend a line to intersect with another line:**

1. In the iFIX WorkSpace, control-click the lines you want to intersect with each other.
2. In Classic view, on the CAD Toolbar, click the Extend Lines button.

-Or-

In Ribbon view, on the Format tab, in the Picture group, click Drawing Tools, and then click Extend Lines.

#### Trimming Intersected Lines

► **To trim lines at the intersection point:**

1. In the iFIX WorkSpace, control-click the intersected lines you want to trim.
2. In Classic view, on the CAD Toolbar, click the Trim Lines button.

-Or-

In Ribbon view, on the Format tab, in the Picture group, click Drawing Tools, and then click Trim Lines.

#### Making Lines Horizontal or Vertical

► **To make lines horizontal:**

1. In the iFIX WorkSpace, control-click the lines you want to make horizontal.
2. In Classic view, on the CAD Toolbar, click the Make Lines Horizontal button.

-Or-

In Ribbon view, on the Format tab, in the Picture group, click Drawing Tools, and then click Make Lines Horizontal.

► **To make lines vertical:**

1. In the iFIX WorkSpace, control-click the lines you want to make vertical.
2. In Classic view, on the CAD Toolbar, click the Make Lines Vertical button.

-Or-

In Ribbon view, on the Format tab, in the Picture group, click Drawing Tools, and then click Make Lines Vertical.

#### Converting Lines to Polylines

► **To convert lines to a polyline:**

1. In the iFIX WorkSpace, control-click the lines you want to convert to a polyline.
2. In Classic view, on the CAD Toolbar, click the Convert Lines to Polyline button.

-Or-

In Ribbon View, on the Format tab, in the Picture group, click Drawing Tools, and then click Convert Lines to Polyline.

#### Converting Lines and Polylines to Pipe

► **To convert multiple lines and polylines to pipes:**

1. In the iFIX WorkSpace, control-click the lines or polylines you want to convert to pipes.
2. In Classic view, on the CAD Toolbar, click the Convert Lines and Polylines to Pipe button.

-Or-

In Ribbon view, on the Format tab, in the Picture group, click Drawing Tools, and then click Convert Lines and Polylines to Pipe.

► **To convert a single line or polyline to a pipe:**

In the iFIX WorkSpace, right-click the line or polyline you want to convert to a pipe and choose Convert to Pipe.

#### Modifying Pipe Characteristics

► **To modify pipe characteristics:**

1. In the iFIX WorkSpace, select the pipe object(s) you want to modify.
2. In Classic view, on the CAD Toolbar, click the Modify Pipe button.

- Or -

In Ribbon view, from the Format tab, in the Styles group, in the Pipe list, click Modify Pipe Characteristics.

- Or -

Right-click a single pipe, and choose Modify Pipe Characteristics.

- Or -

Right-click the single pipe, point to Color, and choose Fade.

- Or -

Control-click multiple pipes and in Classic View, click the Modify Pipe button on the CAD toolbar. In Ribbon view, from the Format tab, in the Styles group, in the Pipe list, click Modify Pipe Characteristics.

**NOTE:** The changes you make are applied to all of the selected pipe objects.

3. Change the pipe characteristics, as required.

**Adding and Deleting Connection Points**

► **To add a connection point:**

1. In the iFIX WorkSpace, select the shape object you want to add connection points to.
2. In Classic view, on the CAD Toolbar, click the Add Connection Point button.

-Or-

In Ribbon view, on the Format tab, in the Picture group, click Drawing Tools, and then click Add Connection Point.

3. Add the required connection points to the shape object.

**NOTE:** If the Always Show Connection Nodes check box on the User Preferences dialog box is selected, the default connection points and points that you add to shapes are always visible. If this check box is cleared, the connection points are not visible, but can be displayed either when you select a connector and move it towards the shape to anchor it to a certain connection point on the shape, or, in Classic view, by selecting the shape and clicking either the Add Connection Point button or Delete Connection Point button on the CAD Toolbar. In Ribbon view, select the shape and on the Format tab, in the Picture group, in the Drawing Tools list, click either Add Connection Point or Delete Connection Point.

► **To delete a connection point:**

1. In the iFIX WorkSpace, select the shape object you want to delete connection points from.
2. In Classic view, on the CAD Toolbar, click the Delete Connection Point button.

-Or-

In Ribbon View, on the Format tab, in the Picture group, click Drawing Tools, and then click Delete Connection Point.

3. Delete the connection points, as required.

#### **Adding and Anchoring Connectors to Shapes**

##### **► To add and anchor a connector to shapes:**

1. In Classic view, in the iFIX WorkSpace, on the CAD Toolbar, click the line connector button you want to use to connect your shapes.

-Or-

In Ribbon view, on the Insert tab, in the Connectors group, click Connectors, and then click the desired line connector.

You can choose from the Line Connector Tool, the Right Angle Line Connector, or the Pipe Connector.

2. Draw a connector between two shapes.
3. Select the connector. The ends of the connector change to green squares.
4. Drag the end of the connector to the connection point. The connector end changes to a red square when it is anchored to the connection point. If it is not anchored to the connection point, it stays green.

**NOTE:** When you are anchoring a connector object, it is automatically sent to the back of the object you are anchoring it to. The connector handles, however, are still visible and can be selected and moved. When the anchoring process is completed, you can right-click the connector object and choose Bring to Front.

5. Repeat steps 3 and 4 to anchor the connector to the second shape. The shapes can be moved around the picture but remain connected. The connector stretches and reshapes as the shapes are moved.

#### **Adding Points to Polygons and Polylines**

##### **► To add a point to a polygon or polyline:**

1. In the iFIX WorkSpace, right-click the polygon or polyline and choose Add Point.
2. Position the cursor between two of the object's points. Make sure the cursor is black or partially black.
3. Click the mouse to add the new point.

#### **Deleting Points from Polygons and Polylines**

► **To delete a point from a polygon or polyline:**

1. In the iFIX WorkSpace, right-click the polygon or polyline and choose Delete Point.
2. Position the cursor over the point you want to delete. Make sure the cursor is black.
3. Click the mouse to delete the point.

**Splitting Polylines and Pipes**

► **To split a polyline:**

1. In the iFIX WorkSpace, right-click the polyline you want to split and choose Split Polyline. The cursor becomes a splitting cursor. When you are close to the polyline, the splitting cursor changes to black.
2. Click the spot on the polyline where you want to split it. New reshape handles appear on one piece of the split polyline. You can use these handles to reshape the polyline or move it to a new location in the picture.

**NOTE:** When you split a polyline or pipe, you create a new object. Therefore, if you undo a polyline or pipe split, the new object is deleted first and you must perform a second undo action to revert to the original object.

► **To split a pipe:**

1. In the iFIX WorkSpace, right-click the pipe you want to split and choose Split Pipe. The cursor becomes a splitting cursor. When you are inside the edges of the pipe, the splitting cursor changes color.
2. Click the spot on the pipe where you want to split it. New reshape handles appear on one piece of the split pipe. You can use these handles to reshape the pipe or move it to a new location in the picture.

**NOTE:** When you split a polyline or pipe, you create a new object. Therefore, if you undo a polyline or pipe split, the new object is deleted first and you must perform a second undo action to revert to the original object.

**Selecting an Object's Color or Style Property**

► **To select an object's color or style property:**

In the iFIX WorkSpace, right-click the object and do one of the following:

- Select the desired property from the pop-up menu.
- Select Property Window from the pop-up menu and enter a property value in the second column of the Properties Window.

**Selecting Multiple Objects**

► **To select multiple objects:**

1. In the iFIX WorkSpace, select an object.
2. Control-click the remaining objects. Each selected object displays with handles.

**Aligning Two or More Objects to Each Other**

► **To align two or more objects to each other:**

1. In the iFIX WorkSpace, control-click the objects you want to align.
2. In Classic view, on the Tools toolbar, click the appropriate Align button.

-Or-

In Ribbon view, on the Format tab, in the Arrange group, click Align, and then click the desired alignment type.

-Or-

If the Toolbox is enabled, click the button on the Toolbox.

The objects align according to your selection.

**Spacing Three or More Objects**

► **To space three or more objects:**

1. In the iFIX WorkSpace, control-click the objects.
2. In Classic view, on the Tools toolbar, click the Space Evenly Vertical or Space Evenly Horizontal button.

-Or-

In Ribbon view, on the Format tab, in the Arrange group, click Space Evenly, and then click Space Evenly Vertical or Space Evenly Horizontal.

-Or-

If the Toolbox is enabled, click the button on the Toolbox.

The objects are spaced according to your selection.

**Sending Objects in Back of Other Objects**

► **To send an object in back of another object:**

1. In the iFIX WorkSpace, select the object.
2. In Classic view, on the Tools toolbar, click the Send to Back button.

-Or-

In Ribbon view, on the Format tab, in the Arrange group, click Send to Back.

-Or-

If the Toolbox is enabled, click the button on the Toolbox.

The selected object is positioned behind other objects.

#### **Bringing Objects to the Front of Other Objects**

► **To bring an object in front of another object:**

1. In the iFIX WorkSpace, select the object.
2. In Classic view, on the Tools toolbar, click the Bring to Front button.

-Or-

In Ribbon view, on the Format tab, in the Arrange group, click Bring to Front.

-Or-

If the Toolbox is enabled, click the Bring to Front button on the Toolbox.

The selected object is positioned in front of other objects.

#### **Making Multiple Objects the Same Size**

► **To make multiple objects the same size:**

1. In the iFIX WorkSpace, select any objects you want to resize.
2. Select the object you want to use to specify the size. All previously selected objects will be resized to match this object's size.
3. In Classic view, on the Format menu, select Make Same Size and then Select Height, Width, or Both, depending on which dimensions you want to change in the objects.

-Or-

In Ribbon view, on the Format tab, in the Arrange group, click Make Same Size, and then click desired option.

#### **Viewing Tag Status Pictures**

► **To view a single Tag Status picture:**

1. In the iFIX WorkSpace run-time environment, select the object you want to view the Tag Status picture for.
2. Right-click the object and choose Tag Status. The Tag Status picture appears.

► **To view a Tag Status picture from the Tag Control Panel picture:**

1. In the iFIX WorkSpace run-time environment, select the object(s) you want to view Tag Status pictures for.
2. Right-click the objects and choose Tag Status. Another menu appears listing the first tag found and the Tag Control Panel item.  
**NOTE:** When you select multiple objects, the first associated tag of the first object selected is displayed in the right-click menu.
3. Choose Tag Control Panel. The Tag Control Panel picture appears.
4. Click the Tag Status button for the Tag Status picture you want to view.

► **To view a Quick Trend chart from a Tag Status picture:**

1. In the iFIX WorkSpace run-time environment, select the object you want to view Tag Status picture for.
2. Right-click the object and choose Tag Status. The Tag Status picture appears.
3. Click the Quick Trend chart to select it, then right-click and choose Quick Trend. The Quick Trend picture for the tag appears.

**NOTE:** Only tags that have an F\_CV field associated with it will display a Quick Trend chart in the Tag Status picture.

#### **Viewing Quick Trend Pictures**

► **To view a Quick Trend picture:**

1. In the iFIX WorkSpace run-time environment, select the object you want to view the Quick Trend picture for.
2. Right-click the object and choose Quick Trend. The Quick Trend picture appears, displaying up to eight pens for the associated database tags.

**NOTE:** You can also select multiple objects and view a single Quick Trend picture for up to eight tags.

► **To view a Quick Trend picture from the Tag Control Panel picture:**

1. In the iFIX WorkSpace run-time environment, select the object(s) you want to view Quick Trend pictures for.
2. Right-click the objects and choose Tag Status. Another menu appears listing the first tag found and the Tag Control Panel item.  
**NOTE:** When you select multiple objects, the first associated tag of the first object selected is displayed in the right-click menu.
3. Choose Tag Control Panel. The Tag Control Panel picture appears.
4. Click the Quick Trend button for the Quick Trend picture you want to view.

#### **Viewing Tag Control Panel Pictures**

► **To view a Tag Control Panel picture:**

1. In the iFIX WorkSpace run-time environment, select the object(s) you want to view a Tag Control Panel picture for.
2. Right-click the objects and choose Tag Status. Another menu appears listing the first tag found and the Tag Control Panel item.  
**NOTE:** When you select multiple objects, the first associated tag of the first object selected is displayed in the right-click menu.
3. Choose Tag Control Panel. The Tag Control Panel picture appears.
4. You can view Tag Status and Quick Trend pictures for the tags associated with the object(s) you selected, as well as other tag information.

► **To add a tag to a Tag Control Panel picture:**

1. In the Tag Control Panel picture, click the Add Row button. The Expression Builder appears with only the FIX Database tab available.
2. Use the Expression Builder to create a tag whose information you want to view.
3. Click OK on the Expression Builder. The tag is added to the list on the Tag Control Panel picture.

► **To delete a tag from a Tag Control Panel picture:**

In the Tag Control Panel picture, select the tag you want to delete and click the Delete Selected Row(s) button.

**NOTE:** A tag that is associated with an object is removed only from the Tag Control Panel picture; it is not removed from the object.

**Saving Tag Lists in a Tag Control Panel Picture**

► **To save a tag list in the Tag Control Panel picture:**

1. In the Tag Control Panel picture in WorkSpace's runtime environment, select the tags you want to save to a tag list, by holding down the Control key and clicking each row you want to include in the list.
2. Click the Save Tag List button. The Save As dialog box appears.
3. Save the tag list to the location you want.

**Loading Tag Lists in a Tag Control Panel Picture**

► **To load a tag list in the Tag Control Panel picture:**

1. In the Tag Control Panel picture in WorkSpace's runtime environment, click the Load Tag List button. The Open dialog box appears.

2. Locate the tag list you want to load and click Open. The tag list you selected is displayed in the Tag Control Panel picture, overwriting the current list.

#### Configuring the Global Time Control

##### ► To configure the Global Time Control:

1. In Ribbon view, in run mode, click the Historical tab, and then click Configuration. The Global Time Control dialog box appears.
2. In the Time Definition area, enter the Start Time.
3. Either choose an End Time or define the Duration of the display:
  - To set the End Time, in the End Time area, enter a date.
  - To set the Duration:
    - a. Select the Define Duration check box.
    - b. In the Days list, select the number of days.
    - c. Select the number of hours, minutes and seconds in their respective lists.
4. In the Historical Update Rate area, select the number of hours, minutes, and seconds from their respective list, for the update rate. This function does not apply for Playback.
5. In the Scroll Rates area, either set the scroll rate as a percentage of the duration or as a fixed amount. This function does not apply for Playback.
  - To set the scroll rate as a percentage of the duration:
    - a. Select Scroll as % of Duration check box.
    - b. In the Slow list, enter a value for the slow scroll speed.
    - c. In the Fast list, enter a value for the fast scroll speed.
  - To set the scroll rate as a fixed amount:
    - a. If necessary, clear the Scroll as % of Duration check box.
    - b. In the Slow area, select the unit of measurement: days, hours, minutes, or seconds.
    - c. Enter the value for the unit selected.
    - d. In the Fast area, select the unit of measurement: days, hours, minutes, or seconds.
    - e. Enter the value for the unit selected.
6. To allow for playback (does not apply to Historian Update or Scroll Rate), select the Enable Playback option. In the Playback area, select either By Speed or By Frame Size and the setting.
7. Click OK to apply changes to all open pictures.

#### Hiding the Historical Datalink Timestamp

► **To hide the historical datalink time stamp for all historical datalinks:**

**NOTE:** The following procedure applies only to historical datalinks created after you perform this procedure. Existing historical datalinks will not be affected.

1. In Classic view, in the iFIX WorkSpace, from the WorkSpace menu, select User Preferences.

-Or-

In Ribbon view, on the Home tab, in the WorkSpace group, click Settings, and then click User Preferences.

2. Click the Shape Preferences tab.
3. In the Historical Datalink area, clear the Show Timestamp With Data check box.

► **To hide the historical datalink time stamp for a single historical datalink:**

**Method 1**

1. Double-click the historical datalink. The Historical Datalink dialog box appears.
2. Clear the Show Timestamp With Data check box.
3. Click OK.

**Method 2**

1. From the right-mouse menu of the historical datalink, select Property Window. The Property Window appears.
2. For the ShowTimeStamp property, select False.

## Working with Standard Charts

In the iFIX WorkSpace, you can perform the following steps with charts:

- [Applying Properties to all Pens in a Chart](#)
- [Adding a Pen to a Chart](#)
- [Selecting a Historical Mode for a Pen](#)
- [Naming a Chart](#)
- [Entering a Chart Description](#)
- [Attributing a Help Context ID](#)
- [Changing the Refresh Rate](#)
- [Changing the Order of the Information in the Legend](#)

### Applying Properties to all Pens in a Chart

► To apply properties to all pens in a chart:

1. In the iFIX WorkSpace, double-click the chart.
2. Click the Chart tab, then click the tab containing the properties you want to select.
3. Select the appropriate properties on the tabbed page.
4. Select the Apply to All Pens check box and then click OK.

## Adding a Pen to a Chart

► To add a pen to your chart:

1. In the iFIX WorkSpace, double-click the chart.
2. Click on the Chart tab.
3. In the Pen List area, click the Add Pen button, or click a blank area in the Pen List, and do one of the following:
  - Enter a data source using the *Data Server.NODE.TAG.FIELD* format.
  - Select a data source from the drop-down list.
  - Click the Browse button and select a data source from the Expression Builder.

## Selecting a Historical Mode for a Pen

► To select a historical mode for a pen:

1. In the iFIX WorkSpace, double-click the chart.
2. Click the Chart tab, and then click the Pen tab.
3. In the Pen List, select a historical data source.
4. In the Style area, select a historical mode from the Historical Mode field.

## Naming a Chart

► To name a chart:

1. In the iFIX WorkSpace, double-click the chart.
2. Click the General tab and, in the Name field, enter a name for the chart.
3. Click OK.

## Entering a Chart Description

► To enter a chart description:

1. In the iFIX WorkSpace, double-click the chart.
2. Click the General tab and, in the Description field, enter a chart description.
3. Click OK.

## Attributing a Help Context ID

► To attribute a help context ID:

1. In the iFIX WorkSpace, double-click the chart.
2. Click the General tab and, in the Help Context Id field, enter a context-sensitive help ID.
3. Click OK.

## Changing the Refresh Rate

► To change the refresh rate:

1. In the iFIX WorkSpace, double-click the chart.
2. Click the General tab and, in the Refresh Rate field, choose a refresh rate in seconds.
3. Click OK.

## Changing the Order of the Information in the Legend

► To change the order of the information in the legend of a chart:

1. In the iFIX WorkSpace, double-click the chart.
2. Click the Chart tab, then click the Legend tab.
3. In the Order area, select the information you want and click the up or down button to change its order in the legend (left to right). For example, if you want to display the data source value first, select Value and click the up arrow button until Value is listed first.
4. Click OK.

## Working with Enhanced Charts

In the iFIX WorkSpace, you can customize your enhanced charts using the following procedures:

- [Adding a Chart Description to Enhanced Charts](#)
- [Adding a Data Source Legend to an Enhanced Chart](#)
- [Adding a Plotting Style Legend to an Enhanced Chart](#)
- [Adding a Title to an Enhanced Chart](#)
- [Changing the Plotting Color and Style of an Enhanced Chart](#)
- [Changing the Chart Refresh Rate for an Enhanced Chart](#)
- [Choosing a Border Style for an Enhanced Chart](#)
- [Choosing Subsets for Enhanced Line Charts](#)
- [Configuring Data Sources for Enhanced Charts](#)
- [Configuring the X and Y Axis of an Enhanced Chart](#)
- [Customizing Enhanced Chart Grid Lines](#)
- [Customizing the Color and Look of Enhanced Charts](#)
- [Customizing the Data Source Legend for an Enhanced Chart](#)

- [Defining Run-time Attributes for Enhanced Charts](#)
- [Displaying Milliseconds on an Enhanced Chart](#)
- [Exporting Enhanced Chart Data](#)
- [Extending the Y Axis Ticks on an Enhanced Chart](#)
- [Naming an Enhanced Chart](#)
- [Removing the Plotting Style Legend from an Enhanced Chart](#)
- [Removing the Data Source Legend from an Enhanced Chart](#)
- [Selecting the Font Size and Type for an Enhanced Chart](#)
- [Setting Numeric Precision for Enhanced Charts](#)
- [Setting the Data Display Format for Enhanced Charts](#)
- [Showing Data Points on an Enhanced Chart](#)
- [Showing the Time Cursor in Enhanced Charts](#)

## **Adding a Chart Description to Enhanced Charts**

► To add a chart description to an enhanced chart:

1. In the iFIX WorkSpace picture, double-click the chart. The Enhanced Chart Customization dialog box appears.
2. Click the General tab and in the Description field, enter a chart description.
3. Click OK.

## **Adding a Data Source Legend to an Enhanced Chart**

► To add a data source legend to an enhanced chart:

1. In the iFIX WorkSpace picture, double-click the chart. The Enhanced Chart Customization dialog box appears.
2. Click the Chart Style tab and in the Miscellaneous area, select Show Data Source Legend.
3. Click OK.

## **Adding a Plotting Style Legend to an Enhanced Chart**

► To add a plotting style legend to an enhanced chart:

1. In the iFIX WorkSpace picture, double-click the chart. The Enhanced Chart Customization dialog box appears.
2. Click the Chart Style tab and in the Miscellaneous area, select Show Plotting Style Legend.
3. Click OK.

## **Adding a Title to an Enhanced Chart**

► To add a title to an enhanced chart:

1. In the iFIX WorkSpace picture, double-click the chart. The Enhanced Chart Customization dialog box appears.
2. Click the General tab, and in the Main Title field, enter a title for the chart.
3. Optionally, in the Subtitle field, enter a subtitle for the chart.
4. Click OK.

## Changing the Plotting Color and Style of an Enhanced Chart

► To change the plotting color and style of an enhanced chart:

1. In the iFIX WorkSpace picture, double-click the chart. The Enhanced Chart Customization dialog box appears.
2. Click the Plotting Style tab and in the Line Style area, click the desired color. To create a custom color, double-click a color.  
**NOTE:** The selected color is applied to the X and Y axis markers, Data Sources table items, and graph lines and points.
3. Line Charts Only: In the Chart Plotting Style area, select the desired style.
4. Line Charts Only: Select a Point Type.

**NOTE:** Point types appear only if the Chart Plotting Style includes points, such as Point + Line, for example.

5. Select a Line Type.
6. In the Data Shadows area, click Off, Shadow, or 3D.  
**NOTE:** 3D can be applied only to Histograms; Shadow can be applied to only Histograms and Line/Multiline charts that use Area or Bar for their Plotting Style.
7. Click OK.

## Changing the Chart Update Rate for an Enhanced Chart

► To change the chart update rate of an enhanced chart:

1. In the iFIX WorkSpace picture, double-click the chart. The Enhanced Chart Customization dialog box appears.
2. Click the General tab and, in the Chart Update Rate field, enter a refresh rate in seconds.
3. Click OK.

## Changing the Y Axis Style in Run Mode

**NOTES:**

- Two or more data sources must be configured in order to display multiple charts or a stacked chart.
- The Enable Quick Configure check box must be selected in the General tab of the Chart Customization dialog box.

► To change the Y axis style:

1. In run mode, hover over the upper left corner of the chart. Buttons labeled Multiple, Stack, and Single appear.
2. Click the button corresponding to the Y axis style you want to display.

### Changing the Y Axis Visibility in Run Mode

**NOTE:** The Enable Quick Configure check box and the Selectable check box must both be selected in the General tab of the Chart Customization dialog box.

► To change the Y axis visibility:

1. In run mode, hover over the column at the far right of the Data Source Legend area under the chart. The Y Axis Always Visible label box appears just above the cursor.
2. Click the value (Yes or No) displayed for the row to toggle it to the opposite value.

### Changing the Plot Visibility in Run Mode

**NOTE:** The Enable Quick Configure check box and the Selectable check box must both be selected in the General tab of the Chart Customization dialog box.

► To change the plot visibility:

1. In run mode, hover over the second column from the far right of the Data Source Legend area under the chart. The Plot Visible label box appears just above the cursor.
2. Click the value (Yes or No) displayed for the row to toggle it to the opposite value.

### Choosing a Border Style for an Enhanced Chart

► To choose a border style for an enhanced chart:

1. In the iFIX WorkSpace picture, double-click the chart. The Enhanced Chart Customization dialog box appears.
2. Click the Chart Style tab and in the Border Style area, click the desired border style.
3. Click OK.

### Choosing Subsets for Enhanced Line Charts

► To choose the subsets for an enhanced line chart:

1. In the iFIX WorkSpace picture, double-click the chart. The Enhanced Chart Customization dialog box appears.
2. Click the Subsets tab and in the Scrolling Subsets area, choose the number of subsets to view in one group.

3. To add a subset to a graph select it from the Baseline Subsets to Graph list.
4. Click OK.

## Configuring Data Sources for Enhanced Charts

► **To configure data sources for an enhanced chart:**

1. In the iFIX WorkSpace picture, double-click the chart. The Enhanced Chart Customization dialog box appears.
2. Click the Data Sources tab and in the Data Sources List do one of the following:
  - Enter a data source using the *Data Server.NODE.TAG.FIELD* format.
  - Select a data source from the drop-down list.
  - Click the Browse button and select a data source from the Expression Builder.
3. To use the data range of the data source, on the Data tab, if it is not already selected, click Fetch Limits.
4. To set the data range yourself, clear the Fetch limits check box and enter the upper limit of the range in the High Limit field and enter the lower limit of the range in the Low Limit field.
5. For Line/Multiline charts only: Enter the maximum number of display points in the Maximum Display Points field.
6. To cause gaps to appear on the chart if they are present in the data, select Show Gaps.
7. To use interpolated data, select Interpolated Data.
8. Historical Data Charts only: Choose a mode from the Historical Mode list.
9. Configure the time parameters for historical data sources on the Time tab.

**NOTE:** The Time tab is available only for historical data sources.

- a. In the Start Date section, select either Fixed Date or Days Before Now and enter the desired date or value.
  - b. In the Start Time section, select either Fixed Time or Duration Before Now and enter the desired time or value.
  - c. Optionally, to configure the chart to open at the Fixed Time and to ignore changes to the time zone in the Date and Time Properties dialog box in the Control Panel, select Lock Time.
  - d. Optionally, to adjust for daylight saving time, if it is not already selected, click Adjust for Daylight Savings Time and select a time zone from the Time Zone list.
  - e. To apply all of the preceding settings to all historical data sources, select Apply To All Data Sources, and then click Apply.
10. Click OK.

## Configuring the X and Y Axis of an Enhanced Chart

► To configure the X and Y axis of an enhanced chart:

1. In the iFIX WorkSpace picture, double-click the chart. The Enhanced Chart Customization dialog box appears.
2. Click the Axis tab and in the X Axis Title field, enter a title for the X axis.
3. In the Y Axis Title field, enter a title for the Y axis.
4. In the Show X-Axis field, select the Grid, Labels, and Title to be displayed for the X axis.
5. In the Show Y-Axis field, select the Grid, Labels, and Title to be displayed for the Y axis.
6. In the Max X-Axis Labels field, select the maximum number of labels (up to 20) to be displayed for the X axis.
7. Line/Multiline Charts only: Select Linear or Log format for the Y axis units.
8. To use automatically generated limits for the Y axis, select Use Data Source Limits.
9. To specify which values you want to set for the Y axis, clear the Use Data Source Limits check box and select Min, Max, or Min/Max.
10. Enter the desired value in the Min and/or Max fields.
11. Select Auto if you want the chart to dynamically resize to the values plotted.  
**NOTE:** Auto is available only if Use Data Source Limits is selected.
12. In the Padding field, enter a value.
13. On the Chart Style tab, in the X Axis Label Orientation area, click the orientation of the X axis.
14. Click OK.

## Configuring Multiple Y Axes for Enhanced Charts

► To configure multiple Y axes for Enhanced Charts:

1. In the iFIX WorkSpace picture, double-click the chart. The Enhanced Chart Customization dialog box appears.
2. Click the Chart Style tab. In the Y Axes Style area, select either Multiple Axes or Stack Axes.
3. Click the Data Sources tab and click the Y Axis sub-tab.
4. From the Data Sources List area, select the data source to configure a Y axis for.
5. In the Title field in the Y Axis tab, enter a title for the Y axis of the selected data source.
6. If you want the Y axis for this data source to always be visible, select the Y Axis Always Visible check box.
7. If you want to use the default Y axis settings configured in the Axis tab, select the Use Default Y Axis Settings check box.  
**NOTE:** Selecting this option disables all other controls in this group.
8. If you want the Y axis for this data source to be set according to the limits of the individual data source, select the Use Data Source Limits check box.

**NOTES:**

- This option is available only if Use Default Y Axis Settings is not selected.
  - Selecting this option disables all other Data Source Limits controls in this group.
9. Select Linear or Log format to specify whether the Y Axis legend for the associated data source is displayed in a linear or logarithmic style
- NOTE:** This option is available only if Use Default Y Axis Settings is not selected.
10. To specify minimum and/or maximum values for the Y axis in run mode either manually or automatically, select either Auto, Min, Max, or Min/Max in the radio button group.
- Auto allows iFIX to automatically calculate the minimum and maximum values so that all data points are within the visible area of the chart for the selected data source.
  - Min allows you to specify the minimum value and automatically calculate the maximum value for the selected data source.
  - Max allows you to specify the maximum value and automatically calculate the minimum value for the selected data source.
  - Min/Max allows you to specify both the minimum and maximum values for the selected data source.

**NOTE:** These options are not available if Use Default Y Axis Settings or Use Data Source Limits is selected.

11. To manually specify the minimum and/or maximum values for the Y axis, enter the values in the Min and/or Max fields.

**NOTES:**

- The Min and Max fields are not available if Use Default Y Axis Settings or Use Data Source Limits is selected.
- The Min field is available only if the Min or Min/Max radio button is selected.
- The Max field is available only if the Max or Min/Max radio button is selected.

12. To specify the spacing between values and the top and bottom of plot area, enter the desired value in the Padding field.

**NOTES:**

- This option is not available if the Min/Max radio button is selected.
- This option is not available if Use Default Y Axis Settings or Use Data Source Limits is selected.

13. To configure the Y axis for another data source in the Data Sources List area, repeat the preceding steps.

## Customizing Enhanced Chart Grid Lines

► **To customize enhanced chart grid lines:**

1. In the iFIX WorkSpace picture, double-click the chart. The Enhanced Chart Customization dialog box appears.
2. Click the Chart Style tab and in the Grid Lines area, click Grid in Front of Data to make the grid lines appear in front of the data.

3. Click which, if any, grid lines you want to display on the chart.
4. Click the desired style for the grid lines.
5. Click OK.

## **Customizing the Color and Look of Enhanced Charts**

► **To customize the color and look of an enhanced chart:**

1. In the iFIX WorkSpace picture, double-click the chart. The Enhanced Chart Customization dialog box appears.
2. Click the Color tab and in the Viewing Style area, select Color, Monochrome, or Monochrome + Symbols.
3. To design your own custom color graph:
  - a. In the Graph Attributes area, click the attribute you want to change the color for.
  - b. Click the desired color for the selected attribute. To create a custom color, double-click a color.
  - c. Repeat steps a and b until you have modified all desired attributes.
4. To use a pre-set style:
  - a. Select Bitmap/Gradient Styles.
  - b. Click the desired Bitmap/Gradient style.
5. Click OK.

## **Customizing the Data Source Legend for an Enhanced Chart**

► **To customize the data source legend for an enhanced chart:**

1. In the iFIX WorkSpace picture, double-click the chart. The Enhanced Chart Customization dialog box appears.
2. Click the Data Sources tab and then the Legend tab.
3. In the Items area, select the items that you want to appear in the data sources Legend.
4. To apply your selections to all data sources, select Apply To All Data Sources.
5. To change the order in which the selected items appear, on the Chart Style tab, in the Legend Column Width area, in the Order list, select the item you want to move. Use the Up arrow to move the item's location to the right or the Down arrow to move the item's location to the left.
6. To change the width of a data source legend column, in the Legend Column Width area, enter the desired column width in the corresponding column field. For example, to change the width of the Source column of the data source legend, enter the desired width in the Source field.
7. In the Miscellaneous area, select Show Data Source Legend.
8. Click OK.

## **Defining Run-time Attributes for Enhanced Charts**

► To define run time attributes for enhanced charts:

1. In the iFIX WorkSpace picture, double-click the chart. The Enhanced Chart Customization dialog box appears.
2. Click the General tab.
3. Select the attributes (Highlightable, Selectable, Modifiable, Expandable), if any, you want to permit at run time.
4. In the Zooming area, select the desired zoom function.
5. In the Appearance area, select Enable Quick Configure to quickly and easily change various Enhanced Chart properties while in run mode without having to display the configuration dialog or the right-click menu.
6. Click OK.

## Displaying Milliseconds on an Enhanced Chart

► To display milliseconds on an enhanced charts:

1. In the iFIX WorkSpace picture, double-click the chart. The Enhanced Chart Customization dialog box appears.
2. Click the General tab and in the Appearance area, select Display Milliseconds.
3. Click OK.

## Enabling Advanced Graphics

► To enable advanced graphics for an enhanced chart:

1. In the iFIX WorkSpace picture, double-click the chart. The Enhanced Chart Customization dialog box appears.
2. Click the General tab and in the Appearance area, select Enable Advanced Graphics.
3. Click OK.

## Enabling Quick Configure

Enable Quick Configure provides a way to quickly and easily change chart properties while in run mode without needing to open the configuration dialog box or use the right-click menu. The Quick Configure options that are enabled are:

- Y Axes Style buttons (Multiple, Stack, Single) that appear when you hover over the upper left-hand corner of the chart
- Y Axis Always Visible toggle when you hover over the column at the far right of the Data Source Legend area under the chart
- Plot Visible toggle when you hover over the second column from the far right of the Data Source Legend area under the chart

**NOTE:** The Selectable check box on the General tab must also be selected to toggle the Y Axis Always Visible and Plot Visible properties between Yes and No.

► To enable quick configure for an Enhanced Chart:

1. In the iFIX WorkSpace picture, double-click the chart. The Enhanced Chart Customization dialog box appears.
2. Click the General tab and in the Appearance area, select Enable Quick Configure.
3. Click OK.

## Enabling the Thumbnail View

The Thumbnail check box allows the chart to be reduced to thumbnail size while still being legible enough to provide useful information. When coupled with the Expandable property, the chart can be enlarged to full size in run mode, or can be reduced to thumbnail size.

► To enable thumbnail view:

1. In the iFIX WorkSpace picture, double-click the chart. The Enhanced Chart Customization dialog box appears.
2. Click the Chart Style tab and in the Miscellaneous area, select Thumbnail.
3. Click OK.

## Exporting Enhanced Chart Data

► To export enhanced chart data:

1. In the iFIX WorkSpace picture, double-click the chart. The Enhanced Chart Customization dialog box appears.
2. Click Export.
3. In the Export area, select the desired file format type.
4. In the Export Destination area, select the desired export location. If you chose File, click Browse to set the destination.
5. For Export options EMF, WMF, BMP, JPG, and PNG only, configure the export size. To do so:
  - a. If applicable, select the unit of measure.
  - b. Enter the export size in the Width fields.

**NOTE:** The width/height aspect ratio must be between .1 and 10.0 to avoid generating the error "This will produce an image that is hard to read. Please adjust output dimensions." For example, a width/height of 30/300 does not produce an error, but 30/301 does. Likewise, a width/height of 300/30 does not produce an error, but 301/30 does.

- c. Select the DPI.
- d. If desired, click Large Font.
2. Click Export. If you selected the EMF, WMF, BMP, JPG, or PNG formats for export, your data is exported. Otherwise, the Exporting Enhanced Chart dialog box appears.
3. On the Exporting Enhanced Chart dialog box, in the Export What area, select whether you want to export only the data or the data with its labels.

4. In the Export Style area, choose to export the data in either list or table format. If you chose List, in the Delimited area, select either Tab or Comma. If you chose Table, in the Row vs Column area, select either Subsets/Points or Points/Subsets.
5. In the Numeric Precision area, choose your level of precision.
6. Click Export.

## Extending the Y Axis Ticks on an Enhanced Chart

► To show the Y Axis ticks on an enhanced chart:

1. In the iFIX WorkSpace picture, double-click the chart. The Enhanced Chart Customization dialog box appears.
2. Click the Chart Style tab and in the Grid Lines area, select Extend Y Axis Ticks.
3. Click OK.

## Naming an Enhanced Chart

► To name an enhanced chart:

1. In the iFIX WorkSpace picture, double-click the chart. The Enhanced Chart Customization dialog box appears.
2. Click the General tab and, in the Object Name field, enter a name for the chart.
3. Click OK.

## Removing the Plotting Style Legend from an Enhanced Chart

► To remove the plotting style legend from an enhanced chart:

1. In the iFIX WorkSpace picture, double-click the chart. The Enhanced Chart Customization dialog box appears.
2. Click the Chart Style tab and in the Miscellaneous area, clear the Show Plotting Style Legend check box.
3. Click OK.

## Removing the Data Source Legend from an Enhanced Chart

► To remove the data source legend from an enhanced chart:

1. In the iFIX WorkSpace picture, double-click the chart. The Enhanced Chart Customization dialog box appears.
2. Click the Chart Style tab and in the Miscellaneous area, clear the Show Data Source Legend check box.
3. Click OK.

## Selecting the Font Size and Type for an Enhanced Chart

► To select the font size and type for an enhanced chart:

1. In the iFIX WorkSpace picture, double-click the chart. The Enhanced Chart Customization dialog box appears.
2. Click the Font tab and in the Chart Font Size area, select a size for the chart's fonts.
3. In the Font Styles area, select a font type for the Main Title, Sub-Title, Subset / Point / Axis Labels, and Table Data.
4. Optionally, select a font face for the Main Title, Sub-Title, Subset / Point / Axis Labels, and Table Data.

**NOTE:** To help you visualize how your choices look, an example is displayed in the Sample field.

5. Click OK.

## Setting Numeric Precision for Enhanced Charts

► To set the numeric precision for an enhanced chart:

1. In the iFIX WorkSpace picture, double-click the chart. The Enhanced Chart Customization dialog box appears.
2. Click the Chart Style tab and in the Numeric Precision area, select the desired level of precision.
3. Click OK.

## Setting the Data Display Format for Enhanced Charts

► To set the data display format for an enhanced chart:

1. In the iFIX WorkSpace picture, double-click the chart. The Enhanced Chart Customization dialog box appears.
2. Click the Chart Style tab and in the Display field, select the desired data display format.
3. Click OK.

## Showing Data Points on an Enhanced Chart

► To show data points on an enhanced chart (method 1):

1. In the iFIX WorkSpace picture, double-click the chart. The Enhanced Chart Customization dialog box appears.
2. Click the Plotting Style tab and in the Chart Plotting Style area, select a plotting style that includes "Points" in the name.
3. Select a Point Type for each data source.
4. Choose a color for each data source.
5. Click OK.

► To show data points on an enhanced chart (method 2):

1. In the iFIX WorkSpace picture, double-click the chart. The Enhanced Chart Customization dialog box appears.
2. Click the Chart Style tab and in the Miscellaneous area, select Mark Data Points.
3. Click OK.

## Showing the Data Points Labels in an XY Chart

► To show data points labels on an XY chart:

1. In the iFIX WorkSpace picture, double-click the chart. The Enhanced Chart Customization dialog box appears.
2. Click the Chart Style tab and in the Miscellaneous area, select Include Data Labels.
3. Click OK.

## Showing the Expand/Contract Button in Enhanced Charts

► To show the expand/contract button in an enhanced chart:

1. In the iFIX WorkSpace picture, double-click the chart. The Enhanced Chart Customization dialog box appears.
2. Click the General tab and select Expandable.
3. Click OK.

### NOTES:

- In run mode, moving the cursor to the upper right corner of the chart displays the Expand or Contract button. This button toggles the size of the chart between a smaller view and a larger view.
- The expand/contract feature can be used in conjunction with the Thumbnail feature if you want the smaller view to be thumbnail size with legible information available.

## Showing the Time Cursor in Enhanced Charts

► To show the time cursor in an enhanced chart:

1. In the iFIX WorkSpace picture, double-click the chart. The Enhanced Chart Customization dialog box appears.
2. Click the General tab and in the Appearance area, select Show Time Cursor, and select As Table or As Tool Tips for displaying the time cursor at run time.
3. Select the Selectable check box.
4. Click OK.

**NOTE:** In run mode, clicking in the plot area freezes the time cursor where clicked; clicking again frees the cursor.

## Showing the Hover Tool Tips in Enhanced Charts

► To show the hover tool tip in an enhanced chart:

1. In the iFIX WorkSpace picture, double-click the chart. The Enhanced Chart Customization dialog box appears.
2. Click the General tab and in the Appearance area, select Show Hover Tool Tip.
3. Select the Selectable check box.
4. Click OK.

## Working with the Alarm Summary Object

In the iFIX WorkSpace, you can perform the following steps with Alarm Summary objects:

- [Setting a SCADA Server's Alarm Priority](#)
- [Adding Alarm Summary Objects to a Picture](#)
- [Displaying the Object's Properties Window](#)
- [Changing the General Appearance](#)
- [Configuring Colors, Fonts, and Styles](#)
- [Filtering or Sorting Alarms](#)
- [Acknowledging Alarms](#)
- [Changing Default Settings](#)
- [Working with Run-Time Settings and Properties](#)

### Setting a SCADA Server's Alarm Priority

► To set a SCADA server's alarm priority:

1. In the iFIX WorkSpace configuration environment, open or create a picture.
2. In Classic view, from the Shapes toolbar, click the Data link button.  
-Or-  
In Ribbon view, on the Insert tab, in the Objects/Links group, click Objects/Links, and then click Datalink.  
-Or-  
If the Toolbox is enabled, click the Datalink button on the Toolbox.  
The cursor changes to a plus sign.
3. Click and drag the mouse to define the size of the Data link. The Datalink dialog box appears.
4. In the Source field, enter the data source Fix32.node.System.A\_SACPR.
5. From the Type drop down menu in the Data Entry area, select In-Place.
6. Complete the remainder of the Datalink dialog box.
7. Switch to the run-time environment and enter the SCADA server's alarm priority.

## **Adding Alarm Summary Objects to a Picture**

► **To add an Alarm Summary object to a picture:**

In Classic view, in the iFIX WorkSpace, from the Shapes toolbar, select the Alarm Summary button.

-Or-

In Ribbon view, on the Insert tab, in the Objects/Links group, click Objects/Links, and then click Alarm Summary.

-Or-

If the Toolbox is enabled, click the Alarm Summary button on the Toolbox.

## **Displaying the Object's Properties Window**

► **To display the object's Properties window:**

1. In the iFIX WorkSpace, right-click the object.
2. Select Property Window. The Properties window appears.

## **Displaying The Number of Occurrences of an Alarm Since Last Acknowledgement**

► **To display the number of occurrences of an alarm since last acknowledgement in an Alarm Summary object:**

1. In the iFIX WorkSpace, double-click the Alarm Summary object. The Alarm Summary Configuration dialog box appears.
2. Select the Column tab.
3. From the Available Columns list, double-click the user-defined field you want to add to the spreadsheet.
4. In the user-defined field, assign the A\_ALMOCCUR block field. In the user-defined field name, type a name for the column header.

## **Changing the General Appearance**

In the iFIX WorkSpace, you can perform the following steps to change the general appearance of your working area:

- [Blinking Unacknowledged Alarms](#)
- [Stop Blinking of Unacknowledged Alarms](#)
- [Changing the Alarm Summary Object's Columns](#)

- [Changing the Column Order](#)
- [Configuring User-Defined Fields](#)
- [Showing or Hiding Alarm Summary Object Controls](#)

#### Blinking Unacknowledged Alarms

► **To blink unacknowledged alarms:**

1. In the iFIX WorkSpace, double-click the Alarm Summary object. The Alarm Summary Configuration dialog box appears.
2. Select the Display tab.
3. Select Blink Unack Alarms.

#### Changing the Alarm Summary Object's Columns

► **To change the columns displayed by the Alarm Summary object:**

1. In the iFIX WorkSpace, double-click the Alarm Summary object. The Alarm Summary Configuration dialog box appears.
2. Select the Column tab.
3. Double-click the columns in the Available Columns box to add them to the object.
4. Double-click the columns in the Selected Columns box to remove them from the object.

#### Changing the Column Order

► **To change the column order:**

1. In the iFIX WorkSpace, double-click the Alarm Summary object. The Alarm Summary Configuration dialog box appears.
2. Select the Column tab.
3. Select the column you want to move from the Selected Columns box.
4. Click the up arrow button to move the column left in the spreadsheet.
5. Click the down arrow button to move the column right in the spreadsheet.

#### Configuring User-Defined Fields

► **To configure a user-defined field:**

1. In the iFIX WorkSpace, double-click the Alarm Summary object. The Alarm Summary Configuration dialog box appears.
2. Select the Column tab.
3. From the Available Columns list, double-click the user-defined field you want to add to the spreadsheet.
4. Enter a block field name you want to assign to the user-defined field in the User Definable Columns area and click the <> button. The maximum length of the field name is 50 characters.

**Showing or Hiding Alarm Summary Object Controls**

► **To show or hide column headings, scroll bars, row numbers, grid lines, or the status bar:**

1. In the iFIX WorkSpace, double-click the Alarm Summary object. The Alarm Summary Configuration dialog box appears.
2. Select the Display tab.
3. Select the check boxes of the items you want to display.
4. Clear the check boxes of the items you want to hide.

**Configuring Fonts, Colors, and Styles**

In the iFIX WorkSpace, you can perform the following steps with fonts, colors, and styles:

- [Configuring Fonts for the Column Headings and Status Bar](#)
- [Configuring Unacknowledged Alarm Colors](#)
- [Display Alarm Colors by Status or Priority](#)
- [Set the Background Color of Alarms to Blink](#)
- [Selecting an Alarm's Font and Style](#)
- [Selecting the Alarm Foreground Color](#)
- [Selecting the Alarm Background Color](#)

**Configuring Fonts for the Column Headings and Status Bar**

► **To configure fonts for the Alarm Summary column headings and status bar:**

1. In the iFIX WorkSpace, double-click the Alarm Summary object. The Alarm Summary Configuration dialog box appears.
2. On the General tab, in the Fonts area, click the browse (...) button next to either the Alarm Column Headings or Status bar field. The font dialog box appears.
3. Select the font name, style, size, and/or script that you want to use.

4. Optionally, repeat steps 2 and 3 for the other configurable field.
5. Click OK to accept your changes and close the Font dialog box.
6. In the Alarm Summary Configuration dialog box, click Apply.

#### Configuring Unacknowledged Alarm Colors

► **To configure the color for unacknowledged alarms:**

1. In the iFIX WorkSpace, double-click the Alarm Summary object. The Alarm Summary Configuration dialog box appears.
2. Select the Color tab.
3. Select the Unacknowledged Alarm Color check box to enable it.
4. Click the option's color button. The Select Color dialog box appears.
5. Select a color for unacknowledged alarms, then click OK.

#### Selecting an Alarm's Font and Style

► **To select an alarm's font and style:**

1. In the iFIX WorkSpace, double-click the Alarm Summary object. The Alarm Summary Configuration dialog box appears.
2. Select the Color tab.
3. In the Foreground Alarm Color area, next to the alarm priority or status, select the Font button.
4. Select the font and style from the dialog box that appears.

#### Setting the Alarm Foreground Color

► **To select the alarm foreground color:**

1. In the iFIX WorkSpace, double-click the Alarm Summary object. The Alarm Summary Configuration dialog box appears.
2. Select the Color tab.
3. Next to each alarm priority or status, double-click the color. The Select Color dialog box appears.
4. Select a new color for the alarm status or priority and then click OK.
5. Repeat the previous two steps for each row in the Foreground Alarm Color area.
6. If the Unacknowledged Alarm Color option is enabled, double-click the color next the field to define the unacknowledged alarm color.

7. Click Apply.

#### Selecting the Alarm Background Color

► **To select the alarm background color:**

1. In the iFIX WorkSpace, double-click the Alarm Summary object. The Alarm Summary Configuration dialog box appears.
2. Select the Color tab.
3. Next to each alarm priority or status, double-click the color. The Select Color dialog box appears.
4. Select a new color for the alarm and then click OK.
5. Repeat steps the previous two steps for each row in the Background Alarm Color area.
6. If the Blink to Color option is enabled, in the second column for each alarm priority or status, select a blinking color. Double-click the color in the second row to define the blink color.
7. Repeat the previous step for each row that you want to define a color for the blink feature.
8. Click Apply.

#### Filtering or Sorting Alarms

In the iFIX WorkSpace, you can perform the following steps with alarms:

- [Appending Filter Conditions](#)
- [Changing Boolean Operators](#)
- [Configuring Alarm Summary to Sort Alarms](#)
- [Creating Filter Conditions](#)
- [Deleting Filter Conditions](#)
- [Inserting Filter Conditions](#)
- [Modifying Filter Conditions](#)

#### Appending Filter Conditions

► **To append a filter condition:**

1. In the iFIX WorkSpace, double-click the Alarm Summary object. The Alarm Summary Configuration dialog box appears.
2. Select the Filter tab.

3. Select the column you want to add to your filter condition.
4. Click Add Filter Condition and complete the dialog box that appears.

**NOTE:** The Alarm Summary object supports up to ten filter conditions.

#### Changing Boolean Operators

► **To change the Boolean operator:**

1. In the iFIX WorkSpace, double-click the Alarm Summary object. The Alarm Summary Configuration dialog box appears.
2. Select the Filter tab.
3. Select the portion of the filter condition you want to modify.
4. Click **OR**, **AND**, or **NOT** to change the Boolean operator.

#### Configuring Alarm Summary to Sort Alarms

► **To configure the Alarm Summary object to sort alarms:**

1. In the iFIX WorkSpace, double-click the Alarm Summary object. The Alarm Summary Configuration dialog box appears.
2. Select the Sort tab.
3. Select the attribute you want to sort by.
4. Select whether you want to sort alarms in ascending or descending order.

#### Creating Filter Conditions

► **To create a filter condition:**

1. In the iFIX WorkSpace, double-click the Alarm Summary object. The Alarm Summary Configuration dialog box appears.
2. Select the Filter tab.
3. Double-click each column you want to filter on and complete the dialog box that appears.

**NOTE:** The Alarm Summary object supports up to ten filter conditions.

#### Deleting Filter Conditions

► **To delete a filter condition:**

1. In the iFIX WorkSpace, double-click the Alarm Summary object. The Alarm Summary Configuration dialog box appears.
2. Select the Filter tab.
3. From the Display Alarms Where box, select the portion of the filter condition you want to delete and click Remove.

**Inserting Filter Conditions**

► **To insert a filter condition:**

1. In the iFIX WorkSpace, double-click the Alarm Summary object. The Alarm Summary Configuration dialog box appears.
2. Select the Filter tab.
3. From the Display Alarms Where box, highlight the portion of the filter condition where you want to insert a new condition.
4. From the Fields box, select the column you want to add to the filter condition.
5. Click Insert Filter Condition and complete the dialog box that appears.

**NOTE:** The Alarm Summary object supports up to ten filter conditions.

**Modifying Filter Conditions**

► **To modify a filter condition:**

1. In the iFIX WorkSpace, double-click the Alarm Summary object. The Alarm Summary Configuration dialog box appears.
2. Select the Filter tab.
3. From the Display Alarms Where box, select the portion of the filter condition you want to modify.
4. Click Modify. The Modify Area dialog box appears.
5. In the Modify Area dialog box, enter the required changes and click OK.

**Acknowledging Alarms**

In the iFIX WorkSpace, you can perform the following steps with alarm acknowledgments:

- [Acknowledging Alarms with the Alarm Summary Object](#)
- [Creating a Data Link That Displays Alarms](#)

**Acknowledging Alarms with the Alarm Summary Object**

► **To acknowledge alarms with the Alarm Summary object:**

- For a single alarm, right-click the object in the iFIX WorkSpace and select Acknowledge from the pop-up menu.
- For all alarms, right-click the object in the iFIX WorkSpace and select Acknowledge All from the pop-up menu.
- For all alarms currently displayed on the screen, right-click the object in the iFIX WorkSpace and select Acknowledge Page from the pop-up menu.

**Creating a Data Link That Displays Alarms**

► **To create a Data link that displays alarms:**

1. Open or create a picture in the iFIX WorkSpace.
2. In Classic view, from the Shapes toolbar, click the Data link button.

-Or-

In Ribbon view, on the Insert tab, in the Objects/Links group, click Objects/Links, and then click Datalink.

-Or-

If the Toolbox is enabled, click the Datalink button on the Toolbox.

The cursor changes to a plus sign.

3. Click and drag the mouse to define the size of the Data link.
4. In the Source field, enter the data source you want to use. Use the A\_CUALM field name when entering a data source to show the current alarm.
5. Complete the remainder of the Datalink dialog box.

**Changing Default Settings**

In the iFIX WorkSpace, you can perform the following steps with the default settings:

- [Restoring the Alarm Summary Object's Default Settings](#)
- [Saving the Alarm Summary Object's Current Settings](#)

**Restoring the Alarm Summary Object's Default Settings**

► **To restore the Alarm Summary object's default settings:**

1. In the iFIX WorkSpace, double-click the Alarm Summary object. The Alarm Summary Configuration dialog box appears.
2. Click Reset. The default settings get applied to the selected Alarm Summary object.

**TIP:** Only the settings in the *selected* Alarm Summary object get restored. If you want other Alarm Summary objects that you create after this one to also use the same default settings, click Save. This saves your Alarm Summary settings to the AlarmSummary.ini file in the LOCAL folder (by default: C:\Program Files (x86)\GEiFIX\LOCAL), so that subsequent Alarm Summary objects will apply these default settings when you first drop the object into your picture.

#### Saving the Alarm Summary Object's Current Settings

##### ► To save the Alarm Summary object's current settings:

1. In the iFIX WorkSpace, double-click the Alarm Summary object. The Alarm Summary Configuration dialog box appears.
2. Click Save. This saves the currently selected Alarm Summary object's settings into the AlarmSummary.ini file in the LOCAL folder (by default: C:\Program Files (x86)\GEiFIX\LOCAL), so that subsequent Alarm Summary objects that you add to your pictures will use these settings by default.

#### Working with Run-Time Settings and Properties

In the iFIX WorkSpace, you can perform the following steps with the run-time settings and properties:

- [Configuring the Selection Timeout](#)
- [Enabling and Disabling Alarm Summary Operator Properties](#)
- [Setting the Alarm Refresh Rate](#)
- [Setting the Blink Rate](#)
- [Setting the Data Refresh Rate](#)
- [Showing the Latched or Current Alarm Status](#)
- [Reversing the Text and Background Colors of Alarms Based on Acknowledgment State](#)

#### Configuring the Selection Timeout

##### ► To configure the selection timeout:

1. In the iFIX WorkSpace, double-click the Alarm Summary object. The Alarm Summary Configuration dialog box appears.
2. Select the Display tab.
3. Enter the number of seconds the Alarm Summary object should wait before deselecting an alarm.

#### Enabling and Disabling Alarm Summary Operator Properties

► **To enable and disable the Alarm Summary operator properties:**

1. In the iFIX WorkSpace, double-click the Alarm Summary object. The Alarm Summary Configuration dialog box appears.
2. Select the Operator tab.
3. Select the check box of each property you want to enable.
4. Clear the check box of any property you want to disable.

**Setting the Alarm Refresh Rate**

► **To set the alarm refresh rate:**

1. In the iFIX WorkSpace, double-click the Alarm Summary object. The Alarm Summary Configuration dialog box appears.
2. Select the Display tab.
3. Enter the number of seconds the Alarm Summary object should wait before reading its queue for new alarms.

**Setting the Blink Rate**

► **To set the blink rate:**

1. In the iFIX WorkSpace, double-click the Alarm Summary object. The Alarm Summary Configuration dialog box appears.
2. Select the Display tab.
3. Enter the rate, in seconds, that the Alarm Summary object should flash unacknowledged alarms.

**Setting the Data Refresh Rate**

► **To set the data refresh rate:**

1. In the iFIX WorkSpace, double-click the Alarm Summary object. The Alarm Summary Configuration dialog box appears.
2. Select the Display tab.
3. Enter the number of seconds the Alarm Summary object should wait before updating the alarm values displayed on the screen.

**Showing the Latched or Current Alarm Status**

► **To show the latched or current alarm status in the Alarm Summary window:**

1. In the iFIX WorkSpace, double-click the Alarm Summary object. The Alarm Summary Configuration dialog box appears.
2. Select the Display tab.
3. Select the Show Current Alarm Status or Show Latched Alarm Status option.
4. Click Apply.

**Reversing the Text and Background Colors of Alarms Based on Acknowledgment State**

► **To reverse the text and background colors of unacknowledged alarms:**

1. In the iFIX WorkSpace, double-click the Alarm Summary object. The Alarm Summary Configuration dialog box appears.
2. Select the Display tab.
3. Select the Reverse Colors On Unack Alarms option.
4. Click Apply.

► **To reverse the text and background colors of acknowledged alarms:**

1. In the iFIX WorkSpace, double-click the Alarm Summary object. The Alarm Summary Configuration dialog box appears.
2. Select the Display tab.
3. Select the Reverse Colors On Ack Alarms option.
4. Click Apply.

## Working with Groups

In the iFIX WorkSpace, you can perform the following steps with grouping objects and layers:

- [Grouping Two or More Objects](#)
- [Ungrouping Objects](#)
- [Animating Grouped Objects](#)
- [Drilling Down into a Group](#)
- [Setting Object Layers](#)
- [Displaying Layers in Pictures](#)

### Grouping Two or More Objects

► **To group two or more objects:**

1. In the iFIX WorkSpace, control-click the objects.
2. In Classic view, from the Tools toolbar, click the Group button.

-Or-

In Ribbon view, on the Format tab, in the Arrange group, click Group.

-Or-

If the Toolbox is enabled, click the button on the Toolbox.

The objects are grouped together and a group object appears in the WorkSpace system tree.

## Ungrouping Objects

► **To ungroup an object:**

1. In the iFIX WorkSpace, select the grouped object.
2. In Classic view, from the Tools toolbar, click the Ungroup button.

-Or-

In Ribbon view, on the Format tab, in the Arrange group, click Ungroup.

-Or-

If the Toolbox is enabled, click the Ungroup button on the Toolbox.

The group object is removed from the system tree but the member objects remain.

## Animating Grouped Objects

► **To animate a grouped object:**

1. In the iFIX WorkSpace, right-click the group you want to animate, and select Animations. The Basic Animation dialog box appears.
2. Click the appropriate Expert button.
3. Enter the configuration information for the Animation Expert.

## Drilling Down into a Group

► **To drill down into a group:**

1. In the iFIX WorkSpace, select the group containing the object you want to modify.
2. Right-click the group and choose Enter DrillDown. A box appears around the group.
3. Select the object in the group you want to change.

4. Make the changes you require. When finished, deselect the object and the group. The box disappears.

## Setting Object Layers

► To set a layer for an object:

1. In the iFIX WorkSpace, select the object you want to set a layer for.
2. In Classic view, on the Tools toolbar, click the Set Layer button.  
-Or-  
In Ribbon view, on the Format tab, in the Picture group, click Layers, and then click Set Layer.  
-Or-  
If the Toolbox is enabled, click the Set Layer button on the Toolbox.
3. Click the button that represents the number of the layer you want to assign. To assign multiple layers, select the Allow for Multiple Layers check box and then click the numbered buttons, or click Select All. If you make a mistake, click Deselect All and repeat this step.
4. Click OK.

## Displaying Layers in Pictures

► To display layers in a picture:

1. In Classic view, in the iFIX WorkSpace Tools toolbar, click the Display Layers button.  
-Or-  
In Ribbon view, on the Format tab, in the Picture group, click Layers, and then click Display Layer.  
-Or-  
If the Toolbox is enabled, click the Display Layers button on the Toolbox.
2. Click the button that represents the layer you want to display. To select all possible layers to be displayed, click Select All Layers. If you make a mistake, click Deselect All Layers and repeat this step.
3. Click OK.

## Using Color

In the iFIX WorkSpace, you can perform the following steps with colors:

- [Color Selection Overview - Modal](#)
- [Color Selection Overview - Modeless](#)

- [Adding Fade, Foreground, Background, or Edge Colors to Objects](#)
- [Setting the Background Color of a Picture](#)
- [Setting the Fade Color of a Picture](#)
- [Setting the Blend Percentage of a Picture's Fade Color](#)
- [Setting the Blend Percentage of an Object's Fade Color](#)
- [Selecting Color Sets](#)
- [Assigning Colors to Properties](#)
- [Creating Custom Color Sets](#)
- [Assigning a Custom Name to a Color](#)
- [Coloring Objects by Analog Values](#)
- [Coloring Objects by Digital Values](#)

#### **Adding Fade, Foreground, Background, or Edge Colors to Objects**

► **To add a fade color to a specific object:**

1. In the iFIX WorkSpace, right-click the object, point to Color, and choose Fade. The Select FadeColor dialog box appears.
2. Click the Fade button. The Select Color dialog box appears.
3. Select a color and click OK. To select a name, click the Name tab and select a color name from the list.

► **To add a foreground color to a specific object with no gradient fill:**

1. In the iFIX WorkSpace, right-click the object, point to Color, and choose Foreground. The Select ForegroundColor dialog box appears.
2. Select a color and click OK. To select a name, click the Name tab and select a color name from the list.

► **To add a foreground color to a specific object with a gradient fill:**

1. In the iFIX WorkSpace, right-click the object, point to Color, and choose Foreground. The Select ForegroundColor dialog box appears.
2. Click the Foreground button. The Select Color dialog box appears.
3. Select a color and click OK. To select a name, click the Name tab and select a color name from the list.

► **To add a background color to a specific object:**

1. In the iFIX WorkSpace, right-click the object, point to Color, and choose Background. The Select BackgroundColor dialog box appears.
2. Select a color and click OK. To select a name, click the Name tab and select a color name from the list.

► **To add an edge color to a specific object:**

1. In the iFIX WorkSpace, right-click the object, point to Color, and choose Edge. The Select EdgeColor dialog box appears.
2. Select a color and click OK. To select a name, click the Name tab and select a color name from the list.

**Setting the Background Color of a Picture**

► **To set the background color of a picture:**

1. In the iFIX WorkSpace, right-click any area in the picture outside of an object and choose Picture. The Edit Picture dialog box appears.
2. Click the Background Color button. The Select BackgroundColor dialog box appears.
3. Select the color you want and click OK.

**Setting the Fade Color of a Picture**

► **To set the fade color of a picture:**

1. In the iFIX WorkSpace, right-click any area in the picture outside of an object and choose Picture.
2. Click the Fade Color button.
3. Select the color you want and click OK.

**Setting the Blend Percentage of a Picture's Fade Color**

► **To set the blend percentage of a picture's fade color:**

1. In the iFIX WorkSpace, right-click any area in the picture outside of an object and choose Picture. The Edit Picture dialog box appears.
2. Select the Gradient enabled check box and then select the fade type you want to apply to the gradient.
3. Move the Blend slider to increase or decrease the amount of fade color you want applied to the fade type. The higher the percentage, the more fade color is visible.

**Setting the Blend Percentage of an Object's Fade Color**

► **To set the blend percentage of an object's fade color:**

1. In the iFIX WorkSpace, right-click the object, point to Color, and choose Fade. The Select FadeColor dialog box appears.

2. Move the Blend slider to increase or decrease the amount of fade color you want applied to the fade type. The higher the percentage, the more fade color is visible.

#### Selecting Color Sets

##### ► To select a color set:

1. In the iFIX WorkSpace, right-click an object, point to Color, and choose Fade, Foreground, Background, or Edge. The applicable Select Color dialog box appears.  
- Or -  
Select an object and click the Color button in the Toolbox. The Select Color dialog box appears.
2. In the Color Set field, select a color set from the list box.

#### Assigning Colors to Properties

##### ► To assign a color to a property:

1. In Classic view, in the iFIX WorkSpace, on the Tools toolbar, click the Color button.  
-Or-  
In Ribbon view, on the Format tab, in the Styles group, click Color Selection.  
-Or-  
If the Toolbox is enabled, click the Color button on the Toolbox.
2. In the Property field, select the property you want. Use the drop-down menu if necessary.
3. Select a color from the Color Selection dialog box.

#### Selecting Color Sets

##### ► To select a color set:

1. In the iFIX WorkSpace, right-click an object, point to Color, and choose Fade, Foreground, Background, or Edge. The applicable Select Color dialog box appears.  
- Or -  
Select an object and click the Color button in the Toolbox. The Select Color dialog box appears.
2. In the Color Set field, select a color set from the list box.

#### Creating Custom Color Sets

##### ► To create a custom color set:

1. In Classic view, in the iFIX WorkSpace, on the Tools toolbar, click the Color button.

-Or-

In Ribbon view, on the Format tab, in the Styles group, click Color Selection.

-Or-

If the Toolbox is enabled, click the Color button on the Toolbox.

2. Click either the Color tab to display the color palette, or the Name tab to display a list of colors.
3. Click New Color Set.
4. Enter a palette name in the Name field and click OK. The palette name is added to the Color Set list box.

#### Assigning a Custom Name to a Color

► **To assign a custom name to a color:**

1. In Classic view, in the iFIX WorkSpace, on the Tools toolbar, click the Color button.

-Or-

Ribbon view, on the Format tab, in the Styles group, click Color Selection.

-Or-

If the Toolbox is enabled, click the Color button on the Toolbox.

2. From the Color Set field, select a color set.
3. Click the Customize Color button.

**NOTE:** The Customize Color button is not available if you selected System Default as the color set.

4. Click a location in the palette that most closely represents the color you want.
5. Specify the shade of the color spectrum by clicking the mixer bar to the right of the palette and click OK. For a more precise selection, adjust the slider by clicking and dragging it.
6. Enter a specific name to identify your color.

#### Coloring Objects by Analog Values

► **To color an object by analog value:**

1. In the iFIX WorkSpace, select an object.
2. Click the appropriate Color Expert on the Experts toolbar.

-Or-

In Classic view, click the Task Wizard button on the WorkSpace toolbar.

-Or-

In Ribbon view, from the Tools tab, in the Animations group, click Animations. Select the appropriate Color Expert from the Task Wizard dialog box and click the Perform Task button.

3. In the Data Source field, enter a data source.
4. Select the Range option above the lookup table.
5. Select a Minimum and Maximum cell in the lookup table row that corresponds to the color you want to assign to those values.
6. Enter the appropriate low and high limit values for the color selection in the row.

#### **Coloring Objects by Digital Values**

► **To color an object by digital value:**

1. In the iFIX WorkSpace, select an object.
2. Click the appropriate Color Expert on the Experts toolbar.  
-Or-  
In Classic view, click the Task Wizard button on the WorkSpace toolbar.  
-Or-  
In Ribbon view, from the Tools tab, in the Animations group, click Animations. Select the appropriate Color Expert from the Task Wizard dialog box and click the Perform Task button.
3. In the Data Source field, enter a data source.
4. Select the Exact Match option above the lookup table.
5. If desired, enter a tolerance value in the Exact Match Tolerance field.
6. Double-click a Value cell in a lookup table row that corresponds to the color you want to assign to that value.
7. Enter the appropriate digital value for the color selection in the row.

## **Using Process Assistants to Expedite Pictures**

By studying the trends in today's users, and focusing specifically on iFIX users, GE has developed a set of performance support tools that let you tap the power of iFIX with minimal effort. These tools include:

- [Wizards](#)
- [Experts](#)
- [Dynamics](#)
- [Global Subroutines](#)
- [Toolbars](#)

Each of these tools are described in this chapter.

### **Using Wizards and Experts**

GE developed Wizards and Experts with one goal in mind - allow users to unleash the power of iFIX quickly and easily. Wizards and Experts are essentially simplified user interfaces that help you accomplish a task.

The fundamental difference between Wizards and Experts is:

- *Wizards* consist of a series of dialog boxes that guide you through a process and engage you in dialog that helps you understand that process.
- *Experts* consist of one dialog box that requires minimum input to quickly perform a task. They provide an easier way to animate objects or execute scripts, tasks that you can also accomplish using the Basic Animations dialog box.

iFIX Wizards and Experts were created to help both advanced and novice users. Advanced users can carry the process to additional steps, perhaps by using a powerful feature of VBA, re-entering an Expert after performing another function, or learning a new feature by implementing it.

Novice users can run a Wizard or Expert in an effort to complete a more complicated task without adapting to new concepts or technology. Although the underlying foundation of Wizards and Experts is Visual Basic, you never need to be exposed to or versed in VBA to use these tools.

Ultimately, employing Wizards and Experts in your picture development means you can complete desired tasks and enjoy the results.

## Running Wizards

iFIX provides the following Wizards:

- **Task** - Access from a button on the Standard toolbar.
- **Generate** - Access through the Generate option on the Blocks menu of the Database Manager.
- **Backup and Restore** - Access through the iFIX menu on the Programs menu of the Start menu.
- **Create Picture** - Access through the Task wizard, using one of the following methods:
  - by right-clicking on the Pictures folder in the system tree,
  - by selecting New from the File menu in the WorkSpace (Classic view),
  - by clicking Picture in the New group, on the Home tab (Ribbon view),
  - by clicking the WorkSpace button, selecting new and clicking Picture (Ribbon view), or
  - from one of the following toolbars: Experts, Standard, or Toolbox.

**NOTE:** To access the Create Picture wizard from the Menu Bar, the Ribbon, the System Tree, or the Standard toolbar, you must have the Show Picture Wizard from New Picture Menu check box enabled on the Picture Preferences tab of the User Preferences dialog box.

- **Multiple Command Script** - Access from the Command category of the Task Wizard, the Click Event button in the Basic Animation dialog box, or the Run Wizard button in the Key Macro Editor or Scheduler.

The following table shows how these Wizards can be used in iFIX.

### Wizards in iFIX

While doing    You can    To...

the following...	use the...	
Resolving a picture	Task Wizard	Run the Resolve utility. For more information, refer to the <a href="#">Resolving Pictures</a> section. To learn how to use the Task Wizard, refer to the <a href="#">Using Experts and the Task Wizard</a> section of the Understanding iFIX manual.
Building a database	Generate Wizard	Add blocks to your database. For more information, refer to the <a href="#">Working with the Process Database</a> chapter in the Building a SCADA System manual.
Managing your files	Backup and Restore Wizard	Archive all of your iFIX configuration files. For more information, refer to the <a href="#">Backing up and Restoring Files</a> section of the Understanding iFIX manual.
Creating a picture or set of pictures	Create Picture Wizard	Set the sizes, locations, and properties of an individual picture or a group of pictures. For more information, refer to the <a href="#">Using the Create Picture Wizard</a> section in this manual.
Assigning multiple commands to an event	Multiple Command Script Wizard	Create a sequence of commands that are executed in response to a trigger event such as a mouse click, Scheduler entry, or key macro. For more information, refer to the <a href="#">Multiple Command Script Wizard</a> section.

## Running Experts

You can easily access iFIX Experts in the WorkSpace while you are drawing your pictures. In our online help, Experts are included in procedures to help you expedite your task. For more information on how to complete the dialog fields in the Expert, use the Help provided with the Expert (in some instances, you must click the Help button and access a procedures window). The following table shows some examples of Experts used in iFIX.

### Using Experts in iFIX

While doing the following...	You can use the...	To...
Coloring objects	Foreground Color Expert	Assign a foreground color to objects. For more information on Color Expert defining a color strategy, refer to the <a href="#">Working with Color</a> section.
Creating schedules	Script Authoring Expert	Write a script to schedule events (example: Toggle Digital Point). For more information, refer to the <a href="#">Writing Scripts</a> manual.
Developing pictures	Rotate Expert	Rotate a selected object. For more information on rotating objects, refer to the <a href="#">Rotating Objects</a> section.

To run an Expert, click the appropriate button on the Experts toolbar, complete the dialog fields and click OK.

## Using the Task Wizard to Run Experts

iFIX gives you a convenient organizer to access, customize, and run Experts - the Task Wizard. The Task Wizard allows you to choose a category relating to what action you want to perform, and then

select a task specific to that category. All Experts can be accessed from the Task Wizard, but some are not available from the Experts toolbar. These Experts can be accessed on the Buttons tabbed page of the Customize Toolbars dialog box and added to a toolbar. In Ribbon view, all Experts can be accessed via the Tasks/Experts launch button on the Tools tab in the Tasks/Experts group.

For more information on adding buttons to a toolbar, refer to the [Customizing Toolbars](#) section of the Understanding iFIX manual.

The following table shows you which Experts are available on the Task Wizard and the Experts toolbar, and what functions they perform:

**iFIX Experts**

<b>Click this Expert from the Experts toolbar...</b>	<b>Which can be accessed in the Ribbon view...</b>	<b>To...</b>
Fill 	From the Tools tab, in the Animations group, click Fill.	Dynamically fill an object.
Rotate 	From the Tools tab, in the Animations group, click Rotate.	Rotate an object.
Position 	From the Tools tab, in the Animations group, click Position.	Move an object horizontally or vertically across the screen.
Scale 	From the Tools tab, in the Animations group, click Scale.	Scale an object.
Visibility 	From the Tools tab, in the Animations group, click Visibility.	Make an object visible or invisible.
Edge Color 	From the Tools tab, in the Animations group, click Edge Color.	Change the edge color of an object.
Foreground Color 	From the Tools tab, in the Animations group, click Foreground Color.	Change the foreground color of an object.
Background Color 	From the Tools tab, in the Animations group, click Background Color.	Change the background color of an object.
Data Entry 	From the Tools tab, in the Tasks/Experts group, click Data Entry Expert.	Modify a tag.
Create Picture Wizard	From the Tools tab, in the Tasks/Experts group, click Picture	Create, size, and locate a group of pictures.

	and then click Create Picture Wizard.	
	From the Tools tab, in the Tasks/Experts group, click Commands and then click Open Picture.	Open a new picture on an object's click event.
	From the Tools tab, in the Tasks/Experts group, click Commands and then click Close Picture.	Close a picture on an object's click event.
	From the Tools tab, in the Tasks/Experts group, click Commands and then click Replace Picture.	Close an open picture and replace with a new picture on an object's click event.
	From the Tools tab, in the Tasks/Experts group, click Commands and then click Open Digital Tag.	Open a digital point on an object's click event.
	From the Tools tab, in the Tasks/Experts group, click Commands and then click Close Digital Tag.	Close a digital point on an object's click event.
	From the Tools tab, in the Tasks/Experts group, click Commands and then click Toggle Digital Tag.	Toggle a digital point on an object's click event.  <b>NOTE:</b> In this expert, use the F_CV field as the data link. Using the A_CV field may cause unpredictable results.
	From the Tools tab, in the Tasks/Experts group, click Commands and then click Acknowledge Alarm.	Acknowledge an alarm on an object's click event.
	From the Tools tab, in the Tasks/Experts group, click Commands and then click Alarm Horn.	Enable, disable, or silence the alarm horn. Also prompt for alarm horn status in run mode and toggle the horn status between enable and disable.

The following table shows you the additional Experts available from the Task Wizard (but not from the Experts toolbar) and what functions they perform:

Additional Experts in the Task Wizard				
From this Task Category...	Click this Expert...	Which can be accessed in the Ribbon View...	To...	
Command	Ramp Tag Value	From the Tools tab, in the Tasks/Experts group, click Commands and then Ramp Tag Value.	Ramp a specified database tag by a percentage or actual value that you define.	
	Write Value to Tag	From the Tools tab, in the Tasks/Experts group, click Commands and then Write Value to Tag.	Write a value you select to the specified database tag.	

		mands and then Write Value to Tag.
	Turn Tag On Scan	From the Tools tab, in the Tasks/Experts group, click Commands and then Turn Tag On Scan.
	Turn Tag Off Scan	From the Tools tab, in the Tasks/Experts group, click Commands and then Turn Tag Off Scan.
	Toggle Scan	From the Tools tab, in the Tasks/Experts group, click Commands and then Toggle Scan.
	Set Tag Auto	From the Tools tab, in the Tasks/Experts group, click Commands and then Set Tag Auto.
	Set Tag Manual	From the Tools tab, in the Tasks/Experts group, click Commands and then Set Tag Manual.
	Toggle Tag Auto/Manual	From the Tools tab, in the Tasks/Experts group, click Commands and then Toggle Tag Auto/Manual.
	Acknowledge All Alarms	From the Tools tab, in the Tasks/Experts group, click Commands and then Acknowledge All Alarms.
	Disable Alarm	From the Tools tab, in the Tasks/Experts group, click Commands and then Disable Alarms.
	Enable Alarm	From the Tools tab, in the Tasks/Experts group, click Commands and then Enable Alarms.
	Locate Object	From the Tools tab, in the Tasks/Experts group, click Commands and then Locate Object.
	Print Crystal Report	From the Tools tab, in the Tasks/Experts group, click Commands and then Print Crystal Report.
	Add Database Block	From the Applications tab, in the Process Database group, click Blocks and then click Add Database Block.
Database	Modify Data-base Block	From the Applications tab, in the Process Database group, click Blocks and then click Modify Data base Block.
	Database Save	From the Applications tab, in the Save the database.

		Process Database group, click Save Database.	
	Database Reload	From the Applications tab, in the Process Database group, click Reload Database.	Reload the database.
Data Entry	Data Entry	From the Tools tab, in the Tasks/Experts group, click Tasks/Experts. Select Data Entry from the Task Categories menu and Data Entry from the Task list. Click Perform Task.	Enter the data source that the data entry gets written to.
	Resolve Files	From the Tools tab, in the Tasks/Experts group, click Tasks/Experts. Select Picture from the Task Categories menu and Resolve Files from the Task list. Click Perform Task.	Resolve files before you enter into the run-time environment.
	Generate New Picture	From the Tools tab, in the Tasks/Experts group, click Picture and then click Generate Picture Expert.	Generate a new picture.
	Refresh Rate	From the Tools tab, in the Tasks/Experts group, click Picture and then click Refresh Rate Expert.	Change the refresh rate for a selected object or an entire picture.
	Export Key Macros	From the Tools tab, in the Tasks/Experts group, click Picture and then click Export Key Macros.	Export all of the key macros in the selected object, picture, or user global page to a .CSV file.
Picture	Save Files with Thumbnail Preference	From the Tools tab, in the Tasks/Experts group, click Tasks/Experts. Select Picture from the Task Categories menu and Save Files with Thumbnail Preference from the Task list. Click Perform Task.	Save thumbnails of existing pictures and Dynamo Sets.
	Convert a Selected Button's Caption	From the Application tab, in the Utilities group, on the drop down menu, click Convert a Selected Button's Caption.	Converts one button caption text to scale to a new screen resolution in pictures using the Enhanced Coordinate System.
	Multiple Button Caption Converter Expert	From the Application tab, in the Utilities group, on the drop down menu, click Multiple Button Caption Converter Expert.	Converts more than one or all the button caption text to scale a new screen resolution in pictures using the Enhanced Coordinate System.
	Upgrade to Enhanced	From the Applications tab, in the Utilities group, click Upgrade to	Upgrade one or more pictures/Dynamo Sets to the

		Enhanced Coordinates.	Enhanced Coordinate System -Or- Restore one or more pictures/dynamo Sets to the Logical Coordinate System.
Report	Print Crystal Report	From the Tools tab, in the Tasks/Experts group, click Commands and then click Print Crystal Report.	Prints a specified Crystal Report.

You can also create your own Experts to help you automate processes that you do often. This can be done through VBA scripts. For more information on creating your own Experts, refer to the [Writing Scripts](#) manual. To learn how to use the Task Wizard, refer to the [Using Experts and the Task Wizard](#) section of the Understanding iFIX manual.

**IMPORTANT:** If you are working in a secure environment and using the Electronic Signature option, you must be aware of the impact of unsigned writes to the process database. Unsigned writes can originate from scripts Refer to the [Implications of Database Writes With Electronic Signature](#) section of the Using Electronic Signatures manual for detailed information. When you use certain Experts, such as Toggle Digital, you are prompted to sign if the associated tag is configured for electronic signature. For complete information on a secure environment and electronic signatures, refer to the [Using Electronic Signatures](#) manual.

### Re-entering Experts

All of the Experts in the Animation category of the Task Wizard have *re-entrance functionality*, allowing you to exit the Expert, make any changes you want within your picture, and then go back into the Expert to resume inputting data to complete the task. These Experts include the following:

- Fill
- Foreground Color
- Edge Color
- Background Color
- Rotate
- Scale
- Visibility
- Position

You can also re-enter the Data Entry Expert, located in the Data Entry category of the Task Wizard.

**NOTE:** The Data Entry Expert writes a script to a selected object; therefore, it will not retain its re-entrance functionality if you change the code. Instead, it will act as though there are no data entry parameters, and will therefore write over the existing script.

### Notes About VBA Code Generated by Experts

Some of the iFIX Experts generate VBA code. Occasionally, a conflict can occur between the VBA code generated by the Expert and the VBA code for a picture, variable, or globals page because of naming conflicts. When a conflict like this occurs, the solution is to change the name of your picture, variable, or globals subroutine.

For example, do not name a picture after one of Data Entry Expert types. Picture names can conflict with the script variable names used with the Data Entry Expert. For instance, if you name your picture Pushbutton.grf and also use the Pushbutton data entry method, when you enter run mode, an error mes-

sage appears. If you rename the picture, Pushbutton1.grf, the error message does not appear, since the picture name is now different than the data entry method.

## Multiple Command Script Wizard

The Multiple Command Script Wizard enables you to create a sequence of commands, using one or more Command Experts, that is triggered by one of these types of events: a mouse click on an object in a picture, a time-based or event-based Scheduler entry, or a key macro.

When you open the wizard and select a command, the Expert associated with the command will appear. The selections you make in the Expert automatically create a VBA script that is run when the trigger event occurs. Each time you add a command in the wizard, its corresponding Expert will appear, enabling you to append the Expert's VBA script to the scripts created by the previous commands in the sequence.

You can use the wizard to delete or re-order commands in the sequence. When you do this, the VBA script associated with the affected commands will be automatically deleted or re-ordered to reflect the new sequence displayed in the wizard.

### ► To use the Multiple Command Script Wizard:

1. In the Key Macro Editor, Scheduler, or the Basic Animation dialog box, access the Multiple Command Script Wizard.
2. Add one or more commands by either selecting one from the Select Action to Append list, or clicking the Append Action button to add the currently selected command.
3. Optionally, move a command to a different position in the sequence by selecting it and clicking the Up or Down arrow button.
4. Optionally, delete a command from the sequence by selecting it and then clicking the Delete Action button, or delete all commands by clicking the Delete All Actions button.
5. Optionally, modify a command by clicking the Modify a Selected Action button. When the Expert for the associated command appears, make your changes to the Expert's settings and click OK.

### NOTES:

- Although the Multiple Command Script Wizard's purpose is to fully automate the VBA command scripting process, you can manually edit scripts generated by the wizard with the VB Editor. You may add or edit VBA scripts anywhere before the Scripts Authoring Tool header line (\*\*\*\*\* Scripts Authoring Tool \*\*\*\*\*), or directly between a "WizardEnd" and a "Wizard[x] =" statement. Do not edit any of the commented areas in the wizard-generated script. If the Multiple Command Script Wizard detects an improperly customized VBA script, you may encounter an error.
- The Multiple Command Script Wizard does not check the command sequence to make sure commands occur in a logical order.

## Experts Summary

The following experts are available for use in iFIX.

## **Animation Experts**

- [Color Experts](#)
- [Fill Expert](#)
- [Position Expert](#)
- [Rotate Expert](#)
- [Scale Expert](#)
- [Visibility Expert](#)
- [Display Layers Expert](#)
- [Set Layer Expert](#)

## **Command Experts**

- [Selecting a Command](#)
- [Acknowledge Alarm](#)
- [Acknowledge All Alarms](#)
- [Alarm Horn](#)
- [Close Digital Tag](#)
- [Close Picture](#)
- [Disable Alarm](#)
- [Enable Alarm](#)
- [Locate Object](#)
- [Open Digital Tag](#)
- [Open Picture](#)
- [Print Crystal Report](#)
- [Ramp Tag Value](#)
- [Replace Picture](#)
- [Set Tag Auto](#)
- [Set Tag Manual](#)
- [Shelve Expert](#)
- [Toggle Digital Tag](#)
- [Toggle Tag Auto/Manual](#)
- [Toggle Scan](#)
- [Turn Tag Off Scan](#)
- [Turn Tag On Scan](#)
- [Unshelve Expert](#)
- [Write Value to Tag](#)

## **Data Entry Expert**

- [Data Entry Expert](#)

## **Database Experts**

- [Add Database Block](#)
- [Database Reload](#)
- [Database Save](#)
- [Modify Database Block Expert](#)
- [Read a Value Expert](#)

## **Picture Experts**

- [Button Caption Converter](#)
- [Export Key Macros](#)
- [Generate Picture Expert](#)
- [Refresh Rate Expert](#)
- [Resolve Files Expert](#)
- [Save Files with Thumbnail Preferences](#)
- [Upgrade File to Enhanced Coordinates](#)

## **Report Experts**

- [Cross Reference Tool](#)
- [Print Crystal Report](#)
- [Print Crystal Report \(PrintReport Subroutine\)](#)

## **Create Objects**

- [Variable Object](#)
- [Timer Object](#)
- [Event Object](#)

## **Animation Experts**

The following list summarizes the Animation Experts available in iFIX:

- [Color Experts](#)
- [Fill Expert](#)
- [Position Expert](#)
- [Rotate Expert](#)
- [Scale Expert](#)
- [Visibility Expert](#)

- [Display Layers Expert](#)
- [Set Layer Expert](#)

**IMPORTANT:** Be aware that Historical Animations that use Sample or Interpolated data from GE Historian may display a Lookup or Format error status of “Unknown”, when the local computer’s time is ahead of the GE Historian Server’s time. (The “Unknown” Lookup or Format data symbols are defined in the User Preferences, on the Animations Data Error Defaults tab.)

#### Color Expert

Lets you set the way the selected object(s) color is animated in the runtime environment. There are three color experts:

- Background Color Expert
- Foreground Color Expert
- Edge Color Expert

#### Data Source

Allows you to enter the data source that animates the selected object(s) color property. Click the browse button (...) to view all of data sources available in your system. Click the down button to view the last data sources you used. Click the modify database block button to modify the selected data source. You can add a database block by entering a new database block tag name and tabbing off this field. The Quick Add dialog box appears and allows you to enter the appropriate values for the added block.

## Color Properties Tab

The Color Properties tab contains the following items:

#### Color By

Item	Description
Current Value	Allows you to enter a value or range of values and assign each a unique color in the Color Threshold table to the right. When the current value of the data source falls within or on that color definition, the selected object(s) change to that color.
Current Alarm	Allows you to set up color thresholds to visually alert operators that a data source is in a particular alarm state. This differs from the Latched Alarm option in how it handles multiple alarm states. Selecting current alarm always displays the color assigned to the current alarm.
Latched Alarm	Allows you to set up color thresholds to visually alert operators that a data source is in a particular alarm state. This differs from the Current Alarm option in how it handles multiple alarm states. When a data source is in more than one alarm state that has defined thresholds, the latched alarm strategy displays the color assigned to the unacknowledged alarm of the highest priority. If there are

no unacknowledged alarms, it displays the color of the current alarm.

## New Alarm

Item	Description
Blink on New Alarm	Sets the selected object(s) to blink every time the data source registers a new alarm. The object stops blinking when the alarm is acknowledged. This setting overrides the blinking settings defined for individual thresholds. The object blinks between the color of the threshold table and the blink on a new alarm color.
Blink on New Alarm Color	Sets the color for the blink on new alarm if the Blink on New Alarm check box is selected.

## Color Threshold

Item	Description
Range	If the value of the data source falls within a specified threshold range in the table below, the selected object(s) change to the associated color.
Exact Match	If the value of the data source exactly matches a threshold value in the table below, the selected object(s) change to the associated color.
Exact Match Tolerance	Lets you enter an allowable deviation from the current value of a data source. For example: If the current value is 10, and the tolerance is 5, the range that the color will display is from 5 to 15.
Color List Box	Allows you to animate an object's color based on a specified value. To assign values, click a cell within the Maximum, Minimum, and Value columns and enter a value. To assign colors, double-click a cell within the Color and Blink To columns and select a color from the color box.
No Blink	Removes a blink color assigned to the selected row in the color table threshold.
Insert Row	Inserts a new row into the color threshold table.
Delete Row	Deletes the selected row of the color threshold table.
Reset to Defaults	Resets the Color Threshold table to the default values.

Use Shared Threshold Table	Allows you to use a color table that is defined in globals or any color table that is defined in a picture, which will be open in conjunction with the current picture.
Shared Table	Allows you to enter the data source for the shared color table. The shared table data source must be a color threshold table found in the global user page or in another picture.

#### Historical Properties Tab

The Historical Properties tab allows you to set the parameters for a query that fetches historical data from GE Historian. The tab contains the following items:

**NOTE:** The following fields, with the exception of the Update Rate fields, are only available if you select a Historical Mode other than Current Value.

#### Start Date

Item	Description
Fixed Date	Specifies whether to enter a specific start date for the query of the data source.
Days Before Now	Specifies whether to enter the number of days prior to today to fetch data from GE Historian. For example, if you want to display data collected for the data source two days ago, enter 2.

#### Start Time

Item	Description
Fixed Time	Specifies whether to designate a specific time to start. If selected, allows you to enter an explicit start time.
Lock Time	Locks the Fixed Time, even if you change the time zone in the Date and Time Properties dialog box in the Control Panel. This field is available only when you designate a specific time to start using the Fixed Time field.
Duration Before Now	Specifies whether to enter the duration prior to the current time to start. The minimum duration is 0 seconds; the maximum is 23 hours, 59 minutes, and 59 seconds.

#### Time Zone

Item	Description
Time Zone	Allows you to select the time zone to associate with the start time. You can select the client time (time zone for your computer), the server time (time zone used by the Historian server), or the tag time (uses the time zone bias of the tag, which is set in Historian). The default time zone is that of the client machine. This field is available only when Historian is used.

Adjust for Daylight Savings Time	Adjusts the time if the zone you selected is experiencing daylight saving. This field works only if you selected the Automatically adjust clock for daylight saving changes check box located on the Time Zone tab of the Date/Time Properties dialog box in the Control Panel.
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## Historical Mode

Allows you to determine how iFIX selects and fetches data from a historical data source and, determines what each displayed value represents. The options are:

- Sample - The last valid value found, up to and including the start of the specified interval.
- Avg - The average of all valid data found during the specified interval.
- High - The highest valid data point value found during the specified interval.
- Low - The lowest valid data point value found during the specified interval.
- Interpolated - The data is interpreted by assuming that the line between two values is a straight line. All points along that line are estimated except the starting point and the ending point.
- Current Value - The current value of the data point.

**IMPORTANT:** The Current Value may update at a rate different from the rate set in the Update Rate field. The update rate is not set solely by the rate entered in the Update Rate field. It also depends on the collection rate, the rate for querying Historian, and the time required to request an update from the Historian server and send it back to the client. As a result, the time it takes to display the updates may be longer than anticipated. Additionally, please be aware that the timestamp for this mode represents the timestamp from the Historian server, not the client.

- Standard Deviation - The standard deviation of all valid data found during the specified interval.
- Total - The total of all valid data found during the specified interval.

## Duration

The duration determines the time range for the historical data source. The minimum duration for a fetch is one second; the maximum is 999 days, 23 hours, 59 minutes, and 59 seconds.

Item	Description
Days	Allows you to enter the number of days. This field can be used in conjunction with the other fields in this area.
Hours	Allows you to enter the number of hours for the duration for the data fetch query. This field can be used in conjunction with the other fields in this area.
Mins	Allows you to enter the number of minutes for the duration for the data fetch query. This field can be used in conjunction with the other fields in this area.
Secs	Allows you to enter the number of seconds for the duration for the data fetch query. This field can be used in conjunction with the other fields in this area.

## Update Rate

Allows you to specify the rate at which the data is updated. The default rate is five seconds. Zero is permitted for a one-time fetch. The fastest update rate is five seconds, the slowest, 1:59:59.

Item	Description
Hours	Allows you to enter the number of hours for the rate of data update. This field can be used in conjunction with the other fields in this area.
Mins	Allows you to enter the number of minutes for the rate of data update. This field can be used in conjunction with the other fields in this area.
Secs	Allows you to enter the number of seconds for the rate of data update. This field can be used in conjunction with the other fields in this area.

### Get Data From New Selection

Allows you to select a different object in the Workspace while the Color Expert is still displayed. Click this button and that object's color animation parameters appear in the Color Expert. You can then apply the parameters to a new selection.

### Fill Expert

Lets you set the way the horizontal or vertical fill for the selected object(s) is animated in the runtime environment.

#### Data Source

Allows you to enter the data source that animates the selected object's fill property. Click the browse button (...) to view all of data sources available in your system. Click the down button to view the last data sources you used. Click the modify database block button to modify the selected data source. You can add a database block by entering a new database block tag name and tabbing off this field. The Quick Add dialog box appears and allows you to enter the appropriate values for the added block.

#### Fill Properties

### Direction

Fills the selected object(s) vertically. You can select the Vertical and Horizontal check boxes to fill the selected object(s) both horizontally and vertically.

Item	Description
Vertical	Fills the selected object(s) vertically. You can select the Vertical and Horizontal check boxes to fill the selected object(s) both horizontally and vertically.
Horizontal	Fills the selected object(s) horizontally.

## Direction Settings

Item	Description
Vertical Fill Direction	Sets the vertical fill direction: Bottom to Top, Top to Bottom, Top and Bottom from Center.
Horizontal Fill Direction	Sets the horizontal fill direction: Left to Right, Right to Left, Left and Right from Center.

## Input Ranges

Item	Description
Lowest Input Value	Sets the minimum input value from the data source. The valid range is dependent on the valid range of the data source. The default value is 0.
Highest Input Value	Sets the maximum input value from the data source. The valid range is dependent on the valid range of the data source. The default value is 100.
Fetch Limits at Runtime	Fetches the low and high EGU limits from the data source automatically at runtime.  <b>NOTE:</b> Fetching data limits at runtime for an expression with more than one data source is not supported and may produce unexpected results at runtime. This is because there could be different tag names in the expression and it may not be clear which tag to fetch the limits for.

## Fill Percentages

Item	Description
Minimum Percentage	Allows you to calculate the amount you want the object filled when the data source equals the lowest input value.
Maximum Percentage	Allows you to calculate the amount you want the object filled when the data source equals the highest input value.

### Historical Properties Tab

The Historical Properties tab allows you to set the parameters for a query that fetches historical data from GE Historian. The tab contains the following items:

**NOTE:** The following fields, with the exception of the Update Rate fields, are only available if you select a Historical Mode other than Current Value.

## Start Date

Item	Description
Fixed Date	Specifies whether to enter a specific start date for the query of the data source.
Days Before Now	Specifies whether to enter the number of days prior to today to fetch data from GE Historian. For example, if you want to display data collected for the data source two days ago, enter 2.

## Start Time

Item	Description
Fixed Time	Specifies whether to designate a specific time to start. If selected, allows you to enter an explicit start time.
Lock Time	Locks the Fixed Time, even if you change the time zone in the Date and Time Properties dialog box in the Control Panel. This field is available only when you designate a specific time to start using the Fixed Time field.
Duration Before Now	Specifies whether to enter the duration prior to the current time to start. The minimum duration is 0 seconds; the maximum is 23 hours, 59 minutes, and 59 seconds.

## Time Zone

Item	Description
Time Zone	Allows you to select the time zone to associate with the start time. You can select the client time (time zone for your computer), the server time (time zone used by the Historian server), or the tag time (uses the time zone bias of the tag, which is set in Historian). The default time zone is that of the client machine. This field is available only when Historian is used.
Adjust for Daylight Savings Time	Adjusts the time if the zone you selected is experiencing daylight saving. This field works only if you selected the Automatically adjust clock for daylight saving changes check box located on the Time Zone tab of the Date/Time Properties dialog box in the Control Panel.

## Historical Mode

Allows you to determine how iFIX selects and fetches data from a historical data source and, determines what each displayed value represents. The options are:

- Sample - The last valid value found, up to and including the start of the specified interval.
- Avg - The average of all valid data found during the specified interval.
- High - The highest valid data point value found during the specified interval.
- Low - The lowest valid data point value found during the specified interval.

- Interpolated - The data is interpreted by assuming that the line between two values is a straight line. All points along that line are estimated except the starting point and the ending point.
- Current Value - The current value of the data point.

**IMPORTANT:** The Current Value may update at a rate different from the rate set in the Update Rate field. The update rate is not set solely by the rate entered in the Update Rate field. It also depends on the collection rate, the rate for querying Historian, and the time required to request an update from the Historian server and send it back to the client. As a result, the time it takes to display the updates may be longer than anticipated. Additionally, please be aware that the timestamp for this mode represents the timestamp from the Historian server, not the client.

- Standard Deviation - The standard deviation of all valid data found during the specified interval.
- Total - The total of all valid data found during the specified interval.

## Duration

The duration determines the time range for the historical data source. The minimum duration for a fetch is one second; the maximum is 999 days, 23 hours, 59 minutes, and 59 seconds.

Item	Description
Days	Allows you to enter the number of days. This field can be used in conjunction with the other fields in this area.
Hours	Allows you to enter the number of hours for the duration for the data fetch query. This field can be used in conjunction with the other fields in this area.
Mins	Allows you to enter the number of minutes for the duration for the data fetch query. This field can be used in conjunction with the other fields in this area.
Secs	Allows you to enter the number of seconds for the duration for the data fetch query. This field can be used in conjunction with the other fields in this area.

## Update Rate

Allows you to specify the rate at which the data is updated. The default rate is five seconds. Zero is permitted for a one-time fetch. The fastest update rate is five seconds, the slowest, 1:59:59.

Item	Description
Hours	Allows you to enter the number of hours for the rate of data update. This field can be used in conjunction with the other fields in this area.
Mins	Allows you to enter the number of minutes for the rate of data update. This field can be used in conjunction with the other fields in this area.
Secs	Allows you to enter the number of seconds for the rate of data update. This field can be used in conjunction with the other fields in this area.

#### **Get Data From New Selection**

Allows you to select a different object in the Workspace while the Fill Expert is still displayed. Click this button and that object's fill animation parameters appear in the Fill Expert. You can then apply the parameters to a new selection.

#### **Position Expert**

Lets you set the way the selected object(s) vertical or horizontal position is animated in the runtime environment.

##### **Data Source**

Allows you to enter the data source that animates the selected object's position property. Click the browse button (...) to view all of data sources available in your system. Click the down button to view the last data sources you used. Click the modify database block button to modify the selected data source. You can add a database block by entering a new database block tag name and tabbing off this field. The Quick Add dialog box appears and allows you to enter the appropriate values for the added block.

##### **Position Properties Tab**

## **Position**

Item	Description
Vertical	Moves the selected object(s) vertically. You can select the Vertical and Horizontal check boxes to move the selected object(s) both horizontally and vertically.
Horizontal	Moves the selected object(s) horizontally. You can select the Vertical and Horizontal check boxes to move the selected object(s) both horizontally and vertically.

## **Position Type**

Item	Description
Relative	Allows you to set the selected object(s) start and end positions relative to its current position in the runtime environment.
Absolute	Allows you to make the selected object(s) movement always start and end in the same position.

## **Input Values**

Item	Description
Lowest Input	Sets the minimum input value from the data source. The valid range is dependent on the valid range of the data source. The default value is 0.

Value	
Highest Input Value	Sets the maximum input value from the data source. The valid range is dependent on the valid range of the data source. The default value is 100.
Fetch Limits at Runtime	<p>Fetches the Low and High EGU limits from the data source automatically at runtime.</p> <p><b>NOTE:</b> Fetching data limits at runtime for an expression with more than one data source is not supported and may produce unexpected results at runtime. This is because there could be different tag names in the expression and it may not be clear which tag to fetch the limits for.</p>

## Horizontal Position Output Values

Item	Description
Minimum Offset	<p>Allows you to modify the distance that you want the object to move from its origin when the data source value equals the lowest input value. Available when you select the Relative Position.</p> <p>This item is only available when the Relative option is selected.</p>
Maximum Offset	<p>Allows you to specify the distance you want the object to move from its origin when the data source value equals the highest input value.</p> <p>This item is only available when the Relative option is selected.</p>
Start	<p>Allows you to specify the position in the iFIX Workspace that you want the object to move to when the data source value equals the lowest input value. Available when you select Absolute as the position type.</p> <p>This item is only available when the Absolute option is selected.</p>
End	<p>Allows you to specify the position in the iFIX Workspace that you want the object to move to when the data source value equals the highest input value. Available when you select Absolute as the position type.</p> <p>This item is only available when the Absolute option is selected.</p>
Get Value Button (Minimum Offset)	Allows you to select the object(s) in the iFIX Workspace and move the object(s) to the start or minimum offset position that you want. The position is entered in the field to the left.
Get Value Button (Maximum	Allows you to select the object(s) in the iFIX Workspace and move the object(s) to the end or maximum offset position that you want. The position is entered in the field to the left.

Offset)

#### Historical Properties Tab

The Historical Properties tab allows you to set the parameters for a query that fetches historical data from GE Historian. The tab contains the following items:

**NOTE:** The following fields, with the exception of the Update Rate fields, are only available if you select a Historical Mode other than Current Value.

#### Start Date

Item	Description
Fixed Date	Specifies whether to enter a specific start date for the query of the data source.
Days Before Now	Specifies whether to enter the number of days prior to today to fetch data from GE Historian. For example, if you want to display data collected for the data source two days ago, enter 2.

#### Start Time

Item	Description
Fixed Time	Specifies whether to designate a specific time to start. If selected, allows you to enter an explicit start time.
Lock Time	Locks the Fixed Time, even if you change the time zone in the Date and Time Properties dialog box in the Control Panel. This field is available only when you designate a specific time to start using the Fixed Time field.
Duration Before Now	Specifies whether to enter the duration prior to the current time to start. The minimum duration is 0 seconds; the maximum is 23 hours, 59 minutes, and 59 seconds.

#### Time Zone

Item	Description
Time Zone	Allows you to select the time zone to associate with the start time. You can select the client time (time zone for your computer), the server time (time zone used by the Historian server), or the tag time (uses the time zone bias of the tag, which is set in Historian). The default time zone is that of the client machine. This field is available only when Historian is used.
Adjust for Daylight Savings Time	Adjusts the time if the zone you selected is experiencing daylight saving. This field works only if you selected the Automatically adjust clock for daylight saving changes check box located on the Time Zone tab of the Date/Time Properties dialog box in the Control Panel.

## Historical Mode

Allows you to determine how iFIX selects and fetches data from a historical data source and, determines what each displayed value represents. The options are:

- Sample - The last valid value found, up to and including the start of the specified interval.
- Avg - The average of all valid data found during the specified interval.
- High - The highest valid data point value found during the specified interval.
- Low - The lowest valid data point value found during the specified interval.
- Interpolated - The data is interpreted by assuming that the line between two values is a straight line. All points along that line are estimated except the starting point and the ending point.
- Current Value - The current value of the data point.

**IMPORTANT:** The Current Value may update at a rate different from the rate set in the Update Rate field. The update rate is not set solely by the rate entered in the Update Rate field. It also depends on the collection rate, the rate for querying Historian, and the time required to request an update from the Historian server and send it back to the client. As a result, the time it takes to display the updates may be longer than anticipated. Additionally, please be aware that the timestamp for this mode represents the timestamp from the Historian server, not the client.

- Standard Deviation - The standard deviation of all valid data found during the specified interval.
- Total - The total of all valid data found during the specified interval.

## Duration

The duration determines the time range for the historical data source. The minimum duration for a fetch is one second; the maximum is 999 days, 23 hours, 59 minutes, and 59 seconds.

Item	Description
Days	Allows you to enter the number of days. This field can be used in conjunction with the other fields in this area.
Hours	Allows you to enter the number of hours for the duration for the data fetch query. This field can be used in conjunction with the other fields in this area.
Mins	Allows you to enter the number of minutes for the duration for the data fetch query. This field can be used in conjunction with the other fields in this area.
Secs	Allows you to enter the number of seconds for the duration for the data fetch query. This field can be used in conjunction with the other fields in this area.

## Update Rate

Allows you to specify the rate at which the data is updated. The default rate is five seconds. Zero is permitted for a one-time fetch. The fastest update rate is five seconds, the slowest, 1:59:59.

Item	Description
Hours	Allows you to enter the number of hours for the rate of data

	update. This field can be used in conjunction with the other fields in this area.
Mins	Allows you to enter the number of minutes for the rate of data update. This field can be used in conjunction with the other fields in this area.
Secs	Allows you to enter the number of seconds for the rate of data update. This field can be used in conjunction with the other fields in this area.

#### Get Data from New Selection

Allows you to select a different object in the Workspace while the Position Expert is still displayed. Click this button and that object's position animation parameters appear in the Position Expert. You can then apply the parameters to a new selection.

#### Rotate Expert

Lets you set the way the selected object(s) rotate in the runtime environment.

##### Data Source

Allows you to enter the data source that animates the selected object's rotate property. Click the browse button (...) to view all of data sources available in your system. Click the down button to view the last data sources you used. Click the modify database block button to modify the selected data source. You can add a database block by entering a new database block tag name and tabbing off this field. The Quick Add dialog box appears and allows you to enter the appropriate values for the added block.

##### Rotate Properties Tab

#### Input

Item	Description
Lowest Input Value	Sets the minimum input value from the data source. The valid range is dependent on the valid range of the data source. The default value is 0.
Highest Input Value	Sets the maximum input value from the data source. The valid range is dependent on the valid range of the data source. The default value is 100.
Fetch Limits at Runtime	Fetches the Low and High EGU limits from the data source at runtime. <b>NOTE:</b> Fetching data limits at runtime for an expression with more than one data source is not supported and may produce unexpected results at runtime. This is because there could be different tag names in the expression and it may not be clear which tag to fetch the limits for.

#### Output

Item	Description

Minimum Angle of Rotation in Degrees	Allows you to enter the value, in degrees, of the angle that you want the object to rotate to when the data source equals the lowest input value. The default value is 0.
Maximum Angle of Rotation in Degrees	Allows you to enter the value, in degrees, of the angle that you want the object to rotate to when the data source equals the highest input value. The default value is 360.
	<b>NOTE:</b> When the Minimum Angle is set to 0 and the Maximum Angle is set to 360, the selected object(s) rotate counter clockwise. When the Minimum Angle is set to 360 and the Maximum Angle is set to 0, the selected object(s) rotate clockwise.

#### Historical Properties Tab

The Historical Properties tab allows you to set the parameters for a query that fetches historical data from GE Historian. The tab contains the following items:

**NOTE:** The following fields, with the exception of the Update Rate fields, are only available if you select a Historical Mode other than Current Value.

#### Start Date

Item	Description
Fixed Date	Specifies whether to enter a specific start date for the query of the data source.
Days Before Now	Specifies whether to enter the number of days prior to today to fetch data from GE Historian. For example, if you want to display data collected for the data source two days ago, enter 2.

#### Start Time

Item	Description
Fixed Time	Specifies whether to designate a specific time to start. If selected, allows you to enter an explicit start time.
Lock Time	Locks the Fixed Time, even if you change the time zone in the Date and Time Properties dialog box in the Control Panel. This field is available only when you designate a specific time to start using the Fixed Time field.
Duration Before Now	Specifies whether to enter the duration prior to the current time to start. The minimum duration is 0 seconds; the maximum is 23 hours, 59 minutes, and 59 seconds.

## Time Zone

Item	Description
Time Zone	Allows you to select the time zone to associate with the start time. You can select the client time (time zone for your computer), the server time (time zone used by the Historian server), or the tag time (uses the time zone bias of the tag, which is set in Historian). The default time zone is that of the client machine. This field is available only when Historian is used.
Adjust for Daylight Savings Time	Adjusts the time if the zone you selected is experiencing daylight saving. This field works only if you selected the Automatically adjust clock for daylight saving changes check box located on the Time Zone tab of the Date/Time Properties dialog box in the Control Panel.

## Historical Mode

Allows you to determine how iFIX selects and fetches data from a historical data source and, determines what each displayed value represents. The options are:

- Sample - The last valid value found, up to and including the start of the specified interval.
- Avg - The average of all valid data found during the specified interval.
- High - The highest valid data point value found during the specified interval.
- Low - The lowest valid data point value found during the specified interval.
- Interpolated - The data is interpreted by assuming that the line between two values is a straight line. All points along that line are estimated except the starting point and the ending point.
- Current Value - The current value of the data point.

**IMPORTANT:** The Current Value may update at a rate different from the rate set in the Update Rate field. The update rate is not set solely by the rate entered in the Update Rate field. It also depends on the collection rate, the rate for querying Historian, and the time required to request an update from the Historian server and send it back to the client. As a result, the time it takes to display the updates may be longer than anticipated. Additionally, please be aware that the timestamp for this mode represents the timestamp from the Historian server, not the client.

- Standard Deviation - The standard deviation of all valid data found during the specified interval.
- Total - The total of all valid data found during the specified interval.

## Duration

The duration determines the time range for the historical data source. The minimum duration for a fetch is one second; the maximum is 999 days, 23 hours, 59 minutes, and 59 seconds.

Item	Description
Days	Allows you to enter the number of days. This field can be used in conjunction with the other fields in this area.
Hours	Allows you to enter the number of hours for the duration for the data fetch query. This field can be used in conjunction with the other fields in this area.

Mins	Allows you to enter the number of minutes for the duration for the data fetch query. This field can be used in conjunction with the other fields in this area.
Secs	Allows you to enter the number of seconds for the duration for the data fetch query. This field can be used in conjunction with the other fields in this area.

### Update Rate

Allows you to specify the rate at which the data is updated. The default rate is five seconds. Zero is permitted for a one-time fetch. The fastest update rate is five seconds, the slowest, 1:59:59.

Item	Description
Hours	Allows you to enter the number of hours for the rate of data update. This field can be used in conjunction with the other fields in this area.
Mins	Allows you to enter the number of minutes for the rate of data update. This field can be used in conjunction with the other fields in this area.
Secs	Allows you to enter the number of seconds for the rate of data update. This field can be used in conjunction with the other fields in this area.

### Get Data from New Selection

Allows you to select a different object in the Workspace while the Rotate Expert is still displayed. Click this button and that object's rotate animation parameters appear in the Rotate Expert. You can then apply the parameters to a new selection.

### Scale Expert

Lets you set the way the selected object(s) scale is animated in the runtime environment.

#### Data Source

Allows you to enter the data source that animates the selected object's scale property. Click the browse button (...) to view all of data sources available in your system. Click the down button to view the last data sources you used. Click the modify database block button to modify the selected data source. You can add a database block by entering a new database block tag name and tabbing off this field. The Quick Add dialog box appears and allows you to enter the appropriate values for the added block.

#### Scale Properties Tab

### Scale Parameters

Item	Description
Dimension to Scale	Lets you select the dimension of the object to scale. <b>Valid Entries:</b> Uniform Height and Width, Height, Width

Scale Direction	Lets you select the direction to scale the object. The options are dependent on which dimension you choose to scale.
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## Input

Item	Description
Lowest Input Value	Sets the minimum input value from the data source. The valid range is dependent on the valid range of the data source. The default value is 0.
Highest Input Value	Sets the maximum input value from the data source. The valid range is dependent on the valid range of the data source. The default value is 100.
Fetch Limits at Runtime	Fetches the Low and High EGU limits from the data source at runtime. <b>NOTE:</b> Fetching data limits at runtime for an expression with more than one data source is not supported and may produce unexpected results at runtime. This is because there could be different tag names in the expression and it may not be clear which tag to fetch the limits for.

## Output

Item	Description
Minimum Percentage	Allows you to enter the value, in degrees, of the amount that you want the object to scale to when the data source equals the lowest input value.
Maximum Percentage	Allows you to enter the value, in degrees, of the amount that you want the object to scale to when the data source equals the highest input value.

### Historical Properties Tab

The Historical Properties tab allows you to set the parameters for a query that fetches historical data from GE Historian. The tab contains the following items:

**NOTE:** The following fields, with the exception of the Update Rate fields, are only available if you select a Historical Mode other than Current Value.

### Start Date

Item	Description
Fixed Date	Specifies whether to enter a specific start date for the query of the data source.
Days Before Now	Specifies whether to enter the number of days prior to today to fetch data from GE Historian. For example, if you want to display data collected for the data source two days ago, enter 2.

## Start Time

Item	Description
Fixed Time	Specifies whether to designate a specific time to start. If selected, allows you to enter an explicit start time.
Lock Time	Locks the Fixed Time, even if you change the time zone in the Date and Time Properties dialog box in the Control Panel. This field is available only when you designate a specific time to start using the Fixed Time field.
Duration Before Now	Specifies whether to enter the duration prior to the current time to start. The minimum duration is 0 seconds; the maximum is 23 hours, 59 minutes, and 59 seconds.

## Time Zone

Item	Description
Time Zone	Allows you to select the time zone to associate with the start time. You can select the client time (time zone for your computer), the server time (time zone used by the Historian server), or the tag time (uses the time zone bias of the tag, which is set in Historian). The default time zone is that of the client machine. This field is available only when Historian is used.
Adjust for Daylight Savings Time	Adjusts the time if the zone you selected is experiencing daylight saving. This field works only if you selected the Automatically adjust clock for daylight saving changes check box located on the Time Zone tab of the Date/Time Properties dialog box in the Control Panel.

## Historical Mode

Allows you to determine how iFIX selects and fetches data from a historical data source and, determines what each displayed value represents. The options are:

- Sample - The last valid value found, up to and including the start of the specified interval.
- Avg - The average of all valid data found during the specified interval.
- High - The highest valid data point value found during the specified interval.
- Low - The lowest valid data point value found during the specified interval.
- Interpolated - The data is interpreted by assuming that the line between two values is a straight line. All points along that line are estimated except the starting point and the ending point.
- Current Value - The current value of the data point.

**IMPORTANT:** The Current Value may update at a rate different from the rate set in the Update Rate field. The update rate is not set solely by the rate entered in the Update Rate field. It also depends on the collection rate, the rate for querying Historian, and the time required to request an update from the Historian server and send it back to the client. As a result, the time it takes to display the updates may be longer than anticipated. Additionally, please be aware that the timestamp for this mode represents the timestamp from the Historian server, not the client.

- Standard Deviation - The standard deviation of all valid data found during the specified interval.
- Total - The total of all valid data found during the specified interval.

## Duration

The duration determines the time range for the historical data source. The minimum duration for a fetch is one second; the maximum is 999 days, 23 hours, 59 minutes, and 59 seconds.

Item	Description
Days	Allows you to enter the number of days. This field can be used in conjunction with the other fields in this area.
Hours	Allows you to enter the number of hours for the duration for the data fetch query. This field can be used in conjunction with the other fields in this area.
Mins	Allows you to enter the number of minutes for the duration for the data fetch query. This field can be used in conjunction with the other fields in this area.
Secs	Allows you to enter the number of seconds for the duration for the data fetch query. This field can be used in conjunction with the other fields in this area.

## Update Rate

Allows you to specify the rate at which the data is updated. The default rate is five seconds. Zero is permitted for a one-time fetch. The fastest update rate is five seconds, the slowest, 1:59:59.

Item	Description
Hours	Allows you to enter the number of hours for the rate of data update. This field can be used in conjunction with the other fields in this area.
Mins	Allows you to enter the number of minutes for the rate of data update. This field can be used in conjunction with the other fields in this area.
Secs	Allows you to enter the number of seconds for the rate of data update. This field can be used in conjunction with the other fields in this area.

## Get Data from New Selection

Allows you to select a different object in the Workspace while the Scale Expert is still displayed. Click this button and that object's scale animation parameters appear in the Scale Expert. You can then apply the parameters to a new selection.

## Visibility Expert

Lets you set the visibility conditions for the selected object(s) in the runtime environment.

#### **Data Source**

Allows you to enter the data source that animates the selected object's visibility property. Click the browse button (...) to view all of data sources available in your system. Click the down button to view the last data sources you used. Click the modify database block button to modify the selected data source. You can add a database block by entering a new database block tag name and tabbing off this field. The Quick Add dialog box appears and allows you to enter the appropriate values for the added block.

#### **Visibility Properties Tab**

### **Condition for Visibility**

#### **Condition**

Lets you select the desired logical comparison. The selected object is visible when:

- < Data source value is less than the entry in the Value field.
- > Data source value is greater than the entry in the Value field.
- = Data source value equals the entry in the Value field. This comparison lets you enter a Tolerance amount.
- <= Data source value is less than or equal to the entry in the Value field.
- >= Data source value is greater than or equal to the entry in the Value field.
- <> Data source value is not equal to the entry in the Value field.

#### **Condition Value**

Enter the number you want to compare with the data source value.

**NOTE:** Scientific notation cannot be used to specify the Condition Value.

#### **Tolerance**

Allows you to enter the allowable deviation from the entry in the Value field.

### **Condition Expression**

#### **View Visibility Condition**

Click this button to view the condition you set in the Visibility Condition field.

#### **Visibility Condition**

When you click the View Visibility Condition button, this field displays the visibility condition you have set.

The Historical Properties tab contains the following items:

#### **Historical Properties Tab**

The Historical Properties tab allows you to set the parameters for a query that fetches historical data from GE Historian. The tab contains the following items:

**NOTE:** The following fields, with the exception of the Update Rate fields, are only available if you select a Historical Mode other than Current Value.

## Start Date

Item	Description
Fixed Date	Specifies whether to enter a specific start date for the query of the data source.
Days Before Now	Specifies whether to enter the number of days prior to today to fetch data from GE Historian. For example, if you want to display data collected for the data source two days ago, enter 2.

## Start Time

Item	Description
Fixed Time	Specifies whether to designate a specific time to start. If selected, allows you to enter an explicit start time.
Lock Time	Locks the Fixed Time, even if you change the time zone in the Date and Time Properties dialog box in the Control Panel. This field is available only when you designate a specific time to start using the Fixed Time field.
Duration Before Now	Specifies whether to enter the duration prior to the current time to start. The minimum duration is 0 seconds; the maximum is 23 hours, 59 minutes, and 59 seconds.

## Time Zone

Item	Description
Time Zone	Allows you to select the time zone to associate with the start time. You can select the client time (time zone for your computer), the server time (time zone used by the Historian server), or the tag time (uses the time zone bias of the tag, which is set in Historian). The default time zone is that of the client machine. This field is available only when Historian is used.
Adjust for Daylight Savings Time	Adjusts the time if the zone you selected is experiencing daylight saving. This field works only if you selected the Automatically adjust clock for daylight saving changes check box located on the Time Zone tab of the Date/Time Properties dialog box in the Control Panel.

## Historical Mode

Allows you to determine how iFIX selects and fetches data from a historical data source and, determines what each displayed value represents. The options are:

- Sample - The last valid value found, up to and including the start of the specified interval.
- Avg - The average of all valid data found during the specified interval.
- High - The highest valid data point value found during the specified interval.
- Low - The lowest valid data point value found during the specified interval.

- Interpolated - The data is interpreted by assuming that the line between two values is a straight line. All points along that line are estimated except the starting point and the ending point.
- Current Value - The current value of the data point.

**IMPORTANT:** The Current Value may update at a rate different from the rate set in the Update Rate field. The update rate is not set solely by the rate entered in the Update Rate field. It also depends on the collection rate, the rate for querying Historian, and the time required to request an update from the Historian server and send it back to the client. As a result, the time it takes to display the updates may be longer than anticipated. Additionally, please be aware that the timestamp for this mode represents the timestamp from the Historian server, not the client.

- Standard Deviation - The standard deviation of all valid data found during the specified interval.
- Total - The total of all valid data found during the specified interval.

## Duration

The duration determines the time range for the historical data source. The minimum duration for a fetch is one second; the maximum is 999 days, 23 hours, 59 minutes, and 59 seconds.

Item	Description
Days	Allows you to enter the number of days. This field can be used in conjunction with the other fields in this area.
Hours	Allows you to enter the number of hours for the duration for the data fetch query. This field can be used in conjunction with the other fields in this area.
Mins	Allows you to enter the number of minutes for the duration for the data fetch query. This field can be used in conjunction with the other fields in this area.
Secs	Allows you to enter the number of seconds for the duration for the data fetch query. This field can be used in conjunction with the other fields in this area.

## Update Rate

Allows you to specify the rate at which the data is updated. The default rate is five seconds. Zero is permitted for a one-time fetch. The fastest update rate is five seconds, the slowest, 1:59:59.

Item	Description
Hours	Allows you to enter the number of hours for the rate of data update. This field can be used in conjunction with the other fields in this area.
Mins	Allows you to enter the number of minutes for the rate of data update. This field can be used in conjunction with the other fields in this area.
Secs	Allows you to enter the number of seconds for the rate of data update. This field can be used in conjunction with the other fields in this area.

## Display Layers Expert

Lets you view only the layers that you want.

#### **Layer Numbers**

Allows you to select the layer numbers to display. The button for the selected layer appears depressed.

#### **Select All Layers**

Allows all of the layers to be displayed.

#### **Deselect All Layers**

Allows none of the layers to be displayed.

#### **Set Layer Expert**

Lets you set which layers the selected object(s) display in. For example, if you have a series of objects that make up the foreground of a picture and another series of objects that make up the background, you can set the layer for the foreground objects to Level 1 and set the layer for the background objects to Level 2. Then you can display just the foreground objects, just the background objects, or both at the same time. See the Display Layer Expert for information on displaying layers.

#### **Layer Numbers**

Allows you to select the layer number for the selected object. The object is displayed when that display layer is set. The button for the selected layer appears depressed.

#### **Allow Multiple Layers**

Lets you select additional layers for the object to appear.

#### **Select All**

Allows you to specify that the object will display in every layer. This button is enabled only if you selected the Allow for Multiple Layers check box.

#### **Deselect All**

Allows the user to specify that the object will not display in any layer. This button is enabled only if you select the Allow for Multiple Layers check box.

### **Command Experts**

The following list summarizes the Command Experts available in iFIX. You can select a single command Expert from the Experts toolbar, or you can use the Multiple Command Script Wizard to build an object's command script with more than one Command Expert.

- [Acknowledge Alarm](#)
- [Acknowledge All Alarms](#)
- [Alarm Horn](#)
- [Close Digital Tag](#)
- [Close Picture](#)
- [Disable Alarm](#)

- [Enable Alarm](#)
- [Locate Object](#)
- [Open Digital Tag](#)
- [Open Picture](#)
- [Print Crystal Report](#)
- [Ramp Tag Value](#)
- [Replace Picture](#)
- [Set Tag Auto](#)
- [Set Tag Manual](#)
- [Shelve Expert](#)
- [Toggle Digital Tag](#)
- [Toggle Tag Auto/Manual](#)
- [Toggle Scan](#)
- [Turn Tag Off Scan](#)
- [Turn Tag On Scan](#)
- [Unshelve Expert](#)
- [Write Value to Tag](#)

#### **Acknowledge Alarm Expert**

Acknowledges a new alarm for the specified database tag. This expert uses the AcknowledgeAlarm subroutine.

##### **Data Source**

Allows you to enter the data source whose alarm you want to acknowledge. Click the browse button (...) to view all of data sources available in your system. Click the down button to view the last data sources you used. Click the Modify Database Block button to modify the selected data source. You can add a database block by entering a new database block tag name and tabbing off this field. The Quick Add dialog box appears and allows you to enter the appropriate values for the added block.

##### **Use Database Tags**

Allows you to acknowledge the alarms only on the selected object's database tags. To make an object selectable, open the object's property page and set the property 'IsSelectable' to True.

**NOTE:** Before the action can be performed in the runtime environment, you must first click on the object to select it.

#### **Acknowledge All Alarms Expert**

Acknowledges all new alarms in the specified picture. This expert uses the AcknowledgeAllAlarms subroutine.

**Picture Name**

Allows you to specify the name of the picture whose alarms you want to acknowledge. Click the browse button (...) to view all of the pictures available in your iFIX picture path.

**Browse Button (...)**

Allows you to view all of the saved pictures in your iFIX picture path.

**Acknowledge All Alarms in Picture**

Allows you to acknowledge all of the alarms in the current picture. When this check box is enabled, the Picture Name field is disabled.

**Alarm Horn Expert**

Lets you configure an object to enable, disable, or silence the alarm horn. You can also toggle the alarm horn between enable and disable, and prompt for horn status in run mode. This expert uses the following subroutines:

- AlarmHornEnabled
- AlarmHornEnabledToggle
- AlarmHornSilence

**Silence Horn**

Silences the alarm horn for the current set of alarms.

**Enable Horn**

Enables the alarm horn.

**Disable Horn**

Disables the alarm horn.

**Toggle Horn Enable**

Toggles the alarm horn between enabled and disabled.

**Prompt for Horn Status in Run Mode**

Displays a dialog box in run mode that shows the current status of the Alarm Horn. You can also silence the alarm horn from this dialog box.

**Close Digital Tag Expert**

Closes the specified digital tag. This expert uses the CloseDigitalPoint subroutine.

**Data Source**

Allows you to enter the digital tag you want to close (for example, set to 1). Click the browse button (...) to view all of data sources available in your system. Click the down button to view the last data sources you used. Click the Modify Database Block button to modify the selected data source. You can add a database block by entering a new database block tag name and tabbing off this field. The Quick Add dialog box appears and allows you to enter the appropriate values for the added block.

#### **Use Database Tags**

Allows you to close only the selected object's digital blocks. To make an object selectable, open the object's property page and set the property 'IsSelectable' to True.

**NOTE:** Before the action can be performed in the runtime environment, you must first click on the object to select it.

#### **Close Picture Expert**

Closes the specified picture. If there are multiple instances of a picture open, all instances of that picture are closed. This expert uses the ClosePicture subroutine.

##### **Picture Name**

Allows you to specify the name of the picture you want to close. Click the browse button (...) to view all of the pictures available in your iFIX picture path.

##### **Browse (...)**

Allows you to view all of the saved pictures in your iFIX picture path.

##### **Use Alias**

Allows you to use the picture's alias name instead of its filename.

##### **Picture Alias**

Allows you to enter an optional alias for your picture instead of the name from the Picture Name field.

##### **Close This Picture**

Allows you to close the current picture in the runtime environment. When this check box is enabled, the Picture Name field is disabled.

#### **Disable Alarm Expert**

Disables the alarm for the specified database tag. This expert uses the DisableAlarm subroutine.

##### **Data Source**

Allows you to enter the data source whose alarm you want to disable. Click the browse button (...) to view all of data sources available in your system. Click the down button to view the last data sources you used. Click the Modify Database Block button to modify the selected data source. You can add a database block by entering a new database block tag name and tabbing off this field. The Quick Add dialog box appears and allows you to enter the appropriate values for the added block.

##### **Use Database Tags**

Allows you to disable the alarms only on the selected object's database tags. To make an object selectable, open the object's property page and set the property 'IsSelectable' to True.

**NOTE:** Before the action can be performed in the runtime environment, you must first click on the object to select it.

#### **Enable Alarm Expert**

Enables the alarm for the specified database tag. This expert uses the EnableAlarm subroutine.

#### **Data Source**

Allows you to enter the data source whose alarm you want to enable. Click the browse button (...) to view all of data sources available in your system. Click the down button to view the last data sources you used. Click the Modify Database Block button to modify the selected data source. You can add a database block by entering a new database block tag name and tabbing off this field. The Quick Add dialog box appears and allows you to enter the appropriate values for the added block.

#### **Use Database Tags**

Allows you to enable the alarms only on the selected object's database tags. To make an object selectable, open the object's property page and set the property 'IsSelectable' to True.

**NOTE:** Before the action can be performed in the runtime environment, you must first click on the object to select it.

#### **Locate Object Expert**

Finds the object you specify. You can set it to find the object in one picture or in all open pictures. This expert uses the LocateObject subroutine.

##### **Object Name**

Allows you to specify the name of the object that you want to locate.

##### **Search Active Document**

Allows you to search for the object in the currently active document.

##### **Search All Documents**

Allows you to search for the object in all open documents.

#### **Open Digital Tag Expert**

Opens the selected digital tag. This expert uses the OpenDigitalPoint subroutine.

##### **Data Source**

Allows you to enter the digital tag you want to open (for example, set to 0). Click the browse button (...) to view all of data sources available in your system. Click the down button to view the last data sources you used. Click the modify database block button to modify the selected data source. You can add a database block by entering a new database block tag name and tabbing off this field. The Quick Add dialog box appears and allows you to enter the appropriate values for the added block.

##### **Use Database Tags**

Allows you to open only the selected object's digital blocks. To make an object selectable, open the object's property page and set the property 'IsSelectable' to True.

**NOTE:** Before the action can be performed in the runtime environment, you must first click on the object to select it.

#### **Open Picture Expert**

Opens the specified picture. This expert uses the OpenPicture subroutine.

**Picture Name**

Allows you to specify the name of the picture you want to open. Click the browse button (...) to view all of the pictures available in your iFIX picture path.

**Picture Browse (...)**

Allows you to view all of the saved pictures in your iFIX picture path.

**Picture Alias**

Allows you to enter an optional alias for your picture instead of the name from the Picture Name field.

**Select Picture to Open in Run Mode**

Allows you to be able to choose the picture to open in the runtime environment. When this check box is enabled, the Picture Name field is disabled.

**NOTE:** This option is not available in the Scheduler.

**Allow Multiple Instances of this Picture**

Allows you to open a new instance of a picture, if the picture is already open in the WorkSpace when you run the OpenPicture subroutine.

**Top**

Allows you to specify the topmost position that you want to open the picture. The default is 0.

**Left**

Allows you to specify the leftmost position that you want to open the picture. The default is 0.

**Enable Tag Group Substitution**

Allows you to be able to use tag group substitution invoked on the picture being opened.

**Tag Group File**

Allows you to specify the file to be used for the tag group substitution.

**Select Tag Group file in Run Mode**

Using this option will prompt the user for the tag group file to be used for the substitution after the picture is opened. If both this and the select picture in run mode check box are selected, two prompts will appear. First the picture and second the Tag Group File.

**NOTE:** This option is not available in the Scheduler.

**Tag Group file Browse (...)**

Allows you to specify the name of the Tag Group file you want to use for Tag Group Substitution. Click the browse button (...) to view all of the Tag Group Files available in your iFIX picture path.

**Tag Group Editor Button**

This is the button directly to the right of the Tag Group Browse button (...). Allows you to launch the Tag Group Editor. If a Tag Group File is specified, this file will be opened when the Tag Group Editor is launched.

**Ramp a Value Expert**

Ramps the specified database tag by a percentage or actual value that you define. This expert uses the RampValue subroutine.

**Data Source**

Allows you to enter the data source whose value you want to ramp. Click the browse button (...) to view all of data sources available in your system. Click the down button to view the last data sources you used. Click the Modify Database Block button to modify the selected data source. You can add a database block by entering a new database block tag name and tabbing off this field. The Quick Add dialog box appears and allows you to enter the appropriate values for the added block.

**Ramp by Percentage**

Allows you to ramp the value by a percentage.

**Ramp by Value**

Allows you to ramp the value by a set value.

**Ramp Value**

The value to ramp the database tag value by.

**Use Database Tags**

Allows you to ramp only the selected object's database tag value. To make an object selectable, open the object's property page and set the property 'IsSelectable' to True.

**NOTE:** Before the action can be performed in the runtime environment, you must first click on the object to select it.

**Replace Picture Expert**

Replaces the specified picture with another picture that you select. If the picture you select is already open in the WorkSpace, another instance of that picture opens. This expert uses the ReplacePicture subroutine.

**Picture to Replace**

Allows you to specify the name of a currently open picture you want to replace. Click the browse button (...) to view all of the pictures available in your iFIX picture path.

**Picture Browse (...)**

Allows you to view all of the saved pictures in your iFIX picture path.

**Picture Alias**

Allows you to use the picture's alias name instead of its filename.

**Replace Current Picture in Run Mode**

Allows you to replace the current picture in the runtime environment. When this check box is enabled, the Picture to Replace field is disabled.

**NOTE:** This option is not available in the Scheduler.

**New Picture File Name**

The name of the new picture file to open. Click the browse button (...) to view all of the pictures available in your iFIX picture path.

**New Picture Browse (...)**

Allows you to view all of the saved pictures in your iFIX picture path.

**Enable Tag Group Substitution**

Allows you to be able to use tag group substitution invoked on the picture being opened.

**Tag Group File**

Allows you to specify the file to be used for the tag group substitution.

**Select Tag Group file in Run Mode**

Using this option will prompt the user for the tag group file to be used for the substitution after the picture is opened. If both this and the select picture in run mode check box are selected, two prompts will appear. First the picture and second the Tag Group File.

**NOTE:** This option is not available in the Scheduler.

**Tag Group file Browse (...)**

Allows you to specify the name of the Tag Group file you want to use for Tag Group Substitution. Click the browse button (...) to view all of the Tag Group Files available in your iFIX picture path.

**Tag Group Editor Button**

This is the button directly to the right of the Tag Group Browse button (...). Allows you to launch the Tag Group Editor. If a Tag Group File is specified, this file will be opened when the Tag Group Editor is launched.

**Set Tag to Auto Expert**

Sets the specified database tag to automatic. This expert uses the SetAuto subroutine.

**Data Source**

Allows you to enter the data source whose current mode you want to set to auto. Click the browse button (...) to view all of data sources available in your system. Click the down button to view the last data sources you used. Click the Modify Database Block button to modify the selected data source. You can add a database block by entering a new database block tag name and tabbing off this field. The Quick Add dialog box appears and allows you to enter the appropriate values for the added block.

**Use Database Tags**

Allows you to change the current mode to auto only on the selected object's database tags. To make an object selectable, open the object's property page and set the property 'IsSelectable' to True.

**NOTE:** Before the action can be performed in the runtime environment, you must first click on the object to select it.

**Set Tag to Manual Expert**

Sets the specified database tag to manual. This expert uses the SetManual subroutine.

#### **Data Source**

Allows you to enter the data source whose current mode you want to set to manual. Click the browse button (...) to view all of data sources available in your system. Click the down button to view the last data sources you used. Click the Modify Database Block button to modify the selected data source. You can add a database block by entering a new database block tag name and tabbing off this field. The Quick Add dialog box appears and allows you to enter the appropriate values for the added block.

#### **Use Database Tags**

Allows you to change the current mode to manual only on the selected object's database tags. To make an object selectable, open the object's property page and set the property 'IsSelectable' to True.

**NOTE:** Before the action can be performed in the runtime environment, you must first click on the object to select it.

#### **Shelve Expert**

Lets you configure an object that when clicked will shelve a single alarm in a picture run mode. To make an object selectable in configure mode, open the object's property page and set the IsSelectable property to True.

#### **FIX Database Tag**

Allows you to enter the data source whose current tag you want to set to automatically shelve. Click the browse button (...) to view all of data sources available in your system. Click the down button to view the last data sources you used. Click the Modify Database Block button to modify the selected data source.

#### **Use Database Tag(s) for Item(s) Selected In the Run Environment**

Allows you to use the tag properties of the selected object, such as datalink, in a picture to shelve alarms. When you select this option, no tag needs to be specified in the iFIX Database field. The ShelveAlarm command will shelve only 1 alarm, even if multiple objects with tags are selected or if a single object contains multiple tags that are in alarm and are enabled for shelving. A user may click the object additional times to shelve the additional tags. Note that the ShelveAlarm Expert does not work with the AlarmSummary object.

**NOTE:** Before the action can be performed in the runtime environment, you must first click on the object to select it.

#### **Shelve Duration**

Allows you to auto populate a shelve duration. Enter a time in minutes or hours. This time must be less than or equal to the alarm shelving policy defined for this tag.

#### **Toggle Digital Tag Expert**

Toggles the specified digital tag between open and closed. This expert uses the ToggleDigitalPoint subroutine.

#### **Data Source**

Allows you to enter the digital tag you want to toggle (for example, from 0 to 1 and vice versa). Click the browse button (...) to view all of data sources available in your system. Click the down button to view the last data sources you used. Click the Modify Database Block button to modify the selected data source.

You can add a database block by entering a new database block tag name and tabbing off this field. The Quick Add dialog box appears and allows you to enter the appropriate values for the added block.

#### **Use Database Tags**

Allows you to toggle only the selected object's digital blocks. To make an object selectable, open the object's property page and set the property 'IsSelectable' to True.

**NOTE:** Before the action can be performed in the runtime environment, you must first click on the object to select it.

#### **Toggle Scan Expert**

Toggles the specified database tag on and off scan. This expert uses the ToggleScan subroutine.

##### **Data Source**

Allows you to enter the data source whose scan you want toggle on and off and vice versa. Click the browse button (...) to view all of data sources available in your system. Click the down button to view the last data sources you used. Click the Modify Database Block button to modify the selected data source. You can add a database block by entering a new database block tag name and tabbing off this field. The Quick Add dialog box appears and allows you to enter the appropriate values for the added block.

#### **Use Database Tags**

Allows you to toggle the scan from on to off and vice versa only on the selected object's database tags. To make an object selectable, open the object's property page and set the property 'IsSelectable' to True.

**NOTE:** Before the action can be performed in the runtime environment, you must first click on the object to select it.

#### **Toggle Tag Between Auto and Manual Expert**

Toggles the specified database tag between auto and manual. This expert uses the ToggleManual subroutine.

##### **Data Source**

Allows you to enter the data source whose current mode you want to toggle from auto to manual and vice versa. Click the browse button (...) to view all of data sources available in your system. Click the down button to view the last data sources you used. Click the Modify Database Block button to modify the selected data source. You can add a database block by entering a new database block tag name and tabbing off this field. The Quick Add dialog box appears and allows you to enter the appropriate values for the added block.

#### **Use Database Tags**

Allows you to toggle the current mode from auto to manual and vice versa only on the selected object's database tags. To make an object selectable, open the object's property page and set the property 'IsSelectable' to True.

**NOTE:** Before the action can be performed in the runtime environment, you must first click on the object to select it.

#### **Turn Tag Off Scan Expert**

Turns the specified database tag off scan. This expert uses the OffScan subroutine.

#### **Data Source**

Allows you to enter the data source whose scan you want to turn off. Click the browse button (...) to view all of data sources available in your system. Click the down button to view the last data sources you used. Click the Modify Database Block button to modify the selected data source. You can add a database block by entering a new database block tag name and tabbing off this field. The Quick Add dialog box appears and allows you to enter the appropriate values for the added block.

#### **Use Database Tags**

Allows you to turn the scan off only the selected object's database tags. To make an object selectable, open the object's property page and set the property 'IsSelectable' to True.

**NOTE:** Before the action can be performed in the runtime environment, you must first click on the object to select it.

### **Turn Tag On Scan Expert**

Turns the specified database tag on scan. This expert uses the OnScan subroutine.

#### **Data Source**

Allows you to enter the data source whose scan you want to turn on. Click the browse button (...) to view all of data sources available in your system. Click the down button to view the last data sources you used. Click the Modify Database Block button to modify the selected data source. You can add a database block by entering a new database block tag name and tabbing off this field. The Quick Add dialog box appears and allows you to enter the appropriate values for the added block.

#### **Use Database Tags**

Allows you to turn the scan on only the selected object's database tags. To make an object selectable, open the object's property page and set the property 'IsSelectable' to True.

**NOTE:** Before the action can be performed in the runtime environment, you must first click on the object to select it.

### **Unshelve Expert**

Lets you configure an object that when clicked will unshelve a single alarm in a picture run mode. To make an object selectable in configure mode, open the object's property page and set the IsSelectable property to True.

#### **FIX Database Tag**

Allows you to enter the data source whose current tag you want to set to automatically unshelve. Click the browse button (...) to view all of data sources available in your system. Click the down button to view the last data sources you used. Click the Modify Database Block button to modify the selected data source.

#### **Use Database Tag(s) for Item(s) Selected In the Run Environment**

Allows you to use the tag properties of the selected object, such as datalink, in a picture to unshelve alarms. When you select this option, no tag needs to be specified in the iFIX Database field. The UnShelveAlarm command will unshelve only 1 alarm, even if multiple objects with tags are selected or if

a single object contains multiple tags that are in alarm and are enabled for shelving. A user may click the object additional times to unshelve the additional tags. Note that the UnShelveAlarm Expert does not work with the AlarmSummary object.

**NOTE:** Before the action can be performed in the runtime environment, you must first click on the object to select it.

### Write a Value Expert

Writes a value you select to the specified database tag. This expert uses the WriteValue subroutine.

#### Data Source

Allows you to enter the data source you want to write to. Click the browse button (...) to view all of the data sources available in your system. Click the down button to view the last data sources you used. Click the Modify Database Block button to modify the selected data source. You can add a database block by entering a new database block tag name and tabbing off this field. The Quick Add dialog box appears and allows you to enter the appropriate values for the added block.

#### Value

Allows you to specify the value to write to the current value of the database block. The default is 0.

#### Use Database Tags

Allows you to write only to the selected object's database tag's value. To make an object selectable, open the object's property page and set the property 'IsSelectable' to True.

**NOTE:** Before the action can be performed in the runtime environment, you must first click on the object to select it.

#### Alpha-Numeric

Enabled when your database tag allows alphanumeric data entry.

#### Numeric

Enabled when your database tag only allows numeric data entry.

### Data Entry Expert

Lets you select a data source and associate a data entry method for your object.

#### Data Source

Allows you to enter the data source that the new value will be written to. Click the browse button (...) to view all of data sources available in your system. Click the down button to view the last data sources you used. Click the modify database block button to modify the configuration of the selected data source. You can add a database block by entering a new tag name and tabbing off this field. The Quick Add dialog box appears and allows you to enter the appropriate values for the new block.

**NOTE:** If the tag requires electronic signatures, the data source will not update until the action is successfully signed for.

#### Choose Data Entry Method

Item	Description
------	-------------

Numeric/Alphanumeric Entry	<p>Allows the operator to set a tag's value by entering it directly at run time. You can configure the following options for the Numeric/Alphanumeric Entry Method:</p>
	<ul style="list-style-type: none"> <li>• <b>Numeric Entry Option</b> - Allows the operator to change a tag's value by entering it in a field in the picture. This allows the operator to enter numeric values only.</li> <li>• <b>Alphanumeric Entry Option</b> - Allows the operator to change a tag's value by entering it in a field in the picture. This allows the operator to enter both numeric and alphanumeric values.</li> <li>• <b>Low Limit</b> - Allows you to enter a value (up to seven decimal places long) that represents the lowest value the operator can enter. The valid range is dependent on the valid range of the data source. The default value is 0.</li> <li>• <b>High Limit</b> - Allows you to enter a value (up to seven decimal places long) that represents the highest value the operator can enter. The valid range is dependent on the valid range of the data source. The default value is 1 for digital blocks, and 100 for analog blocks.</li> <li>• <b>Fetch Limits Check Box</b> - Fetches the Low and High EGU limits from the data source automatically at runtime. This disables the high and low limit text boxes.</li> </ul>

#### Slider Entry

Allows the operator to change a tag's value by moving a slider control or entering an integer value at run time. You can configure the following options for the Slider Entry Method:

- **Low Limit** - Allows you to enter a value that represents the lowest value the operator can enter. The valid range is dependent on the valid range of the data source. The default value is 0.
- **High Limit** - Allows you to enter a value that represents the highest value the operator can enter. The valid range is dependent on the valid range of the data source. The default value is 1 for digital blocks, and 100 for analog blocks.

**NOTE:** The slider allows the operator to enter an integer value or to move the slider to an integer value. If you would like the operator to be able to enter a decimal value, use the Numeric/Alphanumeric entry method.

- **Fetch Limits Check Box** - Fetches the Low and High EGU limits from the data source automatically at runtime. This disables the high and low limit textboxes.
- **Write Continuously** - Allows the operator to change the value of the tag continuously in real time. As the operator moves the slider control, the value of the tag updates both in the slider control dialog box and at the data source.

**NOTE:** If the tag requires electronic signatures, the data source will not update until the action is successfully signed for, even if you select Write Continuously.

Pushbutton Entry	<p>Allows the operator to set a tag's value to 0 or 1. This is mainly used for Digital Output blocks. At run time, the operator is given two push-buttons. One button, when clicked, sets the value to 0, the other sets the value to 1.</p> <p>You can configure the following options for the Pushbutton Entry Method:</p> <ul style="list-style-type: none"><li>• <b>Open Button Title</b> - Allows you to enter a title (up to 12 characters long) for the pushbutton that sets the value to 0.</li><li>• <b>Close Button Title</b> - Allows you to enter a title (up to 12 characters long) for the pushbutton that sets the value to 1.</li></ul>
Ramp Entry	<p>Allows the operator to ramp a tag's value up or down by two different percentages at run time. You can configure the following options for the Ramp Entry Method:</p> <ul style="list-style-type: none"><li>• <b>Low Limit</b> - Allows you to enter a value (up to seven decimal places long) that represents the lowest value the operator can enter. The valid range is dependent on the valid range of the data source. The default value is 0.</li><li>• <b>High Limit</b> - Allows you to enter a value (up to seven decimal places long) that represents the highest value the operator can enter. The valid range is dependent on the valid range of the data source. The default value is 1 for digital blocks and 100 for analog blocks.</li><li>• <b>Fetch Limits Check Box</b> - Fetches the Low and High EGU limits from the data source automatically at runtime. This disables the high and low limit textboxes.</li><li>• <b>Ramp Percentage 1</b> - Allows you to enter a percentage that defines how much to ramp a value. The operator can ramp the tag's value up or down.</li><li>• <b>Ramp Percentage 2</b> - Allows you to enter a percentage that defines how much to ramp a value. The operator can ramp the tag's value up or down.</li></ul>

## Database Experts

The following list summarizes the Database Experts available in iFIX:

- [Add Database Block](#)
- [Database Reload](#)

- [Database Save](#)
- [Modify Database Block Expert](#)
- [Read a Value Expert](#)

#### Add Database Block Expert

Lets you add a new database block to your database without having to open Database Manager.

##### **Data Source**

Allows you to enter the tagname of the block you want to add to your database. Click the browse button (...) to view all of data sources available in your system. Click the down button to view the last data sources you used. Click the modify database block button to modify the selected data source. You can add a database block by entering a new database block tag name and tabbing off this field. The Quick Add dialog box appears and allows you to enter the appropriate values for the added block.

##### **Add**

Applies and saves any changes you have made and then closes this expert.

#### Database Reload

Lets you reload the current database without having to open Database Manager.

**NOTE:** The database in memory is replaced. No check is made to see if the database has been modified.

#### Database Save

Lets you save your database without having to open Database Manager.

#### Modify Database Block Expert

Lets you modify a new database block in your database without having to open Database Manager.

##### **Data Source**

Allows you to enter the tagname of the block that you want to modify in your database. Click the browse button (...) to view all of data sources available in your system. Click the down button to view the last data sources you used. Click the modify database block button to modify the selected data source. You can add a database block by entering a new database block tag name and tabbing off this field. The Quick Add dialog box appears and allows you to enter the appropriate values for the added block.

##### **Modify**

Applies and saves any changes you have made and then closes this expert.

#### Read a Value Expert

Retrieves the value from the specified database tag. This expert uses the ReadValue subroutine.

#### **Data Source**

Allows you to enter the data source you want to read the value from. Click the browse button (...) to view all of data sources available in your system. Click the down button to view the last data sources you used. Click the Modify Database Block button to modify the selected data source. You can add a database block by entering a new database block tag name and tabbing off this field. The Quick Add dialog box appears and allows you to enter the appropriate values for the added block.

#### **Use Database Tags**

Allows you to read only the selected object's database tag's value. To make an object selectable, open the object's property page and set the property 'IsSelectable' to True.

**NOTE:** Before the action can be performed in the runtime environment, you must first click on the object to select it.

### **Picture Experts**

The following list summarizes the Picture Experts available in iFIX:

- [Button Caption Converter Expert](#)
- [Export Key Macros Expert](#)
- [Generate Picture Expert](#)
- [Refresh Rate Expert](#)
- [Resolve Files Expert](#)
- [Save Files with Thumbnail Preferences Expert](#)
- [Upgrade File to Enhanced Coordinates Expert](#)

#### **Button Caption Converter Expert**

The Button Caption Converter allows you to select a button caption (text) in your active picture and convert that button caption text to scale to a new screen resolution. You can select one or more buttons to convert.

##### **Convert Button Caption**

Converts the selected button(s) in the 'Push buttons found on picture' dialog box..

##### **Find Next**

Allows you to confirm the conversion of each button individually.

##### **Convert all**

Converts all the selected button text.

##### **Close**

Closes the Button Caption Converter dialog box.

#### **Push buttons found on picture**

Lists all the buttons in the active picture that are available for conversion. It allows you to select a button from the list, which you can confirm. You can also confirm the button selection by looking at the button in the picture.

#### **Export Key Macros Expert**

Lets you export all of the key macros in the selected object, picture, or user global page to a .CSV file.

##### **Object**

The object, picture, or user global page from which you want to export key macros. You cannot edit this field from the expert.

##### **Recursive (Include Children)**

Lets you include key macros for all child objects. By default the Recursive (Include Children) check box is selected.

##### **File Name**

The name of the file to which you want to save your key macros. Click the browse button (...) to view all of the existing .CSV files. If you do not include a path, the .CSV file is saved to your iFIX directory.

##### **Browse (...)**

Allows you to view all of the .CSV files in your iFIX picture path.

##### **Append to File**

If you enter or browse to an existing file name, select the Append to File check box to add key macros to the end of an existing .CSV file.

##### **Export**

Click the Export button to export all of the key macros.

#### **Generate Picture Expert**

Generates a picture. This expert uses the GeneratePicture subroutine.

##### **Window Location**

Item	Description
Top	The preferred top window edge location of the picture being generated. The location Unit, pixel or percent, is determined by the Pixelscheck box.
Left	The preferred left window edge location of the picture being generated. The location Unit, pixel or percent, is determined by the Pixelscheck box.
Height	The preferred window height of the picture being generated. The dimension Unit, pixel or percent, is determined by the Pixelscheck box.

Width	The preferred window width of the picture being generated. The dimension Unit, pixel or percent, is determined by the Pixels check box.
Pixels	Determines whether the window location units are pixel or percent.

#### Window Styles

Item	Description
Titlebar	Defines whether or not the picture window has a title bar.
System Menu	Defines whether or not the picture window has a system menu.
Resizable	Defines whether or not the picture window is resizable using the mouse.
Always On Top	Defines whether or not the picture window is always on top of other picture windows.
Runtime Visible	Defines whether or not the picture is visible at runtime.

#### Background Color

Color button for defining the background color of the picture.

#### Picture Name

The name of the picture.

#### Refresh Rate Expert

Lets you change the refresh rate for a selected object or an entire picture. By default, the refresh rate is set to 1.

You can modify the refresh rate to fast or slow values. For example, you might want to give faster refresh rates to objects where you enter data sources.

#### Selected Objects

Select this option button to apply changes to the refresh rate for the selected object.

#### Entire Picture

Select this option button to apply changes to the refresh rate for the entire picture.

#### Tolerance

Specifies the current connection's rounding factor. Typically, iFIX uses this value when comparing a process value to a target value. If the process value is within the specified tolerance, iFIX assumes the two values are equal. For example, if the target value is 1.0, the tolerance is 0.1, and the current value of a

data source is 0.8, iFIX does not assume the two values are equal because the data source is not within the specified tolerance. The value must be within the range 0.9 to 1.1 to equal the target value.

#### **Deadband**

Specifies the maximum fluctuation you want for the current connection before iFIX updates it. By entering a dead band value, you create a +/- dead zone around the connection's current value. As long as the value is within this range, iFIX does not update the value. However, once the value exceeds the maximum or minimum dead band, the value is updated.

#### **Refresh Rate**

Specifies the rate at which iFIX updates the current connection. iFIX updates the connection no faster than the specified speed.

### **Resolve Files Expert**

Lets you resolve files before you enter into the Runtime environment. If you do not resolve your files before switching to the Runtime environment, the Workspace queries the database and resolves all the tag definitions. This can be a time consuming process that slows down opening a picture. By using the Resolve Expert to resolve your files, you can improve the speed of opening pictures.

#### **File Types**

Item	Description
Pictures	Allows you to specify that you want to resolve pictures. Displayed in the list box below will be the names of all the pictures saved in your iFIX picture path.
Schedules	Allows you to specify that you want to resolve schedules. Displayed in the list box below will be the names of all the schedules saved in your iFIX schedule path.

#### **Directories**

Item	Description
Picture Directory	Specifies the directory where the pictures that you want to resolve are located.
Update Picture Files Button	Refreshes the picture names in the file list if you change the path in the Picture Directory field.
Schedule Directory	Specifies the directory where the schedules that you want to resolve are located.
Update Schedule Files Button	Refreshes the schedule names in the file list if you change the path in the Schedule Directory field.

#### **Resolve Files**

Allows you to select the files you want to resolve. Hold down the <CTRL> button to select multiple files, or click the Select All button to select all of the files. The file names displayed are all of the files saved in your iFIX picture and/or schedule directories.

#### **Select All**

Selects all of the files in the list box.

#### **Deselect All**

Deselects all of the files in the list box.

#### **Save Files with Thumbnail Preferences Expert**

Allows you to save thumbnail images of existing pictures. If you chose not to save existing pictures (files) with thumbnails, you cannot view the images from the system tree.

#### **File Types**

Item	Description
Pictures	Populates the Save Files With list box with a list of all of the pictures (*.grf files) saved in your iFIX picture path.
Dynamo Sets	Populates the Save Files With list box with a list of all of the dynamo sets (*.fds files) saved in your iFIX picture path.

#### **Directories**

Item	Description
Pictures Directory	Specifies the directory where the pictures that you want to save with a thumbnail are located.
Refresh Picture List	Refreshes the picture names in the file list if you change the path in the Pictures Directories field.
Dynamo Sets Directory	Specifies the directory where the Dynamo sets that you want to save with a thumbnail are located.
Refresh Dynamo Set List	Refreshes the names of the Dynamo in the file list if you change the path in the Dynamo Sets Directories field.

#### **Save Thumbnails**

Allows you to save thumbnails with your files.

**NOTE:** This setting overrides the Save thumbnail setting on the [Picture Preferences tab in the User Preferences dialog box](#).

#### **Save Files With**

Allows you to select the files you want to save with a thumbnail. Hold down the <CTRL> button to select multiple files, or click the Select All Button to select all of the files. The file names displayed are all of the files saved in your iFIX picture and/or Dynamo sets directories.

#### **Select All**

Selects all of the files in the list box.

**Deselect All**

Deselects all of the files in the list box.

**Upgrade File to Enhanced Coordinates Expert**

The Upgrade File to Enhanced Coordinates Expert upgrades a Logical Coordinate System picture or dynamo set to the Enhanced Coordinate System.

**File Type**

Allows you to select the file type to display in the Select Files window. You can select Pictures or Dynamo Sets or both.

**Picture and Dynamo Set Folder Path**

Lists the path to the folder that contains the pictures and/or Dynamo Sets on which you wish to upgrade to the Enhanced Coordinate System, or restore to the Logical Coordinate System.

**Browse (....)**

Allows you to select a different folder that contains the files you want to upgrade or restore.

**Refresh File List**

Updates the files in the Select Files window to reflect eligible files in the folder you selected.

**Upgrade Files**

Upgrades the selected files to screen independent Enhanced Coordinates. By default, this button is enabled when the dialogue box opens.

**Restore Files from Backup**

Restores files from the Backup folder. When you select this option, files that are eligible for restoration are listed in the Select Files window.

**Select Files**

Lists files that are eligible for upgrading or restoration. Files eligible for upgrading include files that are not using the Enhanced Coordinate System and that are not open in the iFIX WorkSpace. By default, the picture files in your default directory display. Files that are eligible for restoration are those files that have been upgraded and for which a backup file exists in the Backup folder.

**Buttons**

Button	Description
Select All	Selects all the files listed in the Select Files window.
Deselect All	Clears all the files selected in the Select Files window.
Upgrade Files	Upgrades screen dependent Logical Coordinate System pictures and/or Dynamo Sets to screen independent Enhanced Coordinate System pictures and/or Dynamo Sets.
Restore Files	Restores the upgraded picture and/or Dynamo Set to the previously saved file in the Backup folder when the file exists. All changes made to the file since the upgrade will be lost. After the restoration operation is completed, the restored files are removed from the list in the Select Files window and are returned to the list of files eligible for upgrading.

## **Reports Experts**

The following list summarizes the Reports Experts available in iFIX:

- [Cross Reference Tool](#)
- [Print Crystal Report Expert](#)
- [Print Crystal Report \(PrintReport Subroutine\)](#)

### **Cross Reference Tool**

For more information, refer to "The Cross Reference Tool" chapter of the Mastering iFIX ebook.

### **Print Crystal Report Expert**

Lets you select a Crystal Report, preview it, and print it.

#### **Select Report**

Allows you to open a Crystal Report for printing. You can only select reports that were created with Crystal Reports.

#### **Preview Report**

Allows you to display a preview of the report. From the Preview window, you can print the report.

#### **Report Name**

Displays the full path of the selected report.

### **Print Crystal Report Expert (PrintReport Subroutine)**

Prints the Crystal Report you specify. This expert uses the PrintReport subroutine.

#### **Select Report**

Allows you to search the iFIX picture path for the report you want to print.

#### **Report Name**

Displays the name of the selected report.

#### **Print All**

Allows you to print the entire selected report.

#### **Print Selected Pages**

Allows you to print only the pages of the selected report that you specify. This option is ignored in Crystal XI.

#### **From Page**

Specifies the first page in a range of pages that you want to print only when you select Print Selected Pages. This option is ignored in Crystal XI.

#### **To Page**

Specifies the last page in a range of pages that you want to print only when you select Print Selected Pages. This option is ignored in Crystal XI.

#### **Prompt User**

Allows you to specify if you want to be prompted when the report is finished printing. This option is ignored in Crystal XI.

#### **Collate**

Prints the report in the proper binding order. This option is ignored in Crystal XI.

#### **Number of Copies**

The number of copies that you want printed. This option is ignored in Crystal XI.

### **Create Objects**

The following Create Objects are available from the toolbox in the iFIX WorkSpace:

- [Variable Object](#)
- [Timer Object](#)
- [Event Object](#)

#### **Variable Object**

You can insert a variable object in an iFIX picture. The variable object can belong to the current picture or you can set it as a global object that is available to your entire system.

##### **Variable Name**

Allows you to specify the name of the new variable object. The variable name must consist of alpha-numeric values and must begin with a letter.

##### **Variable Type**

Allows you to specify the variable object's type. Click the down button to view the list of types.

##### **Assign Variable**

Allows you to connect the variable object's current value to a database block.

##### **Data Source**

Only enabled when the Assign Variable check box is checked, this allows you to enter the data source to connect the variable to. Click the browse button (...) to view all of data sources available in your system. Click the down button to view the last data sources you used. Click the modify database block button to modify the selected data source. You can add a database block by entering a new database block

tag name and tabbing off this field. The Quick Add dialog box appears and allows you to enter the appropriate values for the added block.

#### **Local Variable**

Allows you to define the variable as a local variable.

#### **Global Variable**

Allows you to define the variable as a global variable.

### **Timer Object**

You can insert a timer object in an iFIX picture. The timer object performs an operation based on an interval of time. You must enter VB code into the timer object's event for anything to actually occur. If you select the Edit Script button, VBE automatically launches and the cursor is positioned to the timer's OnTimeOut event. You can then enter code for the new timer object. If you select OK, the timer object is created but you will have to go in at a later date and enter the VB code for the timer.

The timer object event that is invoked is the OnTimeOut event. The timer has four different types of triggers for the OnTimeOut event:

- 0 - One Shot
- 1 - Continuous
- 2 - Daily
- 3 - Monthly

The default trigger type is Continuous. If you want to use a different trigger type, you will have to set the timer's TriggerType property to the correct number. For Example:

```
MyTimer.TriggerType = 0
```

Sets the timer trigger type to One-Shot.

#### **Timer Name**

Allows you to specify the name of the timer object.

#### **Timer Description**

Allows you to specify an optional description of the timer.

#### **Start Time**

Allows you to specify the start time for the Timer. The format must be in the following format:

```
hours: minutes: seconds
```

#### **Interval**

Allows you to specify the time interval in milliseconds.

#### **Edit Script**

Applies and saves changes you have made, launches VBE to the timer object's OnTimeOut event, and closes the expert.

### **Event Object**

You can insert an event object in an iFIX picture. The event object performs an operation when its event type is triggered. You must enter VB code into the object's event for anything to actually to occur. If you select the Edit Script button, VBE automatically launches and the cursor appears at the event type that you select for the event object. You can then enter code for that event. If you select OK, the event object is created but you will have to go in at a later date and enter the VB code for the event.

#### Event Source

Allows you to enter the data source to connect the event object to. Click the browse button (...) to view all of data sources available in your system. Click the down button to view the last data sources you used. Click the modify database block button to modify the selected data source. You can add a database block by entering a new database block tag name and tabbing off this field. The Quick Add dialog box appears and allows you to enter the appropriate values for the added block.

#### Event Properties Tab

The Event Properties tab contains the following items:

Item	Description
Name	Allows you to specify the name of the event object.
Description	Allows you to specify an optional description of the event.
Event Type	Allows you to specify the type for the event object. The valid entry types are: <ul style="list-style-type: none"><li>• On Data Change - when the value of data source for the object changes.</li><li>• On True - when the value of the data source for the object changes to True.</li><li>• On False - when the value of the data source for the object changes to False.</li><li>• While True - while the value of the data source for the object is True.</li><li>• While False - while the value of the data source for the object is False.</li></ul>
Interval	Specifies the time interval in milliseconds. Only enabled when the Event Type is While True or While False.

#### Historical Properties Tab

The Historical Properties tab allows you to set the parameters for a query that fetches historical data from GE Historian. The tab contains the following items:

**NOTE:** The following fields, with the exception of the Update Rate fields, are only available if you select a Historical Mode other than Current Value.

#### Start Date

Item	Description
Fixed Date	Specifies whether to enter a specific start date for the query of the data source.

<b>Days Before Now</b>	Specifies whether to enter the number of days prior to today to fetch data from GE Historian. For example, if you want to display data collected for the data source two days ago, enter 2.
------------------------	---

## Start Time

Item	Description
Fixed Time	Specifies whether to designate a specific time to start. If selected, allows you to enter an explicit start time.
Lock Time	Locks the Fixed Time, even if you change the time zone in the Date and Time Properties dialog box in the Control Panel. This field is available only when you designate a specific time to start using the Fixed Time field.
Duration Before Now	Specifies whether to enter the duration prior to the current time to start. The minimum duration is 0 seconds; the maximum is 23 hours, 59 minutes, and 59 seconds.

## Time Zone

Item	Description
Time Zone	Allows you to select the time zone to associate with the start time. You can select the client time (time zone for your computer), the server time (time zone used by the Historian server), or the tag time (uses the time zone bias of the tag, which is set in Historian). The default time zone is that of the client machine. This field is available only when Historian is used.
Adjust for Daylight Savings Time	Adjusts the time if the zone you selected is experiencing daylight saving. This field works only if you selected the Automatically adjust clock for daylight saving changes check box located on the Time Zone tab of the Date/Time Properties dialog box in the Control Panel.

## Historical Mode

Allows you to determine how iFIX selects and fetches data from a historical data source and, determines what each displayed value represents. The options are:

- Sample - The last valid value found, up to and including the start of the specified interval.
- Avg - The average of all valid data found during the specified interval.
- High - The highest valid data point value found during the specified interval.
- Low - The lowest valid data point value found during the specified interval.
- Interpolated - The data is interpreted by assuming that the line between two values is a straight line. All points along that line are estimated except the starting point and the ending point.
- Current Value - The current value of the data point.

**IMPORTANT:** The Current Value may update at a rate different from the rate set in the Update Rate field. The update rate is not set solely by the rate entered in the Update Rate field. It also depends on

the collection rate, the rate for querying Historian, and the time required to request an update from the Historian server and send it back to the client. As a result, the time it takes to display the updates may be longer than anticipated. Additionally, please be aware that the timestamp for this mode represents the timestamp from the Historian server, not the client.

- Std Deviation - The standard deviation of all valid data found during the specified interval.
- Total - The total of all valid data found during the specified interval.

## Duration

The duration determines the time range for the historical data source. The minimum duration for a fetch is one second; the maximum is 999 days, 23 hours, 59 minutes, and 59 seconds.

Item	Description
Days	Allows you to enter the number of days. This field can be used in conjunction with the other fields in this area.
Hours	Allows you to enter the number of hours for the duration for the data fetch query. This field can be used in conjunction with the other fields in this area.
Mins	Allows you to enter the number of minutes for the duration for the data fetch query. This field can be used in conjunction with the other fields in this area.
Secs	Allows you to enter the number of seconds for the duration for the data fetch query. This field can be used in conjunction with the other fields in this area.

## Update Rate

Allows you to specify the rate at which the data is updated. The default rate is five seconds. Zero is permitted for a one-time fetch. The fastest update rate is five seconds, the slowest, 1:59:59.

Item	Description
Hours	Allows you to enter the number of hours for the rate of data update. This field can be used in conjunction with the other fields in this area.
Mins	Allows you to enter the number of minutes for the rate of data update. This field can be used in conjunction with the other fields in this area.
Secs	Allows you to enter the number of seconds for the rate of data update. This field can be used in conjunction with the other fields in this area.

## Edit Script

Applies and saves changes you have made, launches VBE to the event type you selected for the event object, and closes the expert.

## Using Dynamos

As you develop a system of operator displays, you may want to use an object you created for one picture in several other pictures. iFIX offers a convenient way to save custom-built objects and application scripts into a higher-level reusable object set, called *Dynamo objects*. Dynamo objects allow you to customize your pictures by creating a consistent design across your operator displays.

iFIX provides a wide selection of pre-built Dynamos that use the most common shapes and objects in the process automation industry today. You can also build and save your own Dynamos in the WorkSpace using the Build Dynamo Wizard, and then dragging the new Dynamo into a set for use in other pictures. Using existing Dynamo Sets can expedite your picture development, thereby increasing the performance of your entire operation.

For more information on Dynamo objects, refer to [Working with Dynamo Objects](#) chapter.

## Using Global Subroutines

Global subroutines are tools in VBA that allow you to modify a script to perform a global task, such as opening a picture. All of iFIX's Experts use global subroutines, which reside in the FactoryGlobals.fwg file. For more information on global subroutines, and how to use them to modify scripting functions, refer to the [Writing Scripts](#) manual.

## Performing Functions with Toolbars

Toolbars let you quickly perform tasks in your picture by merely clicking a button. There are many types of toolbars in iFIX to help you expedite your picture development. For more information on toolbars, refer to the [Getting Started](#) and [Developing Objects in Pictures](#) sections.

# Controlling Object Properties

Properties are perhaps the most significant feature of objects. They define how your objects perform, and therefore dictate how well your pictures accomplish your process goals. They allow the user to define and control such object attributes as size, shape, edge and background fill, rotation angle, and scaling. This chapter describes how you work with these properties to maximize the effect of your pictures.

- [How Properties Work](#)
- [Defining and Modifying Properties](#)

## How Properties Work

When you create pictures, you can add a variety of objects, such as charts, text, and bitmaps, or geometric shapes, such as rectangles, polygons, and ovals. Each object contains properties - specific attributes assigned to the object that make it unique.

Properties make objects either visible or invisible. *Visible* objects are those that contain properties you can see, such as a color or style fill. These are attributes that you can control in several ways. *Invisible* objects, also called *animation objects*, are those that are added to objects during animation, such as rotation, and scaling. When you animate an object, invisible objects are added to your pictures automatically, without your control, and displayed in the system tree. Both visible and invisible properties can be modified using either the Properties window or the Animations dialog box.

**NOTE:** Read-only properties cannot be modified directly. For example, to change the bottom edge of a rectangle (a read-only property), you would have to change the rectangle's height property to affect the edge property.

## Defining and Modifying Properties

You can modify properties by:

- [Entering property values manually](#)
- [Animating the object](#)
- [Writing a script to change the property's value](#)

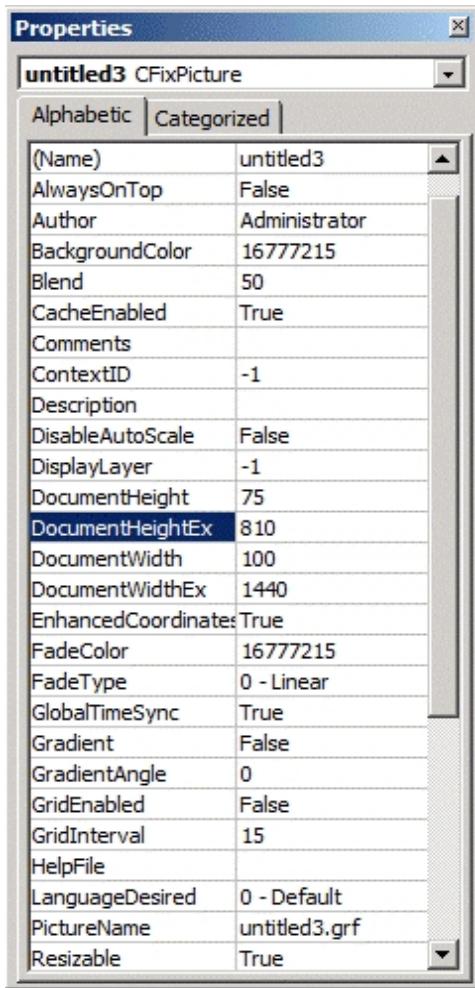
These methods are discussed in the following sections.

### Entering Property Values Manually

Property values give you precise control over an object's properties, and lets you set a property to an exact limit.

## Entering Property Values with the Properties Window

One way you can manually enter a property value for a visible or invisible object or animation is with the Properties window, shown in the following figure. This window displays the object properties you can modify (read-only properties do not appear). Because the window is modeless, it stays on your screen as you change property values or select other objects to modify. This allows you to view properties as you make other changes to your picture.



To use the Properties window, enter property values in the window's right-hand column and press Enter. Some properties let you select a value from a list instead of entering it. In these cases, when you select the cell, a drop-down list box appears. To hide the Properties Window, right-click a cell in the window and select Hide from the pop-up menu.

## Entering Property Values with the Advanced Animations Dialog Box

You can also change property values with the Advanced Animations dialog box. When you access the Advanced Animations dialog box, the selected object's properties are displayed. Only the properties that accept data appear in the dialog box; read-only properties do not appear. To display read-only properties, use the Visual Basic Editor. For more information on using the Visual Basic Editor, refer to the [Writing Scripts](#) manual.

The Advanced Animations dialog box groups similar properties together into categories. Each category is represented by a tab in the dialog box. Certain tabs appear only if the selected object has the associated properties. For example, the Text tab appears only for text objects; only text objects have font and font style properties.

Each tab displays the following information:

- The property name.
- The property value.
- Whether the property is being used in an animation.

The following table describes each Animation dialog box tab.

**Animation Dialog Box Tabs**

The tab...	Allows you to configure...
General	The object's name, description, and behavior at run-time, as well as a help context ID.
Visible	Whether the object is visible.
Size	The height, the width, the percentage to resize the object by, the direction to resize the object in, and whether the object is uniformly resized.
Misc	The object's layer in a picture, as well as numerous properties specific to certain object types..
Position	The vertical and horizontal position of the object.
Color	The foreground color, background color, and edge color of the object, as well as edge and grid properties specific to a chart object.
Style	The fill style, the edge style, and the line width, as well as properties specific to rounded rectangle, pipe, and chart objects. Not all objects have a fill style. Refer to the <a href="#">Coloring and Styling Objects</a> section for more information.
Rotate	The angle of rotation of an object and the unit of measure for the angles. Ovals, rounded rectangles, and charts do not have rotation properties.
Text	The font size, the font style, the font name, and the text displayed by the object. Text properties apply only to text objects.
Behavior	The behavior of the object's sizing, scaling, alignment, and text properties. There are also properties specific to chart objects.
Gradient	The fade color, fade type, gradient angle and blend percentage to use for the gradient fill. Pipe objects do not have fade type and gradient angle properties.
Fill	The direction to fill the object, and the percentage to fill the object.
Appearance	The background and foreground colors , and the background style and caption of a button object.
Picture	The position of the picture.
Variable	The variable type, and the initial and current values of a variable object.

For a complete list of properties that you can animate, and the objects the properties apply to, refer to [Object Properties](#).

**NOTE:** When entering R, G, B values in the Advanced Animations dialog box, the values must be enclosed in parentheses.

For more detail on the Animations dialog box, refer to the [Animating Object Properties](#) chapter.

## Animating Objects to Modify Properties

Visible objects can be animated, providing an advanced level of control and customization to your pictures. Although what you see in the iFIX WorkSpace is an object performing an action, it is the object's properties that are animated, not the object itself. You animate object properties using the Animations dialog box. This dialog box, available for every object in iFIX, takes client data, finds its source, and then delivers output based on that source.

For more detailed information on animating objects, refer to the [Animating Object Properties](#) chapter.

## Writing Scripts to Modify Properties

Visual Basic scripts provide developers with maximum flexibility and control of their objects. Although it is not required that you know VBA to work with properties, it is a powerful technology for those who want to use it. Every function on the Animations dialog box is also available through VBA.

For more information on using scripts to customize objects, refer to the [Writing Scripts](#) manual. For information on iFIX methods, properties, and events, refer to the iFIX Automation Interfaces Help file.

# Animating Object Properties

Whether you have developed one or one hundred pictures using iFIX, you probably have discovered that creating these pictures can involve much more than just drawing a static oval and linking it to a process database. Thanks in great part to the power of animation, you can make your pictures perform in ways that you have never seen before. iFIX gives you the ability to acquire and interpret data so that your pictures perform as you expect them to.

This chapter describes animations, and how they give you the power to design custom pictures and dynamic displays.

- [How Animations Work](#)
- [Animating an Object's Properties: Overview](#)
- [Defining Data Sources](#)
- [Animating Properties Using Color](#)
- [Animating Object Properties with Visual Basic](#)
- [Animating a Grouped Object](#)
- [Modifying Animations](#)
- [Deleting Animations](#)
- [Building Expressions](#)

## How Animations Work

Animations are objects. When you animate the property of an object, animation objects are added to the object that contains that property. Although the result you see in the iFIX WorkSpace is an object performing a visible, functional action, it is the object's properties that are animated, not the object itself.

- [Understanding Data Sources](#)
- [Accessing the Animations Dialog Box and Using Common Animations](#)
- [Understanding Animation Objects](#)
- [Animating an Object's Properties](#)
- [Using Experts to Animate Objects](#)

## Understanding Data Sources

When you animate an object, the values of one or more of its properties change. Inherent to each property is the location where it received data. This location is called a *data source*. Typically, a data source identifies a process value or another object's property. However, a data source can be any of the following:

- Real-time data from an I/O address.
- An iFIX tag.
- The value of a picture or object property.
- A global variable.
- A predefined expression.
- A VBA event.
- OPC servers.
- GE Historian.

In order to animate an object, you must connect to one of these data sources. In some cases, you can make a direct connection to a data source. In other instances, such as with Animation Experts, you connect an object to an animation object, and then connect the animation object to the data source.

**NOTE:** Because animations change object properties, you can only use a property in an animation if the property accepts data. Read-only properties cannot be used. You can display the available properties by opening the Animations dialog box or the Properties window.

To specify a data source, you enter the appropriate syntax in the Data Source field of the Animations dialog box. Then, by specifying a conversion method for the data, you tell iFIX how you want to process the data so that you can achieve the desired effect. For more information on selecting data sources, and specifying syntax and conversion types, refer to the [Defining Data Sources](#) section.

## Accessing the Animations Dialog Box and Using Common Animations

When you are ready to animate an object, select a way to animate it from the following table:

From the...	Do this...
-------------	------------

Expert	Select the appropriate Expert from the Experts toolbar, the Task Wizard, or the Toolbox (Classic and Ribbon views), or from the Tools tab, in the Animations Group, or by clicking the Animations Dialog Box Launcher (Ribbon view).
Basic Animation dialog box	<p>Double-click an object or select Animations from the right-click menu.</p> <p>For some objects, such as OCXs, Alarm Summaries, Data links, and charts, you must right-click the object and select Animations from the pop-up menu.</p> <p>For more information refer to the <a href="#">Using the Animations Dialog Box</a> section.</p>
Advanced Animations dialog box	<p>Click the Configure button on the Basic Animations dialog or, if configured, the Advanced Animations dialog appears when you double-click the object.</p> <p>For some objects, such as OCXs, Alarm Summaries, Data links, and charts, you must right-click the object and select Animations from the pop-up menu.</p> <p>Click the tab that contains the property you want to use. You can find a description of the dialog box tabs in the <a href="#">Entering Property Values Manually</a> section. The Animations dialog box is available for every object (and every property of that object) in iFIX. For a description of what each property does, refer to the Property Description in the Properties area.</p>

The following table summarizes some of the more commonly-used animations.

**Commonly-Used Properties for Animations**

Animating the property...	On the tab...	Lets you...
HorizontalPosition	Position	Move an object horizontally across the screen.
VerticalPosition	Position	Move an object vertically across the screen.
HorizontalFillPercentage	Fill	Horizontally fill an object based on a percentage. For example, if the value of the property is 50, the object is filled 50%.
VerticalFillPercentage	Fill	Vertically fill an object based on a percentage. For example, if the value of the property is 50, the object is filled 50%.
HorizontalFillDirection	Fill	Horizontally fill an object from the left, right, or center.
VerticalFillDirection	Fill	Vertically fill an object from the top, bottom, or center.
RotationAngle	Rotate	Define the amount to rotate an object. Ovals, rounded rectangles, and charts do not have rotation properties.
UniformScale	Size	Proportionally scale an object.
Height	Size	Scale the height of an object. The width remains unchanged.
Width	Size	Scale the width of an object. The height remains unchanged.
HorizontalScalePercentage	Size	Horizontally scale an object based on a percentage. For example, if the value of the property is 50, the object is scaled 50%.
VerticalScalePercentage	Size	Vertically scale an object based on a percentage. For example, if the value of the property is 50, the object is scaled 50%.
ForegroundColor	Color	Change the foreground color of an object. Lines, polylines, and bitmaps do not have foreground color properties.
Visibility	Visible	Make an object visible or invisible.

Caption (text objects only)	Text	Change the text displayed by a text object.
Fade Color	Gradient	Change the fade color of an object.
Fade Type	Gradient	Change the fade type of an object.

### Animating a Size Property

You can fill an object based on an analog input value or rotate an object based on a SIM or SM2 register value. You can also dynamically scale objects by animating the height and/or width of an object. When scaling objects in this manner, be careful of the data source you select. For example, if you animate a rectangle's height based on a variable's current value (data source is User.Variable1.CurrentValue), the object is resized in the configuration environment to match the variable's value. Since the WorkSpace is in the configuration environment, the value is set to zero and the rectangle is resized to look like a horizontal line. When you switch to the run-time environment, the variable receives new values based on the variable's configuration and the size of the rectangle changes. When you switch back to the configuration environment, the rectangle appears as a line again because the variable's value is reset to zero.

The same effect results using the Scale Expert and you select the current value of a variable as the data source.

## Understanding Animation Objects

Animation objects come in three forms:

- **Linear** - Accepts any input data from a process database, and returns a corresponding output value (Example: Animating the foreground color of an oval). Refer to the [Understanding Signal Conditioning](#) section of the Building a SCADA System manual for more detail on how the Linear object works.
- **Lookup** - Accepts any input data from a process database and presents that value to each entry in a lookup table to determine whether that value is in a range. If that value matches the range, the Lookup object then returns the corresponding output value. If the value does not match the range, it moves to the next row in the table and returns that output value (Example: Blinking the color of a rectangle based on a toggle rate).
- **Format** - Accepts any input data from a database and returns a string as an output value (Example: Creating a caption for a text object).

The most common animation object is the *Lookup object*, which is used primarily to apply color. This application is further described in the [Animating Properties Using Color](#) section. For more information on animation object properties, refer to the iFIX Automation Interfaces Help file.

Most of your connections to data sources are through animation objects. However, you do *not* need an animation object to animate an object. For example, if another object contains a property that provides the desired animation, you can connect to that property. This is because every object has the ability to perform permanent connections from one of its properties to another. Essentially, the animation object only transforms data from the property of one object to the property of another object.

## Animating an Object's Properties

The steps that follow provide an overview of how to animate an object's properties.

► To animate the properties of any object in a picture:

1. Select an object.
2. In Classic view, click the appropriate Expert on the Experts toolbar, the Task Wizard, or the Basic Animation dialog box.  
-Or-
- In Ribbon view, on the Tools tab, in the Animations group, click Animations and choose the appropriate Expert.
3. In the Data Source field, enter the data source you want to use to dynamically set property values.
4. If appropriate, select the type of data conversion you want to use and complete the related fields.
5. If appropriate, on the Historical Properties tab, select the start date and time, the time zone, the historical mode, duration, and update rate.

For a list of commonly-used properties, refer to the [Commonly-Used Properties for Animations](#) table in the [Understanding Data Sources](#) section.

## Using Experts to Animate Objects

An easy way to animate objects is to use Experts. To access an Expert, click the button on the Experts toolbar that corresponds to the task you want to perform (Classic view), or on the Tool tab, in the Animations group, click Animations, and then choose the appropriate Expert (Ribbon view). Some Experts are only available using the Task Wizard. For example, if you want to animate the edge color of an oval, select the Edge Color Expert from the Animation category of the Task Wizard.

To learn more about the fields on the Expert, click the Help button on the Expert. For more information on iFIX Experts and the Task Wizard, refer to the [Using Process Assistants to Expedite Pictures](#) chapter.

Additionally, you can access some Experts from the Basic Animation dialog box. To open the Basic Animation dialog box, select Animations from the object's right-click menu.

## Defining Data Sources

Both the Basic and Advanced Animations dialog boxes group similar properties together into categories. In the Basic Animation dialog box, the Animation Experts are grouped by Color, Movement, Fill, Visibility, and Command. There is also an Additional section that allows you to configure all animations using the Advanced Animations dialog box.

In the Advanced Animations dialog box, each category is represented by a tab. You can select one or more properties from these tabs as needed. For example, suppose you want to horizontally fill a tank and change the foreground color simultaneously. To do this, you would select the HorizontalFillPercentage property on the Fill tab and the ForegroundColor property on the Color tab.

Regardless of whether you select one property or seventeen, you must connect to a data source for each property so that the necessary data can be retrieved and processed. The data source for one property can be completely different than that of another property. For more information about data sources, refer to the following topics:

- [Entering Data Source Syntax](#)
- [Selecting Data Sources from a List](#)
- [Filtering Data Sources](#)
- [Specifying Data Conversions](#)
- [Classifying Animations Errors](#)

## Entering Data Source Syntax

To select a data source, enter its name in the Data Source field of the Animations dialog box, using the required syntax that tells iFIX what type of source contains the data. To assist you with the data source and its syntax, iFIX provides *intelligent defaults*, which allows the software to automatically fetch a data source based on an incomplete entry. For example, if your data source is an iFIX tag, and you enter AI1 in the Data Source field, iFIX connects to a .F\_CV field in the FIX32 database on the local SCADA server.

The following table lists the syntax for each data source type.

**Data Source Syntax**

When the data source is...	Use the syntax...
An iFIX tag	<p>Fix32.node.tag.field</p> <p>where:</p> <p><i>node</i> is the name of the iFIX SCADA server you are connecting to;</p> <p><i>tag</i> is the database tag; and</p> <p><i>field</i> is the database field.</p>
A GE Historian tag	<p>Hist.collector.tag</p> <p>where:</p> <p><i>Hist</i> is the alias of the GE Historian Server;</p> <p><i>collector</i> is the name of the GE Historian collector you are connecting to; and</p> <p><i>tag</i> is the database tag.</p>
An I/O address	<p>server.io_address</p> <p>where:</p> <p><i>server</i> is the name of the OPC server; and</p> <p><i>io_address</i> is the I/O address of that server.</p>
An object property in a picture	<p>picture.object.property</p> <p>where:</p> <p><i>picture</i> is the picture that contains the object;</p> <p><i>object</i> is the object in the picture; and</p>

	<i>property</i> is the object's property name.
A picture property	<p><code>picture.property</code></p> <p>where:</p> <p><i>picture</i> is the picture that contains the property; and</p> <p><i>property</i> is the picture's property name.</p>
A VBA event	N/A. When you animate objects with a VBA script, the script handles all of the animation by directly changing the appropriate properties.
A global variable	<p><code>xxx.variable</code></p> <p>where:</p> <p><i>xxx</i> is the global object; and</p> <p><i>variable</i> is the name of the variable within the global object.</p>
An expression	<p><code>value operator value</code></p> <p>where:</p> <p><i>value</i> is the primary value;</p> <p><i>operator</i> is an operator relating to both values; and</p> <p><i>value</i> is the secondary value.</p> <p>For more information on creating expressions, refer to the <a href="#">Building Expressions</a> section.</p>

Some third-party OPC servers require characters in their syntax that are not parseable by the Expression Editor. If the OPC server syntax uses any characters that do not appear in the list of valid characters below, the server syntax must be enclosed within single quotes ('') as follows:

```
ServerName.'Device:MyAddress'
```

In this example, *ServerName* is the name used to identify the third-party OPC server, and single quotes surround *Device:MyAddress*, the part of the syntax that contains the unparsable character(s). If an unparsable character is not enclosed in single quotes, an error message displays.

**Valid Characters:** all alphanumeric characters, hyphen (-), underscore (\_), exclamation point (!), less than (<), greater than (>), pound (#), percent (%), dollar sign (\$), ampersand (&), forward slash (/), backslash (\), pipe (|), opening bracket ([), closing bracket (]), and single quote (').

**NOTE:** You will have to remove the added single quotes from any VBA scripts for operation to succeed.

If a single quote ('') is a literal part of the addressing string syntax, it must be preceded by a backslash (\) in order for the character to be passed to the server as part of the address.

Refer to the documentation supplied with third-party OPC servers for information on server-specific syntax.

## Selecting Data Sources from a List

In addition to entering a data source directly, you can also select one from a list using the Expression Builder dialog box. This dialog box lets you select the data source you want to use, or create expressions by combining two or more data sources together.

You can select data sources from the Expression Builder dialog box by clicking the tab you want and selecting the source from the list. For example, to select an iFIX tag AI1 in the SCADA server SCADA01:

1. Click the FIX32 Database tab.
2. In the Node Names list, select SCADA01.
3. In the Tag Names list, select the desired tag.

If an existing object contains properties, you can also select those properties from a list. For example, to select the Width property of a picture window:

1. Click the Pictures tab.
2. Select the picture you want to modify.
3. In the Properties list, click the WindowWidth property.

As you make selections from the Expression Builder, the text in the lower window changes to match your selections, enabling you to create an expression. If applicable, the tolerance, deadband, or refresh rate also appear in this window. The section [Building Expressions](#) describes how to create expressions, and describes the components of the Expression Builder.

## Filtering Data Sources

Using the Expression Builder dialog box, you can filter data sources to search for specific data at any level. This is a helpful tool for eliminating data that you don't need to access.

To filter data sources, enter the data source string in the Filter field and click Filter. (For the FIX32 Database tabbed page, the Filter button appears as an *F*.) To select from the list box, click the down arrow to the right of the field. You can also search for wildcard entries by using an asterisk in the field. For example, to view all of the F\_ fields for blocks, enter F\_\* in the Filter field.

To find all occurrences starting with a particular string, enter *String\** in the Filter field, where *String* is the text that you want to search for. For example, enter AI\* to find all tags starting with AI.

To find all occurrences which contain a particular string, enter \**String\** in the Filter field, where *String* is the text that you want to search for. For example, enter \*motor\* to find all tags containing the string "motor" in the name.

You can also search for a string with a single unknown character by using the question mark wildcard (?). For example, the search string TAN? locates the string TANK.

## Specifying Data Conversions

After you enter a data source, you need to select the type of data conversion to apply to the data from that source. A data conversion defines how the incoming data should be processed or formatted so that your objects behave according to the properties you have assigned to them. It also defines how the outgoing data calculates errors, what those errors mean, and how they are conveyed to operators.

The following table lists the types of data conversions you can specify in the Data Conversion area of the Animations dialog box.

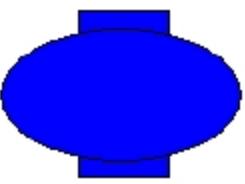
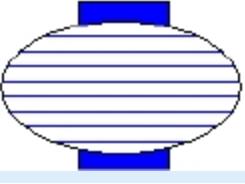
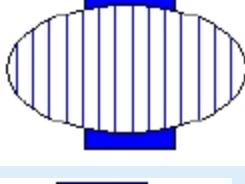
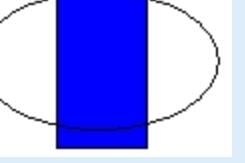
Data Conversion Types																										
The data conversion types lets you specify... version...																										
Range	A range of values on which to animate an object. You can enter the minimum and maximum input and output values. When you enter a range of values, the input values are mapped into the output values, allowing you to apply linear signal conditioning. For information on signal conditioning, refer to the <a href="#">Understanding Signal Conditioning</a> section in the Building a SCADA System manual.																									
Table	<p>You can also specify if input is allowed to the range.</p> <p>A lookup table. Using a lookup table is like using a spreadsheet, as the following figure shows.</p> <p>Double-click here to select a cell in a column or row. To change the value, enter the necessary value.</p> <table border="1"> <thead> <tr> <th></th> <th>Low</th> <th>High</th> <th>Color</th> <th>Blink To</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>0</td> <td>1000</td> <td>(0,0,255)</td> <td>Blue</td> </tr> <tr> <td>2</td> <td>1001</td> <td>9000</td> <td>(255,0,0)</td> <td>Green</td> </tr> <tr> <td>3</td> <td>9001</td> <td>10000</td> <td>(255,0,0)</td> <td>Red</td> </tr> </tbody> </table>							Low	High	Color	Blink To	1	0	1000	(0,0,255)	Blue	2	1001	9000	(255,0,0)	Green	3	9001	10000	(255,0,0)	Red
	Low	High	Color	Blink To																						
1	0	1000	(0,0,255)	Blue																						
2	1001	9000	(255,0,0)	Green																						
3	9001	10000	(255,0,0)	Red																						
Format	<p>When completing a lookup table, you can define a single lookup value or a range of lookup values for each row in the table. In addition, you need to enter an output value. Depending on the selected property, this value may be a color, string, fill style, edge style, or numeric value. When the incoming value from the data source matches an entry in the table, it changes the selected property to match the output value.</p> <p>The buttons below the lookup table help you modify the appearance of the table. You can insert, modify, or delete rows in the table by clicking the appropriate buttons. Or, by clicking the Advanced button, you can assign toggle values, a shared lookup table, a toggle rate, and a tolerance value for exact match thresholds. For more information on these advanced options, refer to the <a href="#">Animating Properties Using Color</a> and <a href="#">Classifying Animations Errors</a> sections. For more information on using the toggle rate, refer to the <a href="#">Using Blinking Thresholds</a> section.</p> <p>How to format the data. You can specify:</p> <ul style="list-style-type: none"> <li>• How to justify the data.</li> <li>• How many lines to display.</li> <li>• How many characters appear on each line.</li> <li>• Whether data entry is allowed and, if so, if it can be entered in-place.</li> </ul> <p>For more information on formatting options, refer to the <a href="#">Adding Data Links</a> section.</p>																									
Object	No signal conditioning. The data received from the data source is processed or displayed at that exact value.																									

## Sample Table Data Conversion

The following table data conversion has been set up for the FillStyle property of an oval.

Low	High	Value
0	25	0-Solid
26	50	2-Horizontal
51	75	3-Vertical
76	100	1-Hollow

Using these definitions, the oval fill style appears as shown in the following table.

When the incoming value is...	The oval appears...
Less than 25	
Between 26 to 50	
Between 51 to 75	
Between 76 to 100	

*Sample Table Data Conversions*

## Classifying Animations Errors

iFIX lets you define how any animation behaves if an error occurs. Using the Output Error Mode field of the Advanced Animations dialog box, you determine how the output data appears to operators. From this field you select the desired error classification based on the specified data conversion method. The output data appears to the user as the specified error type when the default value is reached.

The following table details the error output you can define for a particular data conversion type.

### Error Handling Based on Data Conversion Types

The data conversion... Lets you define errors using... Which gives you the following options...

Range	<ul style="list-style-type: none"> <li>• Current Output</li> <li>• Error Table</li> <li>• Minimum Value</li> <li>• Maximum Value</li> </ul>	<ul style="list-style-type: none"> <li>• Minimum and Maximum Input</li> <li>• Minimum and Maximum Output</li> <li>• Use Offset</li> <li>• Fetch Input Range on Open</li> </ul>
Table	<ul style="list-style-type: none"> <li>• Current Output</li> <li>• Error Table</li> </ul>	<ul style="list-style-type: none"> <li>• Exact Match (and tolerance)</li> <li>• Range Comparison</li> </ul>
Format	<ul style="list-style-type: none"> <li>• Current Output</li> <li>• Error Table</li> </ul>	<p>Display messages in a Data link for any of the following errors:</p> <ul style="list-style-type: none"> <li>• Communication Failure</li> <li>• Data Uncertain</li> <li>• Unknown Failure</li> <li>• Device Failure</li> <li>• Out of Space</li> <li>• Configuration Error</li> <li>• Custom messages for any of the above as entered in User Preferences.</li> </ul>
Object	<ul style="list-style-type: none"> <li>• Exact Value</li> </ul>	No output classification. The data received from the data source is processed or displayed at that exact value.

For more information on the output fields, refer to the [Animating Properties Using Color](#) section.

**NOTE:** Error handling in iFIX is global, not per-object. You can choose the behavior of a single object based on an error condition; however, because of performance reasons, the error classification is applied system-wide.

### Specifying OPC Errors

iFIX provides predefined error defaults that you can customize for your needs. The Animations Data Error Defaults tabbed page of the User Preferences dialog box contains the default OPC error strings and values that display when an error occurs. The tabbed page is divided into three areas:

- **Linear Animation Object Defaults** - Contains six numeric, OPC failure strings based on the Linear object using a Range data conversion.
- **Format Animation Object Defaults** - Contains six OPC strings based on the Format object using a Format data conversion. The error string is displayed in a Data link.
- **Lookup Animation Object Defaults** - Contains six numeric table, string table, and color table entries based on the Lookup object using a Table data conversion.

The error defaults are global, resulting in better system performance. You can modify the defaults to make error messages more intuitive for your specific process. For example, when a device error occurs, Data links display by default the text "XXXX". To create a more intuitive message for device error messages in the future, enter an alternate string in the Device field of the Format Animation Object Defaults area. For example:

Device is not working!

By changing the defaults, you can configure error messages with the text and color that you want, thereby customizing your error handling scheme. For more information on the fields of the Animations Error Defaults tabbed page, refer to the online help.

## Animating Properties Using Color

Applying color to your objects is a visually effective method of using animations in your process environment. One example would be changing the foreground, edge, and background color of objects to give your operators visual cues about the process values or alarm conditions.

When animating the color of an object, you must define a *color threshold*. A color threshold is either a color and value combination or a color and alarm combination. You can define the following types of color thresholds:

- Color by analog value
- Color by digital value
- Color by current alarm
- Color by latched alarm

For each type of threshold, specify one or more rows in a lookup table. When coloring by analog value, each row in the lookup table defines a color and either a single value or a range of values that you want to associate with the color. When coloring by alarm, each row defines the color and the associated alarm.

**NOTE:** Any time a data source changes, iFIX refreshes the color tables. To avoid problems when modifying a color table, be certain that all your changes are correct.

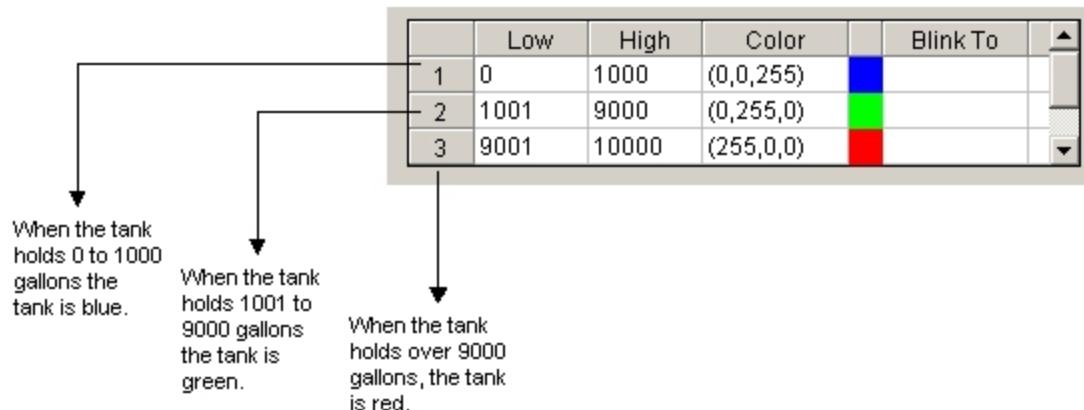
The following sections show you how to define color thresholds using the methods introduced above. Refer to the [Specifying Data Conversions](#) section for information on how to use lookup tables.

- [Color by analog value](#)
- [Color by digital value](#)
- [Color by current alarm](#)
- [Color by latched alarm](#)
- [Using Blinking Thresholds](#)
- [Using Shared Thresholds](#)

### Color by Analog Value

When you color objects by their analog value, you enter a key value or a range of key values and assign them to a color. When the data source value falls within the threshold, the object changes to that color.

For example, let's say a factory controls a tank of water for cleaning and manufacturing purposes. When the water in the tank falls below 1000 gallons, the pumps from the main water supply turn on and refill the tank. When the water in the tank rises above 9000 gallons, the pumps shut off. The thresholds for this tank are shown in the following figure.

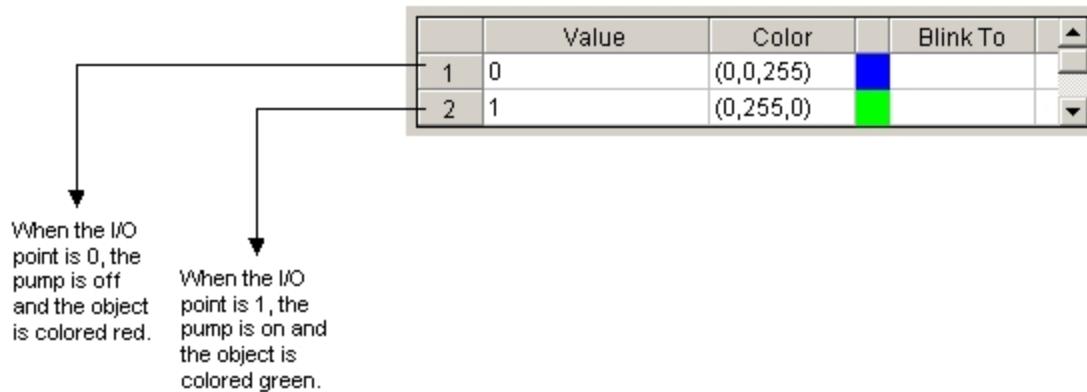


When operators see the tank change color, they can also determine whether the pumps have turned on (blue) or off (red). To color an object by analog value, select the Range Comparison option button on the Color Expert and edit the minimum and maximum values of the lookup table as desired.

For more detailed information on animating objects, refer to the [Animating Object Properties](#) chapter.

## Color by Digital Value

Color thresholds can be useful with digital values, too. Suppose you assign the following thresholds to an object that monitors the status of a pump. The data source for this object is a digital I/O point in an OPC server.



When the value is not in the table, the object is colored black.

Using digital values lets you define thresholds based on an exact match and a tolerance. When you specify an *exact match*, you declare that you only want to change an object's color when the data source exactly matches the threshold value you have assigned to that color, plus or minus a specified *tolerance* (the allowable deviation from that value). Tolerances only apply to table conversions where the configuration is set to exact match.

**NOTE:** How the output data is displayed depends on how you classify error handling in the Advanced Animations dialog box. For more information, refer to the [Classifying Animations Errors](#) section.

To color an object by digital value, select the Exact match option button on the Color Expert and assign digital values to the colors you want to use. If desired, enter a tolerance value in the Exact Match Tolerance field. The default tolerance is 0. If you are using VBA, set the Tolerance property of the Lookup object.

## Color by Current Alarm

Depending on your data source, an animated object can receive a variety of alarms. You can set up thresholds to visually alert an operator that a data source is in a particular alarm state. By using color by current alarm, the object always displays the color assigned to the current alarm.

When the data source is an iFIX process database, tag alarms can also provide data on more than just control limits. For example, suppose that the speed at which the tank fills is crucial to the process. To effectively monitor this condition, you could set up another threshold using the Rate of Change alarm state.

For more information on coloring by current alarms, refer to the [Implementing Alarms and Messages](#) manual.

## Color by Latched Alarm

When a data source is in more than one alarm state that has defined thresholds, the latched alarm strategy displays the color assigned to the unacknowledged alarm of the highest priority.

For more information on coloring by latched alarms, refer to the [Implementing Alarms and Messages](#) manual.

## Using Blinking Thresholds

In addition to a color threshold, you can define a blinking threshold for current and digital values. The blinking threshold replaces the object's foreground, background, or edge color when the assigned value is reached or the assigned alarm occurs. The color of the object blinks between the threshold color and the background color.

To assign a blinking threshold using the Color Expert, double-click the Blink To cell in the row of a value and select the color you want to assign to the threshold. You can access the Color Expert via the tool-box or by selecting the Color Animation button in the Basic Animation dialog box. Using the Advanced Animations dialog box, you can also define blinking threshold values using the New Level dialog box. Click the Toggle option button in the Output area and enter the output value of the blinking threshold in the field.

### Blinking on a New Alarm

You can also set a selected object to blink every time the data source registers a new alarm. The object stops blinking when the alarm is acknowledged. This setting overrides the blinking settings defined for individual thresholds. With the Blink on New Alarm check box selected, you can set the color for the blink by clicking the Blink on New Alarm Color check box.

For examples of how to use blinking thresholds in your alarming scheme, refer to the [Implementing Alarms and Messages](#) manual.

## Blinking Rate

The rate at which objects blink is defined in Advanced Lookup Options dialog box. This dialog box also lets you select the source and value of the toggle rate that causes the blinking action. The configurable blink speed allows you to set the threshold to blink at a set rate, in seconds. To set the blink speed, enter a value in the Toggle Rate field.

For more information on advanced options with the lookup table, refer to the [Specifying Data Conversions](#) section.

## Using Shared Thresholds

If a lookup object is shared (in either a global data source or in another picture), you can use its color table to define a threshold.

On the Color Expert, click the Use Shared Table check box and then, in the Shared Table field, enter the data source for the shared color table. Click the Browse button to make a selection from a Picture or a Global data source available in your system.

You can open the Color Expert by clicking on the Color Expert button in the toolbox, or by selecting a specific Color Animation in the Basic Animation dialog box.

## Animating Object Properties with Visual Basic

You can animate object properties by selecting the properties you want to dynamically change, selecting a data source, and defining how the data will be processed (the *data conversion*). To create custom animations, you can write a VBA script. To write a script for an object, right-click the object and select Edit Script from the pop-up menu. This starts the Visual Basic Editor.

When you write a script to animate an object, the script must define:

- The object that you want to animate.
- The properties to dynamically change.
- The parameters to use when processing data.

The parameters you specify vary depending on the type of data conversion you want to use. For example, if you want to use a Table data conversion, the parameters are cells of the table. Alternately, if you want to use a Range data conversion, the parameters are the minimum and maximum input and output values.

After defining these items in your script, you must connect the data source to the object you want to animate.

### ► To connect the data source to the object you want to animate:

1. Connect the data source to the input of the data conversion.
2. Connect the output of the data conversion to the object you want to animate.

For more information on writing scripts that animate the properties of an object, refer to the [Writing Scripts](#) manual.

## Animating a Grouped Object

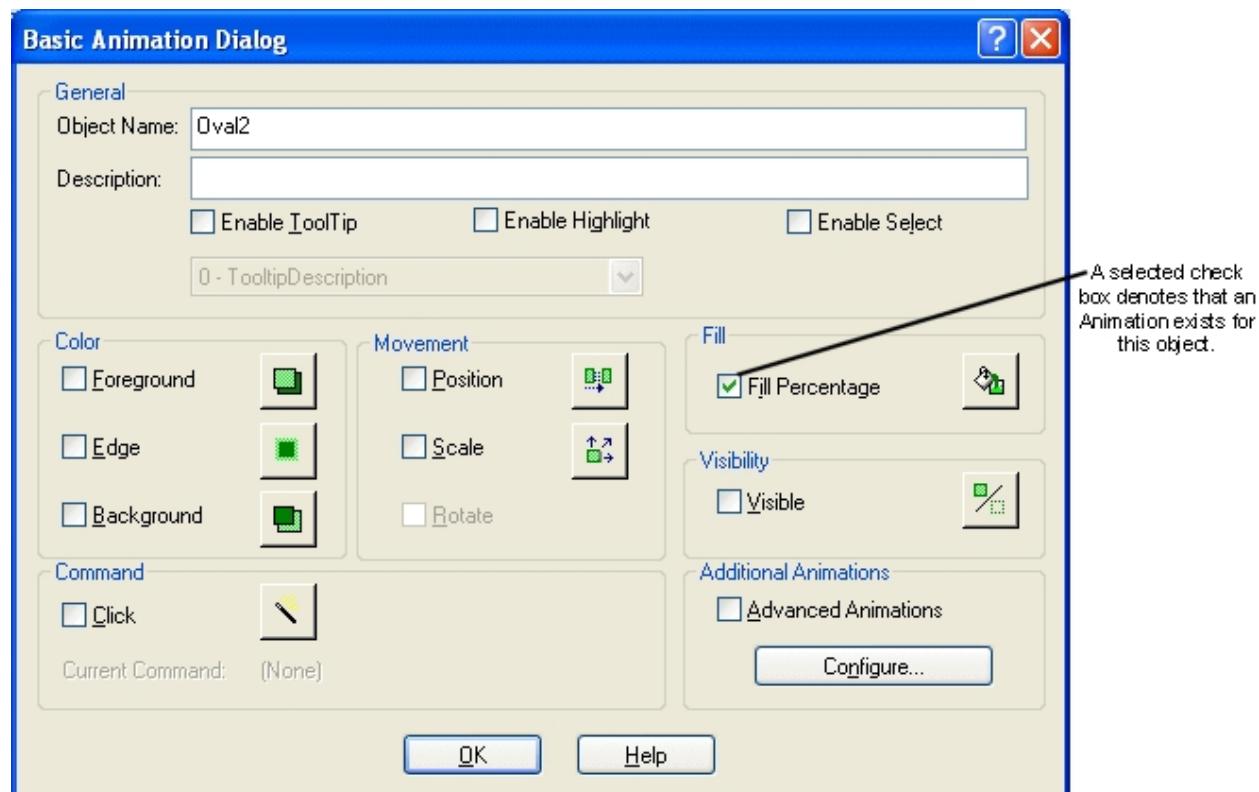
In addition to animating individual objects, you can also animate grouped objects. Animating a grouped object is similar to animating any other object, except that the objects inside the group can have independent animations. To animate a grouped object, select the group and animate the properties you wish using the appropriate Expert. The properties of the group are changed to reflect your entries.

To animate the member objects of a group, drill down to the object in the group that you want to animate and complete the necessary entries in the appropriate Expert. If the group has an animated property, and one of its member objects has the same property animated in a different way, the most recent animation takes precedence. For example, if you animate the group's ForegroundColor property, and then in turn animate a nested object's ForegroundColor property, you will see the nested object's animation when you run the picture.

You can also use the Basic Animation dialog box to animate a grouped object or member objects in a group. For more information on working with grouped objects and their members including drilling down, refer to the [Creating Complex Objects](#) section.

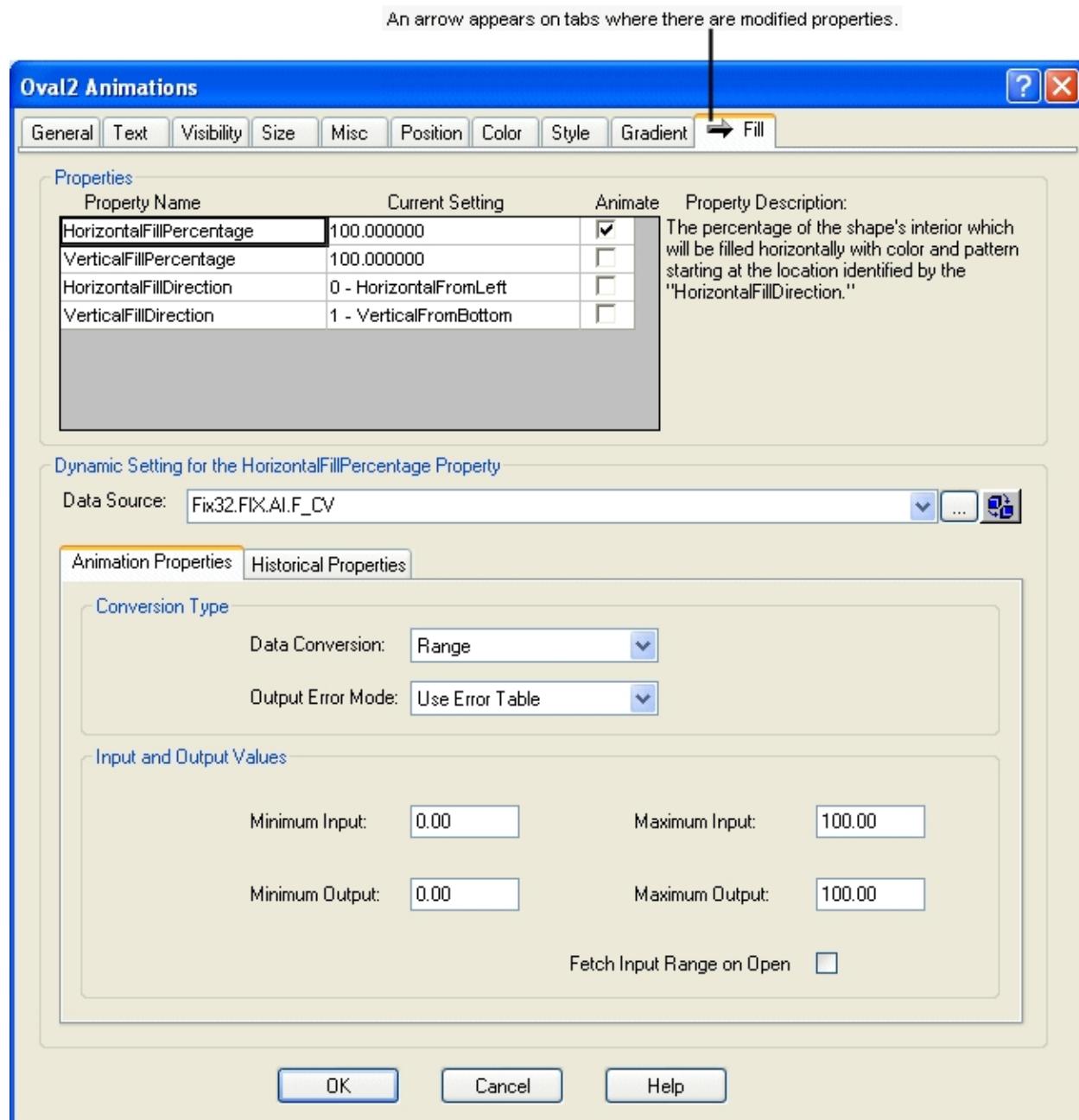
## Modifying Animations

There may be times when you must change the animations you create. Modifying animated objects is similar to creating them. The main difference is that when you open either of the Animation dialog boxes, any properties that have been dynamically changed are indicated by a selected check box (Basic) or an arrow on its corresponding tab (Advanced), as the following figures show.



Modifying a Fill Animation in the Basic Animation dialog box

To modify an existing Animation in the Basic Animation dialog box, click the Expert button associated with that animation. This opens the Expert dialog box and allows you to make changes to that animation. Clearing the check box deletes the existing animation.



#### Modifying a Fill Animation in the Advanced Animations Dialog Box

To modify an existing animation in the Advanced Animations dialog box, select the tab containing the property you want to change and click Animate. Perform any required modifications and click OK.

## Deleting Animations

When you no longer need an animation, you can delete the animation or the object that contains the animation. Deleting animations removes the animation from the property to which it was assigned.

**CAUTION:** Deleting an animation permanently destroys your selections. Do not delete an animation unless you understand the effect it will have on your objects and pictures.

## Building Expressions

As described earlier, there are many data sources you can use to animate the properties of an object. Another valuable option is to use an *expression*. An expression is a data value or multiple data values connected with one or more operators. Using the Expression Builder, you can create specific expressions that access data from unique sources. This gives you more flexibility when assigning dynamic object properties.

You can use the following data values in an expression:

- Numeric constants.
- Strings enclosed in quotation marks (" ") .
- iFIX tags.
- GE Historian tags.
- OPC server I/O addresses.
- Picture properties.
- Object properties.

**NOTE:** Fetching data limits at runtime for an expression with more than one data source is not supported and may produce unexpected results at runtime. This is because there could be different tag names in the expression and it may not be clear which tag to fetch the limits for.

## Using the Expression Builder Dialog Box

The Expression Builder dialog box is your tool for creating expressions. This dialog box lets you select the data source you want to use or create expressions by combining two or more data sources together.

The Expression Builder dialog box is divided into multiple tabs, which are described in the following table.

**Expression Builder Tabs**

The tab...	Displays...
FIX Database	Any SCADA servers to which your computer is communicating. Use a data server as a data source when you want to animate an object or an iFIX tag. The tabbed page includes Node Names, Tag Names, and Field Names windows to help you specify your selections.
Pictures	The pictures residing on your computer. The Objects window displays each object in the picture. Use one of these objects as a data source when you want to animate an object with a picture or object property value. The Properties window displays the properties for the selected object so that you can select a specific property.
Globals	Global data sources. The tabbed page includes Objects and Properties windows to help you specify your selections.

Data Servers	Third party OPC servers. Data source connections to data servers fire at run-time only.
Alarm Counters	A filtered list of SCADA servers that your computer is communicating with. The tabbed page includes the Alarm AreaTag Names window that displays a filtered list of alarm areas on the selected SCADA and alarm counter tags. The Alarm Counter Field Names window displays a filtered list of fields available from the selected area.
GE Historian	Any GE Historian Server to which your computer is communicating. Use a GE Historian Server data source when you want to animate an object. The tabbed page includes Node Names and Tag Names windows to help you specify your selections.

When you select a data source, it appears in the field at the bottom of the dialog box. You can add strings by typing them into the field. You can also add operators and numeric constants by typing them into the field, or by clicking the operator buttons on the right side of the dialog box while the cursor is in the field. To display the operator buttons, click the Mathematical Functions button.

**NOTE:** If you have created an object-to-object connection, such as the fill percentage of one tank to another, or created a connection to a data source, the animated properties display in boldface in the Properties list of the Pictures tab for the selected object.

The Filter fields and buttons allow you to filter data sources. For more information, refer to the [Filtering Data Sources](#) section. Additionally, you can specify a tolerance, deadband, and refresh rate in the appropriate fields. These functions are described later in this section.

For more information on selecting data sources from the Expression Builder dialog box, including examples, refer to the [Selecting Data Sources from a List](#) section.

## Customizing the Expression Builder

You can customize the Expression Builder by showing or hiding specific tabs. To do this, you modify properties in VBA. Refer to the following table.

### Showing or Hiding Tabs in the Expression Builder

To show or hide the tab...	Set this property to TRUE or FALSE, respectively...
FIX32 Database	ShowDatabaseTab
Pictures	ShowPicturesTab
Globals	ShowGlobalsTab
Data Servers	ShowDataServersTab
GE Historian	ShowProficyHistorianTab

For more information on modifying VBA scripts, refer to the [Writing Scripts](#) manual.

## Specifying Tolerance, Deadband, and Refresh Rate

The Expression Builder also lets you define the tolerance, deadband, and refresh rate of a data source connection. These three fields, located at the bottom-right of the dialog box, are defined as follows:

- **Tolerance** - the allowable deviation from a value when evaluating an expression.
- **Deadband** - how much the current data value can deviate from the most recent data value.

- **Refresh Rate** - how often the data source connection updates, in seconds.

All three of these characteristics apply to a particular connection; they are *not* global. For example, if you connect the object RECT2.PROP1 to source FIX32.NODE.TAG.F\_CV, you can specify different refresh rates for the rectangles properties, even though the object references the same database tag.

To enter a refresh rate enter a rate, in seconds, in the Refresh Rate field. Refer to the following table to determine how fast the connections will update based on the refresh rate you enter.

Refresh Rates	
If you choose a refresh rate of...	Then the data source connection will update no faster than...
0.0	Once per 50 milliseconds.
0.1	Five times per second.
1.0 (default)	Once per second.
5.0	Once per 5 seconds.
10.0	Once per 10 seconds.
15.0	Once per 15 seconds.
30.0	Once per 30 seconds.
60.0	Once per 60 seconds.

To enter a tolerance or deadband limit, enter a value in the Tolerance or Deadband fields, respectively.

**NOTE:** The Tolerance setting in the Expression Builder is for the expression only. To set the tolerance for an Exact Match Lookup Table, you must use the Animations Dialog box. For more information, refer to the [Classifying Animations Errors](#) section.

For more information on refresh rate, refer to the [Increasing the Refresh Rate](#) section in the Setting up the Environment manual.

## The Importance of Syntax

Since the Expression Builder relies on specific data values input by users, the manner in which the data is presented is crucial. This is why it is important for you to know the proper syntax of your expressions. One of the most common errors in building expressions is that the expression has been entered incorrectly. Throughout this chapter, the correct syntax for specific entries is described with specific examples.

### Syntax: Required Format for Expressions

Expressions require the following syntax:

```
value
value operator value
```

where *value* is a constant or a data source and *operator* is a mathematical, relational, or boolean symbol.

## Operators: Applying the Glue to Your Expressions

The operators in expressions are symbols that not only let you connect data values together but also determine how the values work together to convert the data source. The following types of operators are permitted in your expressions:

- Mathematical operators
- Relational operators
- Boolean operators

To access these operators, click the Mathematical Functions button on the Expression Builder dialog box and select them from the expanded operator keypad. You can also add numerals to your expressions by clicking the appropriate numeral in the Numeric area.

In addition to these operators, the Expression Builder allows you to select a set of functions. These functions are not shown on the expanded operator keypad and must be entered manually. The following table summarizes the available functions and their syntax. All trigonometric functions require values entered in radians.

When you select the function...	The Expression Builder calculates the...	Syntax
ABS	Absolute value of <i>number</i> .	ABS ( <i>number</i> )
ACOS	Arccosine of <i>number</i> .	ACOS ( <i>number</i> )
ASIN	Arcsine of <i>number</i> .	ASIN ( <i>number</i> )
ATAN	Arctangent of <i>number</i> .	ATAN ( <i>number</i> )
COS	Cosine of <i>number</i> .	COS ( <i>number</i> )
EXP	Anti-log of <i>number</i> .	EXP ( <i>number</i> )
INT	Integer value of <i>number</i> .	INT ( <i>number</i> )
LOG	Natural log of <i>number</i> .	LOG ( <i>number</i> )
LOG10	Base 10 log of <i>number</i> .	LOG10 ( <i>number</i> )
SIN	Sine of <i>number</i> .	SIN ( <i>number</i> )
SQRT	Square root of the <i>number</i> .	SQRT ( <i>number</i> )
TAN	Tangent of <i>number</i> .	TAN ( <i>number</i> )

For more information on these functions, refer to the [Working with Functions](#) section in the Creating Recipes manual.

The operators and their associated syntax are described in the following sections with examples of each.

### Mathematical Operators

Mathematical operators let you add, subtract, multiply, and divide two or more values. Using these operators, you can create a mathematical expression. You can also change the operator's order of precedence in the mathematical expression by using parentheses.

Mathematical expressions are evaluated by determining the data value on each side of the mathematical operator and then performing the mathematical operation. For example, consider the following expression:

5+Fix32.SCADA1.AI1.F\_CV

When this expression is evaluated, the current value of the iFIX tag AI1 is determined and then it is added to 5. If the value is 50, for example, the expression evaluates to 55.

Because of the way the expressions are evaluated, the values on both sides of an operator must both be either a numeric value or a string, but not one of each. You *cannot*, for example, add the descriptive string "Pump1 for Main Water Supply" to the data source Fix32.SCADA1.AI1.F\_CV. However, you *can* add that same string to the data source Fix32.SCADA1.AI1.A\_DESC.

### Syntax: Mathematical Operators

The syntax for each mathematical operator is provided in the following table:

Operator	Syntax
+	<code>value + value</code>
-	<code>value - value</code>
*	<code>value * value</code>
/	<code>value / value</code>
( (left parenthesis)	<code>(value + value) * value</code>
) (right parenthesis)	<code>(value + value) * value</code>

### Example: Mathematical Operators

Consider the following expressions:

Expression	Value
<code>5+Fix32.SCADA1.AI1.F_CV</code>	The current value of AI1 plus 5. If AI1 is 100, the expression evaluates to 105.
<code>"5"+Fix32.SCADA1.AI1.A_CV</code>	The current value of AI1 and the string "5" concatenated together. If AI1 is 100, the expression evaluates to 1005.
<code>Fix32.SCADA1.AI5.F_CV*OPC1.N35</code>	The product of the iFIX tag AI5 and the I/O address N35. If the tag's value is 100, and the I/O point's value is 50, the expression evaluates to 5000.
<code>Alarms.Rect1.Width/Alarms.Rect1.Height</code>	The quotient of Rect1's width divided by its height. If both properties are equal, the expression evaluates to 1.
<code>Alarms.Pump5.HorizontalFillPercentage + Fix32.SCADA1.AI1.F_CV</code>	The value of Pump5's HorizontalFillPercentage property plus the current value of the iFIX tag AI1. If the HorizontalFillPercentage property's value is 50 and AI1's value is 100, the expression evaluates to 150.
<code>Alarms.Prompt.Caption+"Enter tagname"</code>	The value of Prompt's Caption property and the string "Enter tagname" concatenated together. If the Caption property value is null, then the string evaluates to "Enter tagname".

### Relational Operators

Relational operators let you compare two values to determine how they relate to each other.

### Syntax: Relational Operators

The syntax for relational operators is shown in the following table.

Operator	Syntax
= (equal to)	<code>value = value</code>
<> (not equal to)	<code>value &lt;&gt; value</code>
> (greater than)	<code>value &gt; value</code>
< (less than)	<code>value &lt; value</code>

`>=` (greater than or equal to)  
`<=` (less than or equal to)

`value >= value`  
`value <= value`

### Example: Relational Operators

Relational operators are commonly used in boolean conditions to determine if part or all of an expression is true or false. An example:

```
Fix32.SCADA1.AI1.F_CV = 50
```

When this expression is evaluated, the value of the left side of the operator is compared to the right side. If the two values match, the condition is true. Otherwise, it is false.

You can compare any data value to any other data value. For example, consider the following boolean conditions:

Condition	Value
<code>3&gt;1</code>	TRUE
<code>5 = "Enter tagname"</code>	FALSE
<code>Fix32.SCADA1.AI1.F_CV = 100</code>	TRUE, if the current value of AI1 is 100.
<code>Fix32.SCADA1.AI1.F_CV &gt;= OPC1.N35</code>	TRUE, if the current value of AI1 is greater than OPC1.N35.
<code>Alarms.Rect1.Width = Alarms.Rect1.Height</code>	TRUE, if Rect1 is a square.
<code>Alarms.Prompt.Caption = "Enter tagname"</code>	TRUE, if the value of Prompt's Caption property is "Enter tagname".

### Boolean Operators

Boolean operators let you connect two or more boolean conditions.

#### Syntax: Boolean Operators

The syntax for each operator is listed in the following table.

Operator	Syntax
AND	<code>condition AND condition</code>
OR	<code>condition OR condition</code>
NOT	<code>NOT condition</code>

#### Example: AND Operator

The AND operator is used when both parts of the expression must be true. For example, suppose that in a factory, several ingredients need to be mixed together for up to 5 minutes while the mixture is being heated to 200 degrees. When both of these conditions (5 minutes and 200 degrees) are true, you want to create an expression to display the following text:

```
Mixing...
```

To accomplish these tasks, a rectangle object, MixTime, has been set up as a progress bar to show the time elapsed as a percentage. A text object, Temperature, has also been animated to show the current temperature.

Next, a text object needs to be created for the Mixing message. This object needs its Visible property animated with the following expression:

```
Mixing.MixTime.VerticalFillPercentage < 100 AND Mixing.Temperature.AnimatedCaption.InputValue < 200
```

This expression is true only when the mixing time is less than 5 minutes and the temperature is less than 200 degrees. When either condition is no longer true, the mixer stops and the message is no longer visible.

### Example: OR Operator

Now suppose you want to display instructions to the operator about the next stage of the process when mixing stops. To do this, you can create another text object and animate its Visible property with the following expression:

```
Mixing.MixTime.VerticalFillPercentage >= 100 OR Mixing.Temperature.AnimatedCaption.InputValue >= 200
```

### Example: NOT Operator

Unlike AND or OR, the NOT operator does *not* connect two boolean conditions. Instead, it inverts the value of a condition. For example, if the following condition is true:

```
Alarms.Tank3.HorizontalFillPercentage>80
```

then the following condition is false:

```
NOT Alarms.Tank3.HorizontalFillPercentage>80
```

### Changing the Order of Precedence

When evaluating an expression, iFIX defines an order of precedence for each operator. The order of precedence determines which operators (and the values on each side of the operator) are evaluated first. The following table lists each operator from highest to lowest precedence.

Operator	Precedence
( ), NOT, - (unary minus)	1
*, /, AND	2
+,- (subtraction), OR	3
<, <=, >, >=	4
=, <>	5

You can change the order of precedence by enclosing an expression in parentheses. Parentheses are regarded with the highest priority; thus all expressions within the parentheses are evaluated first. Operators with the same precedence are evaluated in the order they appear from left to right.

### Example: Changing the Order of Precedence

For example, consider the following expressions:

Expression	Value
6+4/2	8
(6+4)/2	5

### Bit Operators for Expressions

The GETBIT function allows for bit-level manipulations of data. The GETBIT function has the following syntax:

```
GETBIT ( nBitNumber,, nNumBits, uiSourceToken )
```

The source token is promoted to the closest unsigned integer data representation that maintains its length. The corresponding zero based range of bits (bit zero is the most significant bit) is extracted from the source and an integer is returned which corresponds to the value these bits define if they existed starting in the least significant bit of their own integer. For example:

```
GETBIT ( 8, 4,N.T.F)
```

**IMPORTANT:** Be aware that you must have spaces in between the operator and operands in expressions.

## Modifying Expressions

You can modify an expression by editing the entry in the Data Source field of either the Expert, or the Animations or Expression Builder dialog boxes. We recommend using the Expression Builder, as you can more easily enter new data sources by selecting or typing them into the field. To delete an expression, right-click the expression and select Delete.

## Accessing the Animation Dialog Boxes

iFIX provides the following options for configuring Animations:

- **Experts** - In the iFIX WorkSpace, select the appropriate Expert from the Experts toolbar, or the Task Wizard (Classic or Ribbon views) or on the Tools tab, in the Animations group, Animations list (Ribbon view). If the Toolbox is enabled, click the button on the Toolbox.
- **Basic Animation dialog box** - In the iFIX WorkSpace, double-click an object or select Animations from the right-click menu. This dialog box contains many commonly used animations. For a listing of all animations available to an object, use the Advanced Animations dialog box.
- **Advanced Animations dialog box** - Click the Configure button on the Basic Animation dialog box; or, if configured, the Advanced Animations dialog box appears when you double-click an object in the iFIX WorkSpace or select Animations from the right-click menu.

**NOTE:** To configure the Advanced Animations dialog box to always appear when you double-click an object or select Animations from the right-click menu, clear the Always Show Basic Animation dialog box option on the Picture Preferences Tab of the User Preferences dialog box.

## Selecting a Data Source from a List

### ► To select a data source from a list:

1. In the iFIX WorkSpace, select an object.
2. Open either of the Animation dialog boxes.
  - If you are using the Advanced Animations dialog box, select the tab containing the property you want to change and select the applicable Animate check box. The dialog box expands to display the applicable animation properties.
  - If you are using the Basic Animation dialog box, select the appropriate Animation Expert button.
3. Click the Browse button to the right of the Data Source field.
4. Click the tab containing the data source.

5. Select the I/O point, tag, or property you want to use as a data source and click OK. The selected data source appears in the Data Source field.

## Creating an Animation Using the Basic Animation Dialog Box

### ► To create an animation using the Basic Animation dialog box:

1. In the iFIX WorkSpace, select the object you want to animate.
2. Select Animations from the right-click menu. The Basic Animation dialog box appears.

**NOTE:** The Basic Animation dialog box appears the first time you access Animations in iFIX. To configure the Advanced Animations dialog box to always open when you double-click an object or select Animations from the right-click menu, clear the Always Show Basic Animation dialog box option in the Picture Preferences Tab of the User Preferences dialog box.

3. Select the check box of the animation property that you want to add to your object. The associated Animation Expert dialog box opens.

If the Animation that you want to add is not listed in the Basic Animation dialog box, click the Configure button to open the Advanced Animations dialog box. The Advanced Animations dialog box contains all available animations for the selected object. For more information on creating objects in the Advanced Animation dialog box, refer to the Working with Advanced Animations Overview.

4. Enter the configuration information for the Animation Expert.

The added Animation property is now selected in the Basic Animation dialog box.

5. Add any additional animations or click OK to close the dialog box.

## Modifying an Animation in the Basic Animation Dialog Box

### ► To modify an animation using the Basic Animation dialog box:

1. In the iFIX WorkSpace, right-click an object and select Animations. The Basic Animation dialog box appears.
2. Click the button of the animation property that you want to modify. The associated Animation Expert dialog box opens.

**IMPORTANT:** If you select the check box, you will delete your animation. To modify an animation, you must click the button to access the Expert dialog box.

3. Make any required modifications to the animation and click OK to return to the Basic Animation dialog box.

## Animating Grouped Objects

### ► To animate a grouped object:

1. In the iFIX WorkSpace, right-click the group you want to animate, and select Animations. The Basic Animation dialog box appears.

2. Click the appropriate Expert button.
3. Enter the configuration information for the Animation Expert.

## Deleting an Animation in the Basic Animation Dialog Box

### ► To delete an animation using the Basic Animation dialog box:

1. In the iFIX WorkSpace, select Animations from the object's right-click menu. The Basic Animation dialog box appears. If a property contains an animation, the check box is selected.
2. Clear the check box to delete the animation.

Based on your User Preferences settings, you may be prompted to acknowledge this action by clicking Yes. To configure whether or not you are prompted upon deleting an animation, modify the Prompt on Delete option in the Picture Preferences tab of the User Preferences dialog box.

**IMPORTANT:** To delete all animations you configured in the Advanced Animations dialog box, clear the Advanced Animations check box. If you have assigned multiple animations from the Advanced Animations dialog box, be aware that you will be deleting all of those animations. If you have multiple animations assigned in the Advanced Animations dialog box, it is recommended that you delete them separately within the Advanced Animations dialog box itself.

## Modifying an Animation in the Advanced Animations Dialog Box

### ► To modify an animation using the Advanced Animations dialog box:

1. In the iFIX WorkSpace, double-click the object you want to modify. The Basic Animation dialog box appears.
2. Click the Configure button. The Advanced Animations dialog box appears.
3. Select the tab containing the property you want to change.
4. If necessary, in the Data Source field, change the data source you want to use.
5. If appropriate, on the Animation Properties tab, change the type of data conversion you want and complete the related fields.
6. If appropriate, on the Historical Properties tab, change the start date, start time, time zone, historical mode, duration, or update rate.

## Deleting Animations in the Advanced Animations Dialog Box

### ► To delete an animation using the Advanced Animations dialog box:

1. In the iFIX WorkSpace, double-click the object you want to modify. The Basic Animation dialog box appears.
2. Click the Configure button. The Advanced Animations dialog box appears.
3. Select the tab containing the animation you want to delete. Look for tabs with arrows to help you navigate to properties that have been animated.
4. Clear the Animate check box for the property that contains the animation you want to delete.
5. Click OK to save your changes and close the dialog box.

## Entering a Property Value in the Advanced Animations Dialog Box

► To enter a property value in the Advanced Animations dialog box:

1. In the iFIX WorkSpace, double-click the object you want to modify. The Basic Animation dialog box appears.

**NOTE:** For some objects, you must right-click the object and select Animations from the pop-up menu.

2. Click Configure. The Advanced Animations dialog box appears.
3. Click the tab containing the property you want to change.
4. In the row containing the property you want to change, click the Animate button. The Dynamic Settings area appears.
5. In the Dynamic Settings area, enter the desired value(s) for the property.

## Changing Properties Using the Property Window

► To change a property using the Properties window:

1. In the iFIX WorkSpace, right-click the object you want to modify and choose Property Window. The Properties dialog box appears.
2. Locate the property you want to change in the left column of the window and double-click its row.
3. If the property lets you enter a new value, enter that value and press Enter. After you enter the new value, the object changes to reflect your entry.

**NOTE:** If the property displays a drop-down list, select the new value from the list. If the property is a Boolean value, double-clicking will automatically toggle the value. If the property displays an ellipsis button, click the button to open the appropriate dialog box where you can make the required changes.

## Entering Highlight Timeout Intervals

► To enter a Highlight Timeout Interval:

1. In Classic view, in the iFIX WorkSpace, from the WorkSpace menu, select User Preferences.

-Or-

In Ribbon view, on the Home tab, in the WorkSpace group, click Settings, and then click User Preferences.

2. Click the Picture Preferences tab.
3. In the Window Properties area, select the Click and Stick Enabled check box.
4. In the Properties area, enter a value in the Highlight Timeout Interval field to define the time period. The value must be entered in seconds.

## Filtering Data Sources

► To filter data sources:

1. In the iFIX WorkSpace, double-click an object. The Basic Animation dialog box appears.
2. Open the Advanced Animations dialog box, or click the appropriate Expert in the Basic Animation dialog box.  
If you are using the Advanced Animations dialog box, select the tab containing the property you want to change and select the applicable Animate check box. The dialog box expands to display the applicable animation properties.
3. Click the Browse button to the right of the Data Source field.
4. Click the appropriate tab containing the data source you want.
5. In the Filter field, enter a data source name or select one from the drop-down list. If desired, use the asterisk wildcard character to search for data source names.
6. Click Filter or, if you are on the FIX Database or Alarm Counters tabbed page, click F.

## Creating Expressions

► To create an expression:

1. In the iFIX WorkSpace, double-click an object. The Basic Animation dialog box appears.
2. Click the Configure button. The Advanced Animations dialog box appears.
3. Select the tab containing the property you want to change and select the appropriate Animate check box.
4. Click the Browse button to the right of the Data Source field.
5. Click the appropriate tab and select the data source you want.
6. If you want to combine another data source in the expression, click the Mathematical Functions button and enter an operator.

## Modifying Expressions

► To modify an expression:

1. In the iFIX WorkSpace, double-click an object. The Basic Animation dialog box appears.
2. Click the Configure button. The Advanced Animations dialog box appears.
3. Select the tab containing the property you want to change and select the appropriate Animate check box.
4. Click the Browse button to the right of the Data Source field.
5. Select the desired data source.
6. If you want to combine another data source in the expression, click the Mathematical Functions button and enter an operator using the expanded keypad.
7. Select another data source or enter a numeric value, string, or Boolean condition. Repeat steps 4 to 6 until you create the desired expression.

## **Deleting Expressions**

► **To delete an expression:**

1. In the iFIX WorkSpace, double-click an object. The Basic Animation dialog box appears.
2. Click the Configure button. The Advanced Animations dialog box appears.
3. Select the tab containing the animation you want to modify.
4. Select the property that contains the animation that you want to modify.
5. Select the desired data source.
6. Highlight the expression and press Delete.

## **Data Conversions, Error Defaults, and Threshold Tables**

In the iFIX WorkSpace, you can perform the following steps with data conversions, error defaults and threshold tables:

- [Completing a Range Data Conversion](#)
- [Completing a Table Data Conversion](#)
- [Completing a Format Data Conversion](#)
- [Modifying Animations Error Defaults](#)
- [Assigning Blinking Thresholds](#)
- [Setting the Blink Speed](#)

### **Completing a Range Data Conversion**

► **To complete a range data conversion:**

1. In the iFIX WorkSpace, double-click the object you want to modify. The Basic Animation dialog box appears.
2. Click Configure. The Advanced Animations dialog box appears.
3. Click the tab containing the property you want to change, and select the Animate check box next to that property.
4. From the Data Conversion list, select Range.
5. In the Minimum Input and Minimum Output fields, enter the minimum input and output values, as needed.
6. In the Maximum Input and Maximum Output fields, enter the maximum input and output values, as needed.

7. If you want the selected object to read a value from the data source when the picture opens, select the Fetch Input Range on Open check box.
8. If you want to perform an animation on an object in its current position, not in the absolute position specified by the logical unit or postscript point value in the Minimum Output field, select the Use Offset check box.

## Completing Table Data Conversion

► To complete a table data conversion:

1. In the iFIX WorkSpace, double-click the object you want to modify. The Basic Animation dialog box appears.
2. Click Configure. The Advanced Animations dialog box appears.
3. Click the tab containing the property you want to change, and select the Animate check box next to that property.
4. From the Data Conversion list, select Table. Make sure you have the correct number of rows in the table. If you do not, click the Insert Row button to add a row. If you have too many rows, click the Delete Row button to remove a row from the table.
5. Select either the Range Comparison option (to define a range of values for each row in the lookup table) or the Exact Match option (to define a single digital value for each row in the lookup table).
6. Do one of the following:
  - Enter the high and low values for each row in the lookup table.
  - Enter a single lookup value in the Value column for each row in the lookup table.
7. Enter or select the comparison value for each row in the lookup table by doing one of the following:
  - If you want to define a color, double-click the color you want to modify and select a new one from the Color dialog box when it appears.
  - If you want to enter a string or a numeric value, enter it into the cell.
  - If you want to select a value from a list, click the down arrow button to display the list of options and select the value you want.
8. If you want the object to blink, enter a blink value for each row in the lookup table.

## Completing a Format Data Conversion

► To complete a format data conversion:

1. In the iFIX WorkSpace, double-click the object you want to modify. The Basic Animation dialog box appears.
2. Click Configure. The Advanced Animations dialog box appears.
3. Click the tab containing the property you want to change, and select the Animate check box next to that property.

4. From the Data Conversion list, select Format.
5. In the Type field, specify whether you want to write data to the database. In-Place allows the user to write to the database.
6. Select the Confirm check box if you want operators to confirm each entry they make.
7. From the Justify list, select how to justify the data on the screen.
8. From the Type list, select the type of data.
9. If the data type is alphanumeric, enter the number of lines to display in the Lines field and the number of characters per line in the Chars/Line field. If the data type is numeric, enter a value of 0 to 7 in the Whole Digits field and 0 to 5 in the Decimal field.
10. Select the Raw Format check box if you want to display data in its raw format.

## **Modifying Animations Error Defaults**

► **To modify animations error defaults:**

1. In Classic view, in the iFIX WorkSpace, from the WorkSpace menu, select User Preferences.  
-Or-  
In Ribbon view, on the Home tab, in the WorkSpace group, click Settings, and then click User Preferences.
2. Click the Animations Data Error Defaults tab.
3. Enter the desired numeric value or text string based on the following guidelines:
  - For range conversions, enter a numeric string in the appropriate fields of the Linear Animation Object Defaults area.
  - For format conversions, enter a text string in the appropriate fields of the Format Animation Object Defaults area.
  - For table conversions, enter a numeric or string value in the appropriate Numeric Table Entries or String Table Entries fields, respectively. To assign a color to the new entry, click the corresponding field in the Color Table Entries column and select a color from the Select Color dialog box.

## **Assigning Blinking Thresholds**

► **To assign a blinking threshold:**

1. In the iFIX WorkSpace, select an object.
2. In Classic view, click the appropriate Color Expert on the Experts toolbar, or click the Task Wizard button and select the appropriate Color Expert from the Task Wizard dialog box.  
-Or-  
In Ribbon view, on the Tools tab, in the Tasks/Experts group, click the Tasks/Experts dialog box launcher and select the appropriate Color Expert from the Task Wizard dialog box.
3. In the Data Source field, enter a data source.
4. Select the coloring scheme by selecting the appropriate option in the Color By area.
5. Select the threshold method by selecting the appropriate option in the Color Threshold area.

6. In the New Alarm area, select the Blink on New Alarm check box.
7. Click the Blink on New Alarm Color button and select the blink color from the Select Color dialog box.

## Setting the Blink Speed

► **To set the blink speed:**

1. In the iFIX WorkSpace, double-click the object you want to modify. The Basic Animation dialog box appears.
2. Click Configure. The Advanced Animations dialog box appears.
3. Click the Color tab.
4. Select the Animate check box for the color property you want (ForegroundColor, BackgroundColor, EdgeColor, BackDropColor, BackDropBorderColor, BackDropBackgroundColor, or BackDropFadeColor).
5. Click the Advanced button and, in the Other Options area, enter a blinking rate (in seconds) in the Toggle Rate field.

## Running Your Pictures

Once you have developed your pictures, you are ready to see them go to work for you. All of the development time you put into your design can now be realized with the click of the mouse.

Because the iFIX configuration environment is fully integrated with the iFIX WorkSpace, running your pictures is simply a matter of switching environments. You do not have to start another application or leave your picture. Just click the Switch to Run button on the Standard toolbar (Classic view), or on the Home tab in the WorkSpace group, click Switch to Run (Ribbon view), or press Ctrl+W. This launches you into the run-time environment. The iFIX WorkSpace system tree disables, and the objects in your picture activate. To return to your drawing, select Switch to Configure from the WorkSpace menu (Classic view), or on the Home tab in the WorkSpace group, click Switch to Configure (Ribbon view), or press Ctrl+W again.

When working with your pictures in the run-time environment, you have many of the same iFIX WorkSpace menus available as you did in the configuration environment. The operations you can perform are dependent on two factors: the type of document that you have open, and the access privileges you are allowed. For example, typically operators will employ some degree of environmental protection to implement a secure run-time environment. In this case, some of the iFIX WorkSpace menus may not be available because access to specific functions was not granted. For more information on how to implement this type of security, refer to the [Configuring Security Features](#) manual.

The following sections provide detail on the operations you can perform with your pictures while in the run-time environment. For more information on the run-time environment of the iFIX WorkSpace, refer to the [Understanding iFIX](#) manual.

### Working with Objects in the Run-time Environment

Objects in your pictures can be controlled, selected, or modified based on the properties you have enabled for the objects. These properties are enabled in the configuration environment by selecting the appropriate check box on the Basic Animation dialog box or the General tabbed page of the Advanced Animations dialog box. The following table details the operations you can perform with objects in the run-time environment based on the property you have activated.

#### Object Run-time Attributes

By selecting the <b>check box...</b> You activate the <b>property...</b> Which lets you...		
Enable Tooltips	EnableTooltips	Enable tooltips for the object at run-time. Text for the highlight comes from the Description property.
Enable Highlight	HighlightEnabled	Highlight the object at run-time. When the cursor passes over the object, a single-lined box surrounds the object.
Enable Select	IsSelectable	Select the object at run-time. When you select the object, a double-lined box surrounds the object.

Each of the properties can also be animated so that you can perform more specific actions. For more information on animating object properties, refer to the [Animating Object Properties](#) chapter.

Some objects can be modified at run-time by writing and executing Visual Basic scripts. For more detail on writing scripts to control objects at run-time, refer to the [Writing Scripts](#) manual.

## Interacting with Alarm Summaries at Run Time

While in the run-time environment you can view and test an Alarm Summary object's configuration. For example, you can:

- Acknowledge the currently selected alarm.
- Acknowledge or delete all alarms that match the current filter.
- Change the Alarm Summary object's filter or sort configuration.
- Change and restore the Alarm Summary object's default settings.
- Temporarily disable the alarm refresh rate and instruct the Alarm Summary object to stop updating the spreadsheet.

For more information on working with Alarm Summary objects in the run-time environment, refer to the [Working with the Alarm Summary Object](#) section of the Implementing Alarms and Messages manual.

## Interacting with Charts in Run Time

While in the run-time environment, you can control certain chart properties. Some examples include the following:

- Modifying pen properties using the Chart Customization dialog box.
- Zooming in on an area of the chart.
- Displaying multiple X and Y axes.
- Displaying time cursor tooltips to determine plot values and time stamps.

For more information on working with charts in the run-time environment, refer to the [Working in the Run-time Environment](#) section of the Trending Historical Data manual.

## Locating Objects

The Locate Object Expert lets you search for an object in the current document or any open documents in the iFIX WorkSpace while in the run-time environment. Simply open the Expert and type the object's name in the Object's Name field. You can access this Expert from the Command Category of the Task Wizard.

## Using the Global Time Control

The Global Time Control, which is available on the Historical tab, in the Ribbon view during run mode, allows you to control the display of objects configured with historical data sources. If the data source configured in an object is not historical, that is, it uses a real-time data source, the Global Time Control feature has no effect on it. Using the Global Time Control you can do the following:

- Synchronize the time for all historical data sources to the times displayed in the Start Time and End Time fields (by clicking any of the controls on the Global Time Control). This synchronization applies to all open pictures where GlobalTimeSync is set to true. The parameters in the Global

Time Control do not persist when you exit run mode.

- Set the historical data sources to end at the current time (using the Set to Current Time button)  
**NOTE:** If the historical data source in an object is configured for Current Value mode, the Set to Current button has no effect on it.
- Scroll through the historical data, either forward or backward, quickly or slowly (using the Scroll buttons).
- Playback historical data by a specified speed or frame size.

To use the Global Time Control, the GlobalTimeSync picture property must be set to true. By default, GlobalTimeSync is set to true on all pictures. If the GlobalTimeSync is not set to true, than the Global Time Control and its control buttons has no effect on the open pictures. The GlobalTimeSync property can be accessed via the picture's Property Window.

### Configuring the Global Time Control

To configure the Global Time Control, click Configuration on the Historical tab. This opens the Global Time Control Configuration dialog box. There, you can set the start time and end time for the historical displays, as well as the update and scroll rates. You can also enable playback here, optionally.

Clicking OK applies the parameters set in the Global Time Control to all open pictures.

The Global Time Control is enabled for all pictures, by default. If you do not want operators to be able to configure the Global Time Control, then disable this option, by setting GlobalTimeSync to false, via the Properties window.

### Displaying the Global Time Control

To display the Historical tab, which contains the Global Time Control, you can either:

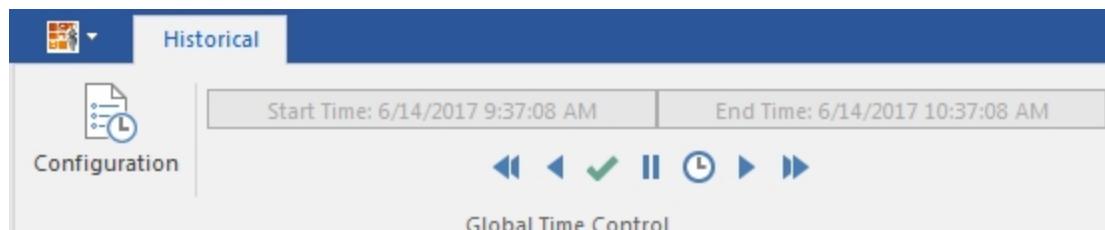
Click the Historical tab, which will cause it to display until you click elsewhere.

-Or-

Clear the Minimize the Ribbon option from the Quick Access Toolbar, which causes the Historical tab to display until you leave run mode.

### Using the Global Time Control

The Global Time Control has several buttons which control the display. They are pictured in the following image and detailed in the following table.



*Global Time Control*

The Global Time Control includes the following buttons:

### Global Time Control Buttons

Button	Description
	Fast Scroll Back. By default, this scroll value is a percentage of the duration (either the Duration you entered directly in the Global Time Control Configuration dialog box, or the duration calculated from the End Time-Start Time in the Global Time Control Configuration dialog box). Otherwise, this scroll value is the number of days, hours, minutes, or seconds as defined in the Global Time Control Configuration dialog box.
	Slow Scroll Back. By default, this scroll value is a percentage of the duration (either the Duration you entered directly in the Global Time Control Configuration dialog box, or the duration calculated from the End Time-Start Time in the Global Time Control Configuration dialog box). Otherwise, this scroll value is the number of days, hours, minutes, or seconds as defined in the Global Time Control Configuration dialog box.
	Apply the settings from the Global Time Control Configuration dialog box to all open, or subsequently opened pictures, that have the GlobalTimeSync picture property set to true.  <b>NOTE:</b> If you have scrolled in your picture, either forward or back, after you click Apply, the time period displayed in the picture is reset to the period specified in the Global Time Control Configuration dialog box; the time to which you scrolled is no longer displayed.
	Pause the Historical Update of objects that have a historical update rate configured. Objects that do not have a historical update rate configured are not affected.  <b>NOTE:</b> Even though a picture is paused, you can still scroll forward or back.
	Set the End Time of the Global Time Control to the Current Time.
	Slow Scroll Forward. By default, this scrolls the time frame as a percentage of the duration (either the Duration you entered directly in the Global Time Control Configuration dialog box, or the duration calculated from the End Time- Start Time in the Global Time Control Configuration dialog box). Otherwise, this scroll value is the number of days, hours, minutes, or seconds as defined in the Global Time Control Configuration dialog box.
	Fast Scroll Forward. By default, this scrolls the time frame as a percentage of the duration (either the Duration you entered directly in the Global Time Control Configuration dialog box, or the duration calculated from the End Time- Start Time in the Global Time Control Configuration dialog box). Otherwise, this scroll value is the number of days, hours, minutes, or seconds as defined in the Global Time Control Configuration dialog box.

**NOTE:** Changes made using the Global Time Control apply to historical data sources in all open pictures which have the GlobalTimeSync property set to true.

The time frame of the data displayed is adjusted to represent the time of your local time zone.

### **Example**

Assume the following settings for the Global Time Control:

- Duration = 1 hour
- End Time = 10:00 a.m.
- Update Rate = 10 minutes
- Slow Scroll Percentage = 10%

Clicking Apply applies these settings to all objects containing historical animations within any open picture that has the Global Time Control enabled.

In this example, with the preceding parameters configured in the Global Time Control, causes the following to occur:

- Historically animated objects display historical values between 9:00 a.m. and 10:00 a.m.
- After 10 minutes, the picture updates, with historical animations displaying values between 9:10 a.m. and 10:10 a.m.
- Clicking Slow Scroll moves the time window for historical animations forward or backward by 6 minutes

### **Limitations**

If you apply a short update rate to pictures that contain a large number of objects with Historical Animations, you may experience performance issues - your objects may not update at the expected rate.

## **Using Experts to Expedite Pictures at Run Time**

iFIX Experts allow you to perform many different functions at run-time, and several of the Experts provide a check box that let you specify a function in the run-time environment. The following table details the Experts that you can use in the configuration environment that let you specify run-time functionality.

**NOTE:** When using the Use Database Tag(s) for Item(s) Selected in Run Environment option in the experts, make sure that the object is highlightable, but not selectable. If the object is selectable when the script is fired, the script looks at that object for a data source and fails when it cannot find one.

### **Performing Operations at Run Time Using Experts**

To...	Select the check box...	On the Expert...
Open a picture	Select picture to open in Run Environment	Open Picture
Close a picture	Close Current Picture in Run Environment	Close Picture
Replace a picture	Replace Current Picture in Run Environment	Replace Picture
Open a digital tag	Use Database Tag(s) for Item(s) Selected in Run Environment	Open Digital Tag
Close a digital tag	Use Database Tag(s) for Item(s) Selected in Run Environment	Close Digital Tag
Toggle a digital tag	Use Database Tag(s) for Item(s) Selected in Run Environment	Toggle Digital Tag
Write a value to a tag	Use Database Tag(s) for Item(s) Selected in Run Environment	Write Value to Tag
Ramp a value to a tag	Use Database Tag(s) for Item(s) Selected in Run Environment	Ramp Value to

	Run Environment	Tag
Turn a tag on scan	Use Database Tag(s) for Item(s) Selected in Run Environment	Turn Tag On Scan
Turn a tag off scan	Use Database Tag(s) for Item(s) Selected in Run Environment	Turn Tag Off Scan
Set a tag to automatic mode	Use Database Tag(s) for Item(s) Selected in Run Environment	Set Tag Auto
Set a tag to manual mode	Use Database Tag(s) for Item(s) Selected in Run Environment	Set Tag Manual
Toggle a tag between automatic and manual mode	Use Database Tag(s) for Item(s) Selected in Run Environment	Toggle Tag Auto/Manual
Enable an alarm	Use Database Tag(s) for Item(s) Selected in Run Environment	Enable Alarm
Disable an alarm	Use Database Tag(s) for Item(s) Selected in Run Environment	Disable Alarm
Acknowledge an alarm	Use Database Tag(s) for Item(s) Selected in Run Environment	Acknowledge Alarm
Acknowledge all alarms	Acknowledge All Alarms for Current Picture in Run Environment	Acknowledge All Alarms

For more information on alarm acknowledgment, refer to the [Implementing Alarms and Messages](#) manual.

## Multiple Picture Instances and Run Mode

At run-time in the iFIX WorkSpace, you can open multiple instances of a single picture. This action is common for iFIX picture displays in multiple monitor configurations. After opening the picture, you can replace it even if another instance is already open in the WorkSpace, or choose to close all open instances of the picture.

The following table lists the automation interfaces available for working with multiple picture instances.

iFIX Automation Interface	Description
<a href="#">OpenPicture Subroutine</a>	Opens the specified picture. Can be configured to open multiple instances of a specified picture.
<a href="#">OpenTGDPicture Subroutine</a>	Opens a picture with the specified tag group file. Can be configured to open multiple instances of a picture with different tag group files.
<a href="#">ReplacePicture Subroutine</a>	Closes a picture and replaces it with another picture. If the picture you select is already open in the WorkSpace, another instance of that picture opens.
<a href="#">ClosePicture Subroutine</a>	Closes the specified picture. If there are multiple instances of a picture open, all instances of that picture are closed. If a different alias is assigned to each instance, you can close one instance using an alias.
<a href="#">Open_QT_Pic_Ex Method</a>	Opens a Quick Trend Picture for the selected object(s) with a set of pens based on the first eight (8) valid tags. Can be configured to open multiple instances of a Quick Trend Picture.
<a href="#">Open_TCP_Pic_Ex Method</a>	Opens a Tag Control Panel Picture that displays up to 20 of the valid tags associated with the currently selected object. Can be configured to open multiple

	instances of a Tag Control Panel Picture.
<a href="#">Open_TS_Pic</a> <a href="#">Type_Ex Method</a>	Specifies the type of Tag Status picture to open. Can be configured to open multiple instances of a Tag Status Picture.
<a href="#">Open_TS_Pic</a> <a href="#">Ex Method</a>	Opens the Tag Status Picture for first found tag for the selected object(s). Can be configured to open multiple instances of a Tag Status Picture.

Additionally, the following experts allow you to work with multiple picture instances:

- [Open Picture Expert](#)
- [Replace Picture Expert](#)
- [Close Picture Expert](#)

### Important Information About Run Mode

In run mode, you can modify the VBA scripting in a new instance of a picture. However, modifications to scripts in an individual instance of a picture will not be saved. Saving changes to scripts in run mode is not allowed. To make changes to a script in the main picture, switch to configure mode and edit the script in the main picture (not the instance). Alternatively, you can edit the VBA script in the main picture (not the instances) in run mode using the steps below.

► **To edit a VBA script of a picture with multiple instances open in run mode:**

1. In Classic view, in the iFIX WorkSpace, from the WorkSpace menu, select Visual Basic Editor.  
-Or-
2. In the Project tree display, browse to the project you want to edit the script of. Be sure to select the project with the asterisk (\*) next to it. For multiple instances, the asterisk indicates which instance is one you can save changes to. Changes to projects with the same name, but without the asterisk, will not be maintained when you switch back to configure mode.
3. In the Project tree, in your selected project, right-click the object you want to edit and select View Code. The code will appear in the main editing window.
4. On the Run menu, select Design Mode.
5. Make your VBA script changes.
6. On the Run menu, select Exit Design Mode.
7. Close the VBA Editor.

Now, when you go back to configure mode, you will be able to save your changes.

## Using Tag Status and Quick Trend Pictures

The iFIX WorkSpace run-time environment provides you with three pre-configured picture types that you can access to view tag information and trends for the currently selected object(s), including alarm summary objects. These pictures display real-time information about the tags.

These pictures include:

- [Tag Status \(\\*\\_TS.grf\)](#)
- [Quick Trend \(QuickTrend.grf\)](#)
- [Tag Control Panel \(TagControlPanel.grf\)](#)

You can access these pictures when the WorkSpace is in run mode.

**IMPORTANT:** If you create a new iFIX project in the SCU, the TagStatus subdirectory (located in the PIC directory) is not copied to the new project path. You must copy the TagStatus folder to the new PIC directory. For more information about creating new projects, refer to the topic [Create a Project for Each User Type](#).

In addition to these pictures, if you select an object (or objects) with one or more associated tags, the title bar of the iFIX picture displays the tag name of the first tag it finds when the picture opens in run mode.

If you have a single database tag associated with an object, the picture's title bar displays the name of that tag when that object is selected. The following diagram indicates a single associated database tag.



Where:

**circles.grf** - is the name of the picture the object is a part of.

**FIX32.THISNODE** - is the name of the name of the SCADA server (where FIX32 is the data system name, and THISNODE is the alias for the local node name).

**ai1** - is the tag name.

**f\_cv** - is the field name whose data is being accessed.

If there are multiple database tags associated with an object, the picture's title bar displays the name of the first tag it finds, as well as a plus (+) sign to indicate that there are more associated tags. The following diagram shows a plus sign after the tag name to indicate multiple associated tags.



Open a Tag Control Panel picture to view a list of the tags associated with the selected object(s).

### NOTES:

- An object's `IsSelectable` property must be set to True so you can select it in the run-time environment, and the object must be selected to display the tag information in the title bar.
- If you clear the Title bar check box in the Edit Pictures dialog box for the current picture, the title bar, including the picture and tag name information, will not be displayed in the run-time environment. This

is also true for all new pictures, when the Title Bar check box is cleared on the Picture Preferences tab on the User Preferences dialog box.

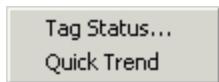
## Accessing Tag Status, Quick Trend, and Tag Control Panel Pictures

Tag Status, Quick Trend, and Tag Control Panel pictures are available only when the WorkSpace is in run mode. If a selected object has one or more associated tags, you can right-click the object and choose the picture type from the menu. You can also select multiple objects and right-click to choose the picture type, as well.

### NOTES:

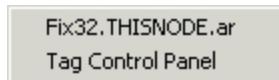
- In order to use the Tag Status features, an object must be selectable in the run-time environment. For information about making an object selectable, refer to [Animating an Object's Properties](#).
- You do not have to group objects in configuration mode to access tag status right-click features in run mode. Simply select multiple objects in run mode prior to accessing the right-click menu.

The following figure shows the right-click menu that appears if at least one tag is associated with the selected object(s). If only one tag is associated and you choose Quick Trend, the Quick Trend picture for that tag appears. If there is more than one associated tag, the Quick Trend picture displays a different pen for each valid tag.



*Right-click Menu*

If only one tag is associated and you choose Tag Status, the Tag Status picture for that tag appears. If an object (or objects) has more than one associated tag, then initially, the above right-click menu appears. When you choose Tag Status, however, a right-click menu like the following one appears.



*Right-click Menu Expanded*

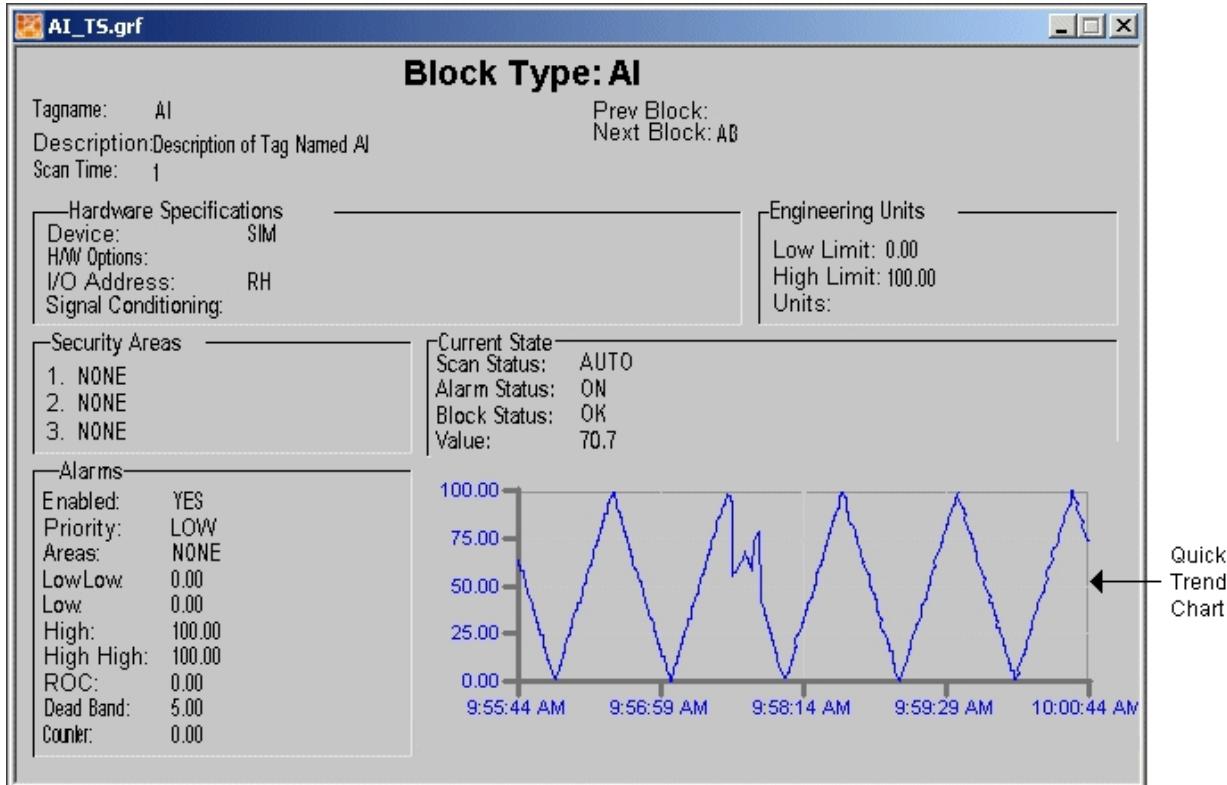
This right-click menu allows you to choose the first tag found (in this example, Fix32.THISNODE.ar) or you can choose Tag Control Panel, which will open the Tag Control Panel picture for this object (or group of objects).

**IMPORTANT:** If the VBA Add-on utility has been installed on your machine, and it is configured to use the RMouseClick Event, the above right-click menus will **not** be available and you will not be able to access tag status functionality. Only the VBA utility right-click menu will be available. It is recommended, however, that you use the Tag Status features because iFIX 4.0 and greater does not support the VBA Add-on utility.

## The Tag Status Picture

Tag status pictures are a set of pre-defined pictures that display information for the selected database tag. One database tag status picture exists for each iFIX database tag type (for instance, AI, AO, DI, DO, and so on).

The following diagram illustrates what a typical Tag Status picture looks like for an AI database tag type. All database tags types have their own Tag Status picture and contain similar information.



*Tag Status Picture for an AI Database Tag Type*

Some tags (that is, database blocks) are designed to work in chains while others are designed to operate on their own. Tags that can work in chains display the fields *Prev Block* and *Next Block* in the Tag Status picture. If the tags associated with the selected object are configured to work in a chain, the next and/or previous tag in the chain is displayed in the appropriate fields. You can click these fields to move through the chain and view the data for the associated tags.

Each Tag Status picture contains a real-time trending chart for the selected database tag. The trending charts are set up to display a 5-minute duration with a 1-second update rate, to a total of 300 viewable points on the chart. You can enlarge the trending chart by first selecting it then right-clicking and choosing Quick Trend from the menu. This view of the Quick Trend chart displays only the pen for the selected tag, even if multiple tags are associated with the object.

### Quick Trend Charts in Tag Status Pictures

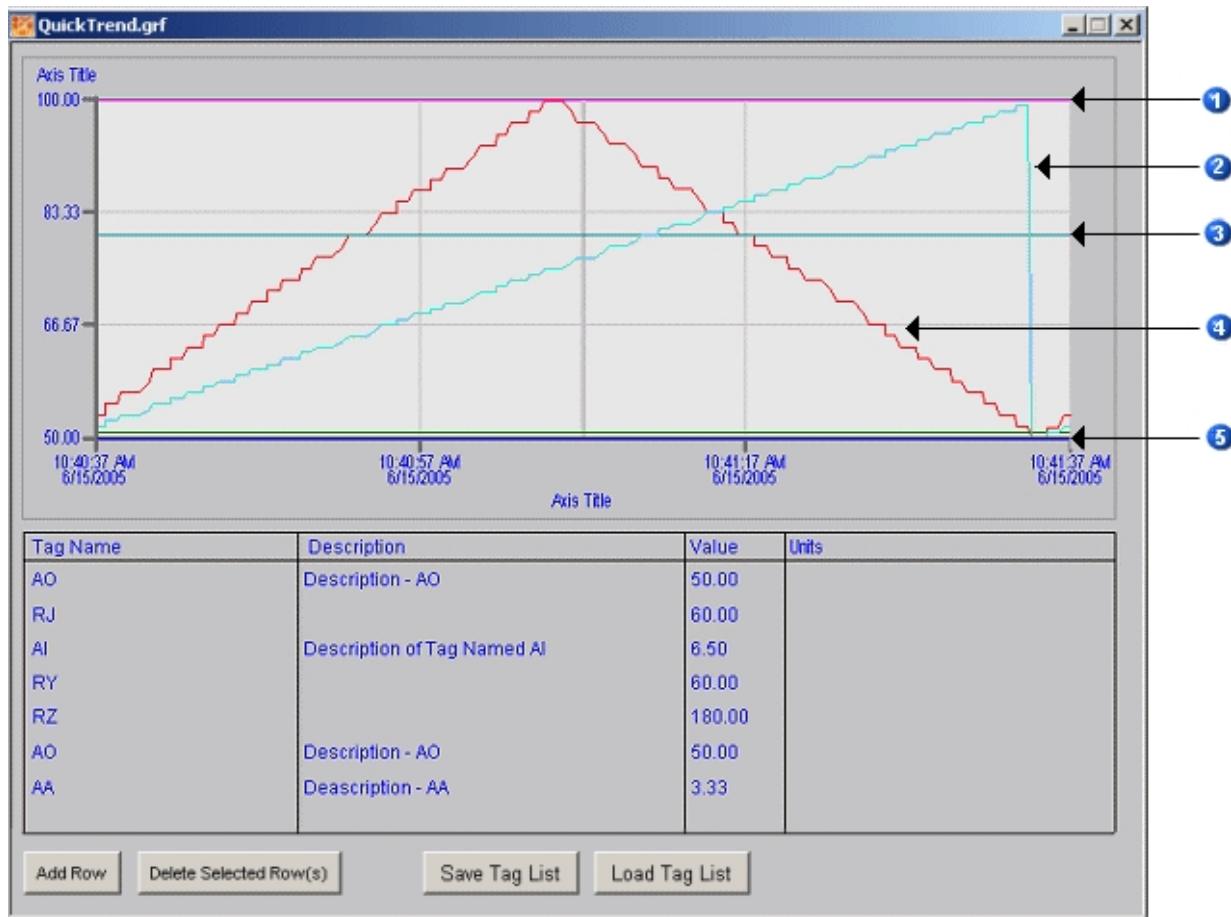
When a Tag Status picture includes a small Quick Trend chart, you can select this Quick Trend picture and then right-click it and choose Quick Trend to display an enlarged version for the associated tag. However, not all tags display a Quick Trend picture or a Quick Trend chart within a Tag Status picture. Only those tags with an associated F\_CV field can display a Quick Trend chart. The following table lists the tags that do not have F\_CV fields:

**Table Caption Outside Table: Tags That Do not Have Quick Trend Chart Capability**

Acronym	Description
BB	On-Off Control
DC	Device Control
EV	Event Action
FN	Fanout
HS	Histogram
PA	Pareto
PG	Program
SQD	SQL Data
TX	Text

## The Quick Trend Picture

The Quick Trend picture provides you with real-time trending information for up to eight (8) database tags associated with the selected object(s). The following diagram shows a Quick Trend picture with 5 pens displaying the data for the associated tags. All of the tags associated with the objects are listed and update the current value of the tag for the current time. The current time is the time displayed at the right edge of the x-axis.



#### *Quick Trend Picture Displaying 5 Pens*

In this case, there are two AO tags with the same value. These are displayed as a single pen.

For information about Quick Trend charts that appear in Tag Status pictures, refer to [Quick Trend Charts in Tag Status Pictures](#).

### **The Tag Control Panel Picture**

The Tag Control Panel picture is available from the right-click menu when there are multiple tags associated with the selected object(s). This picture lets you view the tag names and types, tag values, the last scan times, units of measure, and alarm information related to each tag associated with the selected object(s).

From the Tag Control Panel picture you can also access the Tag Status or Quick Trend pictures associated with the selected tags. However, if the tag does not have an F\_CV field associated with it, a Quick Trend chart will not be available. For information on tags that can display a Quick Trend chart, refer to the section [Quick Trend Charts in Tag Status Pictures](#).

Tag	Quick	Status	Trend	Tag Name	▼▲	▼▲	Tag Type	Value	Last Scan	Unit	Description	Current Alarm	Last Alarm Time
<input type="checkbox"/>	<input type="checkbox"/>			AO			AO	50.00	50.00		Description - AO	OFF	6/15/2005 9:48:34 AM
<input type="checkbox"/>	<input type="checkbox"/>			RJ			AO	60.00	6/15/2005			OFF	6/15/2005 9:48:
<input type="checkbox"/>	<input type="checkbox"/>			AI			AI	80.53	6/15/2005		Description of Tag N	OK	6/15/2005 9:48:
<input type="checkbox"/>	<input type="checkbox"/>			RY			AO	60.00	6/15/2005			OFF	6/15/2005 9:48:
<input type="checkbox"/>	<input type="checkbox"/>			RZ			AO	180.00	6/15/2005			OFF	6/15/2005 9:48:

*Tag Control Panel Picture Displaying 5 Tags*

### Adding and Deleting Tags

In addition, you can add tags to view their information and the Tag Status and Quick Trend pictures, or you can delete tags from the list. Adding tags to, or deleting tags from the Tag Control Panel, does not affect their existence in regard to the selected object(s). Adding and deleting tags are temporary operations; that is, adding a tag in this picture does not add it to the selected object and deleting a tag, even if it is already associated with the object, does not delete it from the object.

For example, if the Tag Control Panel picture is full, but you want to view the Quick Trend picture for another tag, you can delete a tag and add the tag with the information you want to access. The next time you open this Tag Control Picture the proper tags will be listed; that is, tags you deleted will be visible again and tags you added will not exist.

### Saving and Loading Tag Lists

You can save a tag list that you manually created by using the Save Tag List button. When you have created the list of tags you want, click the Save Tag List button and save the list to the desired location. When you want to view a saved tag list, click the Load Tag List button and select the tag list you want to view. Saving and loading tag lists does not affect the tags that are displayed for the selected object(s).

## Translating Picture Text

The iFIX WorkSpace provides you with the ability to set and change the language of a picture as it opens in run mode. As the picture opens, the WorkSpace reads a target language file and substitutes the picture's text strings with the translated strings. However, it does not do the translations for you; you must provide the translated text strings yourself.

Translating text is limited to replacing text captions, button captions, object descriptions, the Alarm Summary object, and certain properties in charts. You cannot switch the language for overall system text such as dialog box titles, menus, error strings, and so on.

### IMPORTANT:

- If you change the regional settings in Windows, you must restart iFIX and your computer after you make your changes.
- If iFIX is running on a computer under English regional settings (or regional settings for another western language such as French or German), you can only display translated text strings for western languages (for example: English, French, and German) in your pictures.
- In order to display translated text for non-western languages (such as Chinese, Japanese, Russian, or Polish), regional settings must be configured for the specified language that you want to display. To change the regional settings, be sure that you select the correct language (for example, Chinese, Japanese, Russian, or Polish) in all of the applicable drop-down lists from the Control Panel's Regional and Language Options dialog box: in the "Standards and Formats," "Location," and "Languages for non-Unicode programs" fields (the "Languages for non-Unicode programs" field is located on the Advanced tab). For double-byte languages such as Japanese or Chinese, you additionally need a Japanese or Chinese operating system; more specific details for working with double-byte languages are outlined in some of the bullets below.
- You cannot switch translations between multiple non-western languages (such as Chinese, Japanese, Russian, or Polish) without changing the regional settings. For example, you cannot switch on-the-fly between Chinese and Japanese, or Chinese and Russian.
- If you want to display both Japanese and English (or Japanese and another western language such as French or German), you must set the regional settings to Japanese. You cannot display other non-western languages, such as Chinese or Russian, in your pictures; you can only display Japanese and western languages (for example: English, French, and German).
- If you want to display both Chinese and English (or Chinese and another western language such as French or German), you must set the regional settings to Chinese. You cannot display other non-western languages, such as Japanese or Russian, in your pictures; you can only display Chinese and western languages (for example: English, French, and German).
- If you are using double-byte languages, (for example, Chinese or Japanese), you must be running iFIX on a computer with a native operating system (for example: a Chinese or Japanese operating system) and have the appropriate regional settings configured. On the Advanced tab of the Regional and Language Options dialog on Control Panel, do not forget to configure the Languages for non-Unicode programs field with the target language. You must also make sure that you set the applicable font on the Shape Preferences tab on the User Preferences dialog box.
- If the translated text for a single-byte language displays as a series of ????, you must configure the Languages for non-Unicode programs field with the target language and select the applicable font. However, you do not require a native operating system for single-byte languages.
- For pictures created in iFIX 4.0 that include Alarm Summary objects, you need to export your language file again, so that the Alarm Summary information is included. The Alarm Summary object originally was not included in iFIX 4.0 language translation files.

- It is recommended that you only use either global picture translation or individual picture-level translation in your pictures. If you mix both settings, your users could get undesirable results when opening pictures in different languages.
- Use caution when using this feature with iFIX WebSpace. It is recommended that you set the language at the individual picture-level in the iFIX WorkSpace, instead of using the global configuration. That way, you can ensure that only certain pictures open in a specified language (and not the same language settings for all users and all pictures). For an example of the picture-level settings and how you might want to use them with the iFIX WebSpace, refer to the second example in the [Examples of How to Switch Between Languages](#) section.
- The iFIX WebSpace Server should match the regional settings and native operating system language of the iFIX SCADA Server.

This feature is very useful if you develop your picture(s) in one language (in configure mode), but want to provide the text in a different language for operators viewing the picture (in run mode). Using this feature, you can have the same picture available in multiple languages.

This feature is also useful for changing the language of the text that appears in a picture in configure mode. You can export text strings, translate them, and import the translated text back into your original picture so that your picture's default text strings now appear in the translated language in configure mode. For instance, use this feature if you want to translate the text for the Tag Status, Quick Trend, and Tag Control Panel pictures. For more information on these picture types, see [Using Tag Status and Quick Trend Pictures](#).

#### **NOTES:**

- Only the iFIX WorkSpace supports changing the language of the displayed picture text.
- Font colors are not available for translations.

The Translation Toolbar is available to support these features. This toolbar allows you to export or import all of the text from a picture into a language specific .CSV file. You can then add translations and font requirements to these .CSV files to use when you open the corresponding pictures. For more information about the Translations Toolbar, refer to [Manipulating Objects Using Toolbars](#). For more information on how to use the toolbar to export or import a .CSV file, see [Exporting and Importing Language Files](#).

**IMPORTANT:** If list separator is comma in your local regional settings, you can use Microsoft Excel to edit your .CSV files. Otherwise, it is recommended that you use Notepad to edit your .CSV files. It is important that you use the proper text editor, so that the list separator, a comma, gets saved properly using your operating system's native regional settings. If you are unsure of your settings, use Notepad to edit your .CSV files.

## **Global Picture Language Settings**

Global picture language settings are used when opening pictures in run mode. However, you must create language files for your pictures and translate the text strings for this feature to work. For example, you develop the configure mode pictures in your native language of French so that you can update and troubleshoot them. But, the operators want to display all run mode pictures in German. A German language file with translated text must exist for each picture you want the operators to view in German from the WorkSpace run mode. If no language file exists, the default language (in this case French) appears.

When you change the language in run mode using the global language setting, all pictures that you open from that point on will open in the specified language, as long as there is a language file for that language. If you change the global language setting, pictures that are opened from that point forward open in the new language, but previously opened pictures do not change to the new language. You must close

and reopen those pictures for the new language to take effect. The language changes only when opening the picture in run mode.

**NOTE:** If a language file does not exist, the picture text appears in the picture's default language; that is, the language in which it was created.

### User Preference for Global Language Settings

To configure the global picture language settings, select the Translate Picture on Open check box on the Picture Preferences tab of the User Preferences dialog box. When you select this check box, the Language list is enabled and you can choose the language that you want the text strings to appear in when the picture opens in run mode. You can also use the SetLanguage global subroutine in VBA.

**TIP:** While in the User Preferences dialog box, you may also want to confirm that the applicable font is set on the Shape Preferences tab and change it, if necessary.

**NOTE:** When the Translate Picture on Open check box is selected, the TranslateOnOpen and LanguageDesired properties in the Properties window for individual pictures cannot be changed.

### Individual Picture Language Settings

Individual picture language settings are also used when opening pictures in run mode; however, you can change the displayed language for a single picture rather than all pictures. As with global picture language settings, you must create language files for your pictures and translate the text strings for this feature to work.

For example, you have pictures that only administrators look at and these pictures are displayed in French in run mode. You have another group of pictures that only operators look at and you want to display these pictures in Spanish when in run mode. All of the pictures were developed in English, in configure mode. In this case, each picture can have specific language settings. French and Spanish language files with translated text must exist for the appropriate pictures the administrators and operators will view in run mode.

### TranslateOnOpen and LanguageDesired Properties in Individual Pictures

To configure the language settings at the picture level, use the [TranslateOnOpen](#) and [LanguageDesired](#) properties on the active picture. You can access these properties on the Properties window in the iFIX WorkSpace or from a VBA script while in configure mode. Be aware that in order to set these properties, the Translate Picture On Open check box on the Picture Preferences tab of the User Preferences dialog box must be cleared. If this check box is not cleared, the global picture language settings override the individual picture settings.

You can also use [SwitchLanguage](#) to change the language programmatically in VBA.

**NOTE:** When you use the individual picture language settings, opening a picture in run mode for the first time is slower than it would normally take without caching enabled. If you enable picture caching, after the picture has been opened and cached, the next time you open it in run mode there is no delay. For more information about picture caching, refer to [Using Picture Caching](#).

## Language File Exporter Dialog Box

The Language File Exporter dialog box allows you to export separate language files that you want to translate for each selected picture.

### **Export location**

Specifies the folder that the language files are exported to. The language files are exported to the PIC folder of your iFIX installation location. Language files for Tag Status, Quick Trend, and Tag Control Panel pictures are exported to the TagStatus subfolder of the main PIC folder.

### **Select Pictures**

Lists all of the pictures in the PIC folder or in the TagStatus subfolder of the main PIC folder.

### **Show Tag Status Pictures Check Box**

Select this check box to display the Tag Status pictures in the Select pictures list. The Export location folder changes to display the Tag Status folder location.

### **Always overwrite existing export files Check Box**

Select this check box if you want any previously existing language files for the selected picture(s) to be automatically overwritten. Clear this check box to be prompted to replace existing language files.

### **Select Language**

Specifies the language you want to use for naming the language file.

### **Select All**

Click this button to select all of the pictures in the list.

### **Deselect All**

Click this button to clear your selections from the list.

### **Export**

Click this button to perform the language files export.

### **Exit**

Click this button to close the Language File Exporter dialog box without saving any of your changes.

## **Exporting and Importing Language Files**

Language files are Comma Separated Value (.csv) files that can be edited in Notepad. If list separator is comma in your local regional settings, you can use Microsoft Excel to edit your .CSV files. Otherwise, it is recommended that you use Notepad to edit your .CSV files. It is important that you use the proper text editor, so that the list separator, a comma, gets saved properly using your operating system's native regional settings. If you are unsure of your settings, use Notepad to edit your .CSV files.

These .CSV files reside in the same location that your pictures are found in, which by default, is the PIC folder of your iFIX installation location, or in the TagStatus subfolder of the main PIC folder. Exported language files are saved in the following format:

*PictureName\_LangLetter.csv*

where:

*PictureName* is the name of the picture whose language file you are exporting, and

*LangLetter* is the acronym for the language the picture is being translated into.

For example, if the picture name is Circles and you select German for the language, the exported language file name will be Circles\_DE.csv. For more information on the available language letters, see the section [Language Letter Acronyms](#).

iFIX WorkSpace provides a Translation Toolbar that allows you to:

- Export a single language file for each picture.
- Export language files for multiple or single pictures.
- Import a language file.

After you export a language file, open it in Notepad or Microsoft Excel and translate the appropriate text strings. If the global or picture level language setting is configured for the same language you translated the text strings into, the iFIX WorkSpace reads the translated .CSV file when the picture opens in run mode and displays the text strings in the translated language.

If you exported more than one language file for a single picture, the target language file is the file with the language that matches the LanguageDesired property defined for the individual picture. For example, if you exported language files in Spanish, Italian, and French for the picture Circles.grf , and the LanguageDesired property is set to Spanish, the picture's text is displayed in Spanish in run mode. To view the translated text in Italian or French, you must close the picture, change the LanguageDesired property to the appropriate language, and then reopen the picture in run mode.

Every time you export a language file, a log file is also created. These log files are created for each picture that you export a language file for, even if you are exporting language files for multiple pictures. For example, you have 20 pictures in your PIC folder and you use the Language File Exporter dialog box to export German language files for all 20 pictures. iFIX creates a separate log file for each language file with the format:

*PictureName\_LangLetterExport.log*

The log files will be named Circles1\_DEExport.log, Circles2\_DEExport.log, and so on.

## Exporting a Single Language File

You can export a language file for the currently active picture. The language selected in the LanguageDesired property determines the language letter acronym used in the language file name. If you have a global language set for all pictures, you cannot change the LanguageDesired property. In order to change the language setting at the picture level, you must clear the Translate Picture On Open check box on the Picture Preferences tab of the User Preferences dialog box. For more information, see [Individual Picture Language Settings](#).

## Exporting Multiple Language Files

You can choose to export language files for multiple pictures. Use the Language File Exporter dialog box to select the pictures and language you want to create language files for. A separate language file for each of the selected pictures is exported. Each file name uses the same language letter acronym. For more detailed information, see [Language File Exporter Dialog Box](#).

You can also choose to create a language file for a single picture without having to change the defined language setting, whether it is at the global or the picture level. For example, the global language setting is defined for French and you have already created French language files for your 20 pictures, Circles1.grf through Circles20.grf. You now want your Polish operators to view Circles10.grf in their native language in run mode. Use the Language File Exporter dialog box to export a Polish language file for Circles1.grf. The operators can then set the LanguageDesired property for Circles10.grf to Polish before opening it in run mode.

**NOTE:** In order to set the LanguageDesired property, the Translate Picture On Open check box on the Picture Preferences tab of the User Preferences dialog box must be cleared. If this check box is not cleared you cannot define individual picture language settings.

## Importing a Language File

After a CSV language file has been exported and translated, you have the option to import that CSV file back into the corresponding picture while it is open in configuration mode. This allows you to change the text translations in the original, source picture - so that the translated text is saved along with the picture (and not just temporarily displayed in run mode). The translated text replaces the original text strings in the original picture.

**IMPORTANT:** The language selected in the LanguageDesired property must match the language letter acronym in the language file name in order for the language file to be imported properly.

**NOTE:** Be aware that if you only want to switch languages in run mode, you do no need to import any translations. Importing translations is an [option](#) available if you want to update the original pictures with translated text, so that the translations replace the original text in configure mode.

If you have a global language set for all pictures, you cannot change the LanguageDesired property. In order to change the language setting at the picture level, you must clear the Translate Picture On Open check box on the Picture Preferences tab of the User Preferences dialog box.

Importing a language file is useful if you want to save the picture with the translated text strings. For example, you have a French version of iFIX and want to replace the text strings in the Tag Status and Quick Trend pictures with French strings and only view these pictures in French. After the translation is complete and you have imported the language file(s), save the pictures with the new text strings. In this

case, both configure and run mode pictures will appear in the translated language. There is no need to change language files in run mode.

## Language Letter Acronyms

Country Acronyms for Language Files		
LCID	LangLetter	Language
1027	CA	Catalan
1029	CS	Czech
1030	DA	Danish
1031	DE	German
1032	EL	Greek
9	EN	English
1034	ES	Spanish
1035	FI	Finnish
1038	HU	Hungarian
1040	IT	Italian
1041	JA	Japanese
1042	KO	Korean
1043	NL	Dutch
1044	NO	Norwegian
1045	PL	Polish
1049	RU	Russian
3098	SR	Cyrillic
1050	HR	Croatian
1051	SK	Slovak
1053	SV	Swedish
1054	TH	Thai
1055	TR	Turkish
1057	IN	Indonesian
1060	SL	Slovenian
1069	EU	Basque
1028	ZHTW	Chinese - Taiwan
1036	FR	French
1046	PTBR	Brazilian Portuguese
2070	PT	Portuguese
2052	ZHCN	Chinese PRC
3084	FRCA	French Canadian

## Examples of How to Switch Between Languages

The following examples show you how to use VBA scripting that allows you to change the displayed language in your pictures when they are opened in run mode.

[Example 1](#) shows you how to set the script at the global level (with `SetLanguage`). That is, all pictures that have an exported language file for the set language will display the text in that language when opened in run mode.

[Example 2](#) shows you how to set the script to open a specific picture in run mode (with `TranslateOnOpen`, `LanguageDesired`, and `SwitchLanguage`) and display the text in the desired language.

[Example 3](#) shows you how to switch the language for a single open picture, dynamically in run mode (with `SwitchLanguage`).

**TIP:** If you want to re-use these examples be sure that you review the important items listed on the [Translating Picture Text](#) topic before doing so, to ensure your configuration is correct.

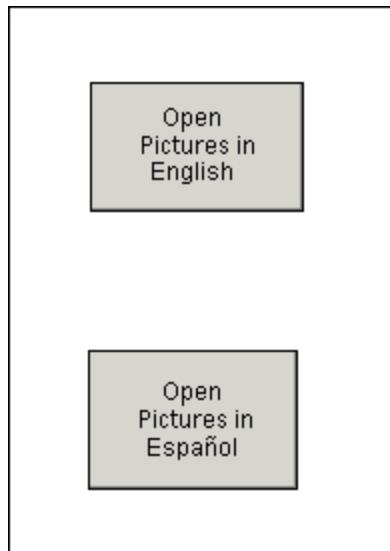
### Example 1: Configure Global Language for all Pictures to Open in Run Mode

The following example shows you how to create a picture that allows you to globally switch between languages while in run mode, in this case English and Spanish. After you switch the language the first time, any picture you open from that point onward displays in the specified language, provided a language file exists. You must close the picture and click another language button to switch the language again. With this example, you must manually open and close your pictures in run mode.

**NOTE:** This example assumes that English is the default language that the pictures are created in.

**IMPORTANT:** If you are using the iFIX WebSpace, it is recommended that you configure the language settings at the individual picture-level. If you instead configure them globally using this example, you will reset the language across all pictures for all users. This may be undesirable for your web users. For steps on picture-level configuration, refer to the second example below.

1. In the iFIX WorkSpace configure mode, open the User Preferences and click the Picture Preferences tab.
2. In the Cache area, clear the Enable Picture Caching check box if is enabled. This check box must be disabled if you want to re-open the *same* picture in the new language, after changing the languages.
3. In the Picture Translation area, select the Translate Picture on Open check box, and in the Language drop-down list select Default.
4. Create a new picture with two push buttons labeled "Open Pictures in English" and "Open Pictures in Español", as in the following picture.



*Language Buttons*

5. In configure mode, right-click the Open Pictures in English push button and choose Edit Script. The Visual Basic Editor appears.
6. Enter the following script to set the global language:

```
SetLanguage LANG_English
```
7. Repeat steps 5 and 6, with the Open Pictures in Español button, but replace the `SetLanguage LANG_English` line with `SetLanguage LANG_Spanish`.
8. Close the Visual Basic Editor and save the picture with a unique name.
9. Add some English text to the picture, and save the picture.
10. Export Spanish language files for the pictures that have text you want displayed in Spanish. For steps, refer to the [Exporting Multiple Language Files](#) section.
11. In Notepad, open the Spanish language CSV file for the picture that you generated in the previous step, and provide translations for the picture text. For steps, refer to the [Editing a Language File](#) section.
12. Switch to run mode.
13. Click the Open Pictures in Español button. Any picture that you open after clicking this button will display the English picture text in Spanish, if the picture has a Spanish CSV file.  
**NOTE:** To display Spanish text for pictures that were opened before clicking the button, close and re-open them. For example, if you close the picture we created in these steps and then re-open it, the text displays in Spanish.
14. To switch back to English, close any open pictures except the push button picture with the language settings.
15. Click the Open Pictures in English button and then reopen each picture. The text displays in English.

**NOTES:**

- Only one instance of a picture can be open at a time; you must close a picture before opening it to display the text in a different language.
- If a picture does not have a language file for the language you are displaying in, the text will remain in the default language in which it was created.
- You can create as many push buttons as you want to switch between multiple languages.

## Example 2: Open a Single Picture in a Desired Language in Run Mode

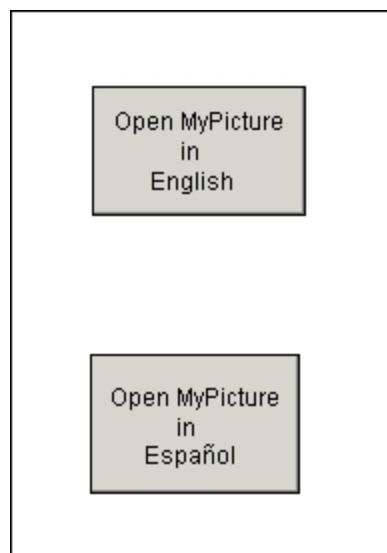
The following example shows you how to create a picture with push buttons that allow you to open another picture in run mode and display its text in the desired language; in this case English and Spanish. In this example, only the picture, *MyPicture*, will open when either of the buttons is clicked and you can easily switch between English and Spanish. The OpenPicture command will open multiple instances of the same picture, so that you can have more than one language version of a picture open at the same time.

**NOTE:** This example assumes that English is the default language that the pictures are created in.

**IMPORTANT:** If you are using the iFIX WebSpace to open a picture, be aware that other pictures already open do not change languages when you open a picture. The language changes only when you open the picture.

**TIP:** If you want to re-use this example be sure that you review the important items listed on the [Translating Picture Text](#) topic before doing so.

1. Create a picture with text and name it *MyPicture.grf*.
2. Add two push buttons labeled "Open MyPicture in English" and "Open MyPicture in Español", as in the following picture.



*Language Buttons*

3. In configure mode, right-click the Open MyPicture in English push button and choose Edit Script. The Visual Basic Editor appears.
4. Enter the following script to set the TranslateOnOpen, LanguageDesired, and SwitchLanguage:

```
Dim pic As Object
OpenPicture "MyPicture.grf", , , , , , True
```

```

Set pic = Application.ActiveDocument.Page
pic.Translateonopen = False
pic.LanguageDesired = 9
pic.SwitchLanguage

```

5. Repeat steps 3 and 4, with the Open MyPicture in Español button, but replace the `pic.LanguageDesired = 9` line with `pic.LanguageDesired = 1034` (1034 is the enumeration that represents Spanish, where as 9 represents English).

**NOTE:** For a listing of the enumerations for all supported languages (also called LCIDs) refer to the [Language Letter Acronyms table in the Exporting and Importing Language Files topic](#).

6. Close the Visual Basic Editor and save the picture with a unique name.
7. Add some English text to the picture, and save the picture.
8. Export a Spanish language file for *MyPicture.grf*.
9. Open the language file in Notepad and translate the picture text to Spanish. For steps, refer to the [Editing a Language File section](#).

**NOTE:** If list separator is comma in your local regional settings, you can use Microsoft Excel to edit your .CSV files. Otherwise, it is recommended that you use Notepad to edit your .CSV files. It is important that you use the proper text editor, so that the list separator, a comma, gets saved properly using your operating system's native regional settings. If you are unsure of your settings, use Notepad to edit your .CSV files.

10. Make sure the Translate Picture on Open check box on the Picture Preferences tab of the User Preferences dialog box is cleared.
11. Switch to run mode and open the picture with the push buttons.
12. Click the Open MyPicture in Español button. *MyPicture.grf* opens with the text displayed in Spanish.
13. From the Window menu, choose Tile Vertical to view both pictures.
14. Click the Open MyPicture in English button. The text in *MyPicture.grf* displays in English.

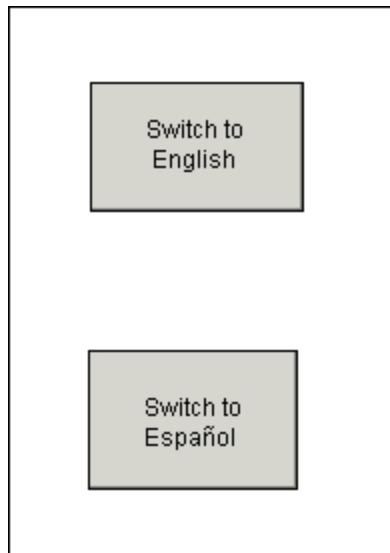
#### NOTES:

- If a picture does not have a language file for the language you are displaying in, the text will remain in the default language in which it was created.
- You can create as many push buttons as you want to switch between multiple languages. Be sure that you review the important items listed on the [Translating Picture Text topic](#) before doing so, however.

### Example 3: Switch the Language of Single Picture to a Desired Language in Run Mode

In the following example, two buttons are created to dynamically switch the language on the currently open picture in run mode regardless of the TranslateOnOpen and LanguageDesired properties. In this example, the SwitchLanguage method is used to perform this task.

1. Create a picture and name it *MyPicture.grf*.
2. Add two push buttons labeled "Switch to English" and "Switch to Español", as in the following picture.



*Language Buttons*

3. In configure mode, right-click the Switch to English push button and choose Edit Script. The Visual Basic Editor appears.
4. Enter the following script to set the language:

```
Me.SwitchLanguage 9
```

5. Repeat steps 3 and 4, with the Switch to Español button, but replace the `Me.SwitchLanguage 9` line with `Me.SwitchLanguage 1034` (1034 is the enumeration that represents Spanish, whereas 9 represents English).

**NOTE:** For a listing of the enumerations for all supported languages (also called LCIDs) refer to the [Language Letter Acronyms table](#) in the [Exporting and Importing Language Files](#) topic.

6. Close the Visual Basic Editor and save the picture with a unique name.
7. Add some English text to the picture, and save the picture.
8. Export a Spanish CSV language file for your picture, so you can provide translations for the text you added in the previous step. For steps, refer to the [Exporting a Single Language File](#) section.
9. Export an English CSV language file for your picture, so that English text displays when you switch picture languages.

**NOTE:** For each language that you want to use in your picture, prepare a translation file. For example, if your picture has English, Spanish, and French, you need to create a translation file for English, Spanish, and French. To create a translation .CSV file, refer to the [Exporting a Single Language File](#) section.

10. Open the Spanish CSV language file in Notepad and translate the picture text to Spanish. For steps, refer to the [Editing a Language File](#) section.

**NOTE:** If the list separator is a comma in your local regional settings, you can use Microsoft Excel to edit your .CSV files. Otherwise, it is recommended that you use Notepad to edit your .CSV files. It is important that you use the proper text editor, so that the list separator, a comma, gets saved properly using your operating system's native regional settings. If you are unsure of your settings, use Notepad to edit your .CSV files.

11. Make sure the Translate Picture on Open check box on the Picture Preferences tab of the User Preferences dialog box is cleared.
12. Switch to run mode and toggle between the two languages:
  - Click the Switch to Español button. Your picture displays text in Spanish.
  - Click the Switch to English button. Your picture displays text in English.

#### **NOTES:**

- If a picture does not have a language file for the language you are displaying in, the text will remain in the default language in which it was created.
- You can create as many push buttons as you want to switch between multiple languages. Be sure that you review the important items listed on the [Translating Picture Text](#) topic before doing so, however.

## **How Do I...**

In the iFIX WorkSpace, you can perform steps when working with picture text languages:

- [Configuring the Default Language Settings for All Pictures](#)
- [Configuring Language Settings for an Individual Picture](#)
- [Exporting a Single Language File](#)
- [Exporting Multiple Language Files](#)
- [Editing a Language File](#)
- [Importing a Language File in Configuration Mode](#)

### **Configuring the Default Language Settings for All Pictures**

If you develop your picture(s) in one language (in configure mode), but want to provide the text in a different language for operators viewing pictures (in run mode), you can do this in the WorkSpace. Use the steps below if you want all pictures set to the same default language for run mode viewing.

If you use the global language setting, it is recommended that you do not implement language settings at the individual picture-level.

**NOTE:** You will also need to export language CSV files for each picture and provide translations in each of these files using Notepad or Microsoft Excel to support this feature. A link to these steps is provided below.

**IMPORTANT:** If you are using the iFIX WebSpace, it is recommended that you configure your language settings at the individual picture-level. If you instead configure them globally using the steps below, all users will have the same language settings for all pictures, after the script is run. This may be undesirable for your web users. For steps on picture-level configuration, refer to the [Configuring Language Settings for an Individual Picture](#) section.

► **To configure default language for all pictures when opened in run mode:**

1. Open the iFIX WorkSpace in configuration mode.
2. In Classic view, on the WorkSpace menu, click User Preferences.  
-Or-

In Ribbon view, on the Home tab, in the WorkSpace group, click Settings, and then click User Preferences.

3. Click the Picture Preferences tab and **select** the Translate Picture On Open check box. (If it is selected, the LanguageDesired and TranslateOnOpen properties at the picture-level cannot be changed from the Properties window.)
4. In the Language drop-down, select the default you want to set for all pictures.
5. Click OK.
6. Create language CSV files for your pictures that you want to translate the text for on open. Refer to the [Exporting Multiple Language Files](#) section for steps on how to generate your CSV files.

## Configuring Language Settings for an Individual Picture

If you develop a picture in one language (in configure mode), but want to provide the text in a different language for operators viewing the picture (in run mode), you can do this in the WorkSpace. Use the steps below if you want a single picture to display a different language in run mode.

If you use the individual picture-level settings, it is recommended that you do not implement the global, default language settings.

**NOTE:** You will also need to export a language CSV file for the picture and provide translations for this file in Notepad or Microsoft Excel to support this feature. These steps are included below.

► **To configure the language for a single picture when opened in run mode:**

1. In the iFIX WorkSpace configuration mode, open the picture with the text strings you want to translate.
2. In Classic view, on the WorkSpace menu, click User Preferences.

-Or-

In Ribbon view, on the Home tab, in the WorkSpace group, click Settings, and then click User Preferences.

3. Click the Picture Preferences tab and make sure the Translate Picture On Open check box is **cleared**. (If it is cleared, the LanguageDesired and TranslateOnOpen properties at the picture-level can be changed from the Properties window.)
4. Click OK.
5. Right-click anywhere in the picture and choose Property Window.
6. From the LanguageDesired property, select the language you want to use for the language CSV file.

**NOTE:** If you are entering this information programmatically in VBA instead of using the Property window, you can find a listing of the enumerations for all supported languages (also called LCIDs) in the [Language Letter Acronyms](#) table in the [Exporting and Importing Language Files](#) topic.

7. From the TranslateOnOpen property, select True so that the displayed picture text will be automatically translated when the picture is opened in run mode.

8. Save the picture.
  9. On the Translation Toolbar, click the Export language file button. The language CSV file is saved to the PIC folder.
  10. Open the language CSV file in Notepad or Microsoft Excel and translate the text strings.
- IMPORTANT:** If list separator is comma in your local regional settings, you can use Microsoft Excel to edit your .CSV files. Otherwise, it is recommended that you use Notepad to edit your .CSV files. It is important that you use the proper text editor, so that the list separator, a comma, gets saved properly using your operating system's native regional settings. If you are unsure of your settings, use Notepad to edit your .CSV files.
11. Open the picture in run mode. The picture's text strings are displayed in the translated language.

## Exporting a Single Language File

### ► To export a single language file:

1. In the WorkSpace configuration mode, open the picture you want to export a language file for.
  2. In Classic view, on the WorkSpace menu, click User Preferences.
- Or-
- In Ribbon view, on the Home tab, in the WorkSpace group, click Settings, and then click User Preferences.
3. Click the Picture Preferences tab and make sure the Translate Picture On Open check box is **cleared**. If it is selected, the LanguageDesired and TranslateOnOpen properties in the Properties window cannot be changed.
  4. Click OK to close the User Preferences dialog box.
  5. Right-click in the picture (in an area without any objects) and choose Property Window.
  6. From the LanguageDesired list, select the language that you want to generate a CSV for.
  7. From the TranslateOnOpen list, select Yes.
  8. Display the Translation toolbar, if it is not already open. To do so:
    - a. In the tree view area, open the Project Toolbar Files folder and then the Toolbars folder.
    - b. Double-click TranslationToolbar to open the toolbar.
  9. On the Translation toolbar, click the Export language file button. A message appears letting you know the language file was successfully exported.

You can now open the language file in Notepad or Microsoft Excel and translate the text strings for the picture.

**IMPORTANT:** If list separator is comma in your local regional settings, you can use Microsoft Excel to edit your .CSV files. Otherwise, it is recommended that you use Notepad to edit your .CSV files. It is important that you use the proper text editor, so that the list separator, a comma, gets saved properly using your operating system's native regional settings. If you are unsure of your settings, use Notepad to edit your .CSV files.

## Exporting Multiple Language Files

### ► To export multiple language files:

1. In the iFIX WorkSpace, display the Translation toolbar, if it is not already open. To do so:
  - a. In the tree view area, open the Project Toolbar Files folder and then the Toolbars folder.
  - b. Double-click TranslationToolbar to open the toolbar.
2. On the Translation toolbar, click the Export multiple language files button.
3. In the Select pictures list, select the check box for each picture you want to export a language file for.
4. If applicable, select the Always overwrite existing export files check box. If you are exporting a language file for a picture that already has a language file for the selected language, the existing language file will be automatically overwritten. If you clear this check box, you will be prompted to replace the existing language file. Click Yes to replace it and No to keep it.
5. From the Select language list, choose the language that you want to provide translations for.
6. Click Export. A separate language file is created for each picture you selected.

You can now open each language file in Notepad or Microsoft Excel, and translate the text strings for the pictures.

**IMPORTANT:** If list separator is comma in your local regional settings, you can use Microsoft Excel to edit your .CSV files. Otherwise, it is recommended that you use Notepad to edit your .CSV files. It is important that you use the proper text editor, so that the list separator, a comma, gets saved properly using your operating system's native regional settings. If you are unsure of your settings, use Notepad to edit your .CSV files.

## Editing a Language File

### ► To edit a language file:

1. In Windows Explorer, locate the CSV file for your picture text translations. It is saved in the same folder as your pictures. By default, this folder is C:\Program Files (x86)\GE\iFIX\PIC.

**NOTE:** The file name is appended with the language abbreviation. For example, a Spanish translation file would be appended with \_ES, such as MyPicture\_ES.csv.

2. In Notepad or Microsoft Excel, open the CSV file.

**IMPORTANT:** If list separator is comma in your local regional settings, you can use Microsoft Excel to edit your .CSV files. Otherwise, it is recommended that you use Notepad to edit your .CSV files. It is important that you use the proper text editor, so that the list separator, a comma, gets saved properly using your operating system's native regional settings. If you are unsure of your settings, use Notepad to edit your .CSV files.

3. Provide translations in the Translated Text segments, and make adjustments to fonts and point sizes as necessary.
4. Save the file.

## Importing a Language File in Configuration Mode

► To import a language file in configuration mode:

1. If you have not already done so, in Notepad or Microsoft Excel, open the picture's language file and translate the applicable text strings.

**IMPORTANT:** If list separator is comma in your local regional settings, you can use Microsoft Excel to edit your .CSV files. Otherwise, it is recommended that you use Notepad to edit your .CSV files. It is important that you use the proper text editor, so that the list separator, a comma, gets saved properly using your operating system's native regional settings. If you are unsure of your settings, use Notepad to edit your .CSV files.

2. In the iFIX WorkSpace configuration mode, open the picture whose language file you translated.
3. If applicable, set the LanguageDesired property to the same language letter acronym used in the language file name.
4. Display the Translation toolbar, if it is not already open. To do so:
  - a. In the tree view area, open the Project Toolbar Files folder and then the Toolbars folder.
  - b. Double-click TranslationToolbar to open the toolbar.
5. On the Translation toolbar, click the Import language file button. The picture text is immediately displayed in the translated language from the language file.

**NOTE:** Importing language files is useful if you want to save your pictures with the translated text strings.

## Using Tag Groups in Pictures

Tag groups allow you to create one picture to show multiple representations of your process. For example, you can use one picture to represent similar lines on a plant floor. You use the iFIX Tag Group Editor (TagGroupEditor.exe) to create these tag groups in iFIX.

A *tag group* is composed of a symbol, a corresponding substitution, and an optional description field. *Symbols* are placeholders for data sources or text in a picture. *Substitutions* are alphanumeric character strings that replace symbols in a picture. A *tag group file* is a binary file that consists of the symbols, substitutions, and descriptions for each tag group.

You use symbols in areas of your picture where data points are needed to represent specific process values. A substitution can be a tagname or text, depending on where the corresponding symbol is being used in a picture. For example, if you want to change a button label when a picture opens, you would enter text for the substitution.

You can create several tag group files that associate symbols with specific substitutions in the run-time environment.

### Example: Using Tag Groups in Pictures

Suppose you work in a factory that produces both oatmeal and chocolate chip cookies, and each type of cookie requires a different baking temperature. Your factory has three ovens that are controlled by different databases with a similar block structure: Analog Input and Analog Output.

Your real-time control strategy calls for operators to monitor the temperature in each furnace. This strategy calls for you to develop three operator displays. You realize, however, that the only difference between the displays are the tagnames that reference different databases.

You can use the Tag Group Editor to cut development time and save a considerable amount of disk space by creating one picture and three tag group files. In the picture, you assign symbols in place of tagnames and then, at run time, call a tag group file to replace the symbols with real tagnames. You call a different tag group depending upon which cookie furnace you want to display.

## Using the Tag Group Editor

The Tag Group Editor (TagGroupEditor.exe) is a simple spreadsheet interface that allows you to develop multiple tag group files and apply them to one picture. The tags can reside in different databases.

You enter data into the Tag Group Editor spreadsheet to associate symbols with substitutions. You then save the data in a tag group file, with the extension TGD. When a picture opens, or when a new picture replaces the current picture, iFIX reads the tag group file and replaces the symbols with the corresponding substitutions, as defined in the tag group file.

**NOTE:** The Recipe Builder requires the .TGE file format when using tag group files. As such, the Recipe Builder uses the FIX32 Tag Group Editor (TGE.EXE). The iFIX Tag Group Editor (TagGroupEditor.exe) is used for creating tag groups in iFIX pictures in .TGD file format. The Recipe Builder cannot use these newer .TGD files.

## Getting Ready to Use the Tag Group Editor

Tag groups are most efficiently implemented when your database design is stable and complete. You should perform the following tasks before you begin to develop tag group files:

- Before you develop your database, adopt a standard naming convention.
- For example, for the temperature of Oven1, name the Analog Input block TOV01. For the corresponding block in Oven2, name it TOV02.
- Develop a list of similar tagnames that exist in the same database, or in different nodes or databases. The list should include the data system, node name, tagname, block type, field name, and symbol.
- This list helps you create multiple tag group files quickly and accurately.

## Starting the Tag Group Editor

In Classic view, start the Tag Group Editor from the iFIX WorkSpace by clicking the Tag Group Editor button on the Application toolbar shown below:



*Tag Group Editor Button on the Application Toolbar*

In Ribbon view, on the Applications tab, in the Utilities group, click Tag Group Editor.

## The Tag Group Editor Window

The Tag Group Editor window looks similar to the following:

	Symbol	Substitution	Get Full Name	Description
1	FREQUENCY	Fix32.THISNODE.Frequency_F		
2	INCLINOMETER	Fix32.THISNODE.inclinometer_F		
3	LEAK	Fix32.THISNODE.Leak_a_cv		
4	LOADCELL	Fix32.THISNODE.LoadCell_F_C		
5	PRESSURESENSOR	Fix32.THISNODE.PressureSens		Pressure Sensor 1
6	TRANSMITTER	Fix32.THISNODE.Transmitter_F		
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				

*Tag Group Editor Window*

## Creating and Opening Tag Group Files

Once you start the Tag Group Editor, you are ready to work with tag group files. You can start by creating a new tag group file or you can open an existing one.

To open an existing tag group file, click the Open button. To open a new, empty tag group file, click the New button.

You can have only one tag group file open at a time. If you made changes to a file that is currently open, you will be prompted to save it.

To save a tag group file, click the Save button. Tag group files are automatically saved with the .TGD extension in the iFIX\PIC directory.

**NOTE:** The tag group file must be located in the iFIX\PIC directory for tag group substitutions to work correctly.

## Column Definitions for the Tag Group Editor

The following table describes the columns of the Tag Group Editor spreadsheet and the information that you can enter into them.

**NOTE:** You can access these columns only when a row is active. Click a row to make it active.

**Column Definitions for the Tag Group Editor**

Column	Definition	Valid Field Values
Symbol	The text that is replaced by a substitution string.	(Required field) Can contain up to 60 characters. The first character must be a letter.
Substitution	The tagname or text of the substitution, depending upon where the corresponding symbol is being used in the picture.  <b>NOTE:</b> Be sure to enter the text exactly as you want it to appear in the picture. If the substitution needs to be in a specific format, make sure the text is formatted correctly.	(Required field) Can contain up to 60 characters.  <b>NOTE:</b> It is strongly recommended that you use the fully qualified name for the tagname.
Get Full Name	When you are using tagnames for substitutions, displays the fully qualified name for the tag.	-
Description	The text that describes the function of the tag group.	(Optional field) Can contain up to 60 alphanumeric characters, including special characters, such as -(*)&+% and spaces.

## Using the Tag Group Editor Toolbar

Many of the commands found on the menu bar have corresponding toolbar buttons. The following table describes the functions of the buttons that are specific to the Tag Group Editor.

## Tag Group Editor Toolbar Buttons

Clic-To...

k  
this  
but-  
to-  
n...



Cut the contents of the cell where the insertion point is positioned, and move it to the Clipboard.



Copy the contents of the cell where the insertion point is positioned, and place it on the Clipboard.



Paste the contents of the Clipboard into the cell where the insertion point is positioned.



Delete the contents of the cell where the insertion point is positioned.



Add a row to the end of the spreadsheet.



Insert a row above the row containing the insertion point.



Delete the row where the insertion point is positioned.



Retrieve all the symbols from your picture and insert them into the Symbol column of the spreadsheet.

**NOTE:** Use this button only if all the substitutions in the tag group file are tagnames and none are text.



Retrieve the fully qualified name for all tags entered in the Substitution column.



Change the font displayed in the Tag Group Editor.

## Using the Tag Group Editor Spreadsheet

You can enter and edit Symbols, Substitutions, and Descriptions in the Tag Group Editor spreadsheet.

You can also use some special functions to automate data entry or to manipulate the data in the spreadsheet. These functions are described in the sections that follow.

### Retrieving Fully Qualified Names for Substitutions in a Spreadsheet

A fully qualified tagname consists of four parts:

- Data system
- Node
- Tag
- Field

Each element is separated by periods, as shown in the following example:

Fix32.THISNODE.AI1.F\_CV

In this example, Fix32 is the name of the data system, THISNODE is the node name, AI1 is the tagname, and F\_CV is the field name.

From the Tag Group Editor, you can automatically:

- Insert a fully qualified name for an individual tagname.
- Retrieve the fully qualified names for all substitutions in a spreadsheet. (All of substitutions in the spreadsheet must be tagnames; none of them can be text.)

**NOTE:** It is strongly recommended that you use the fully qualified names of tags for substitutions in a spreadsheet.

### Using the Data Entry Dialog Box to Define Substitutions

Double-clicking the item number in the Tag Group Editor spreadsheet displays the Data Entry dialog box, from which you can:

- Access the Data Source Browser expression builder to define the substitution.
- Create the data source for a substitution tagname.
- Retrieve the fully qualified name for a substitution tagname.

### Sorting Data in the Spreadsheet

You can sort the data in any column in the Tag Group Editor spreadsheet.

### Searching and Replacing Substitutions

You can make multiple changes to tagname substitutions. This involves:

- Converting the file to comma separated value (CSV) format
- Making the changes in a third-party spreadsheet or text editor
- Re-opening and re-saving the file in the Tag Group Editor.

**IMPORTANT:** GE ships two Tag Group Editors: one is for use with pictures and the other is for use with recipes. The Tag Group Editor discussed in this manual is intended for use with pictures. To use the Tag Group Editor with recipes, double-click the icon for the TGE.EXE program, located in your iFIX root directory.

### Retrieving Symbols from a Picture

You may have so many symbols in a picture that entering all of them into the spreadsheet would be very time-consuming. To automatically retrieve all the symbols from a picture and insert them into the spreadsheet, you can use the Get Symbols From Picture button on the Tag Group Editor toolbar. The Symbols column is cleared and all of the symbols from the picture, including symbols that are used in a picture's script, are automatically inserted into the spreadsheet. You can then alphabetically sort the symbols by clicking the Symbol column heading.

**NOTE:** If you add new symbol substitutions on text, pushbutton, or variable objects to a picture, these symbols will NOT be read into the Tag Group Editor until the picture is resaved. New symbols on the objects in question will only be read into the Tag Group Editor when the picture is saved.

## Using Tag Group Symbols in Pictures

You can enter tag group symbols in a picture for the following object properties:

- Command button caption
- Variable object current value

- Text object caption
- Animation data source
- Chart pen data source (historical and real-time)
- Enhanced chart data source (historical and real-time)
- Event data source
- Data link data source
- Historical data link data source

You can also use tag group symbols with the following picture methods in a script:

- TagGroupValue
- TagGroupSubstitution

## Implementing a Tag Group Strategy

There are three major tasks that you must perform to successfully implement your tag group strategy:

1. Create a picture that uses symbols in areas where data points are needed to represent a specific process value. For more information, refer to [Creating and Opening Pictures](#).
2. Create several different tag group files that associate the symbols in the picture with different tags.
3. Assign the tag group file to load when a picture opens, or when a new picture replaces an existing one. For more information, refer to [Assigning a Tag Group File to a Picture Event](#).

## Entering a Symbol in a Picture

When you enter a symbol in a picture, you must type an at sign (@) at the beginning and end of the symbol name. This allows the iFIX software to differentiate tag group symbols from ordinary text.

**NOTE:** When defining symbols in the Symbol column of the Tag Group Editor, you only need to enter the symbol name, not the @ signs.

### Example

You want to enter a data link in a picture that displays the value of a temperature output block. You will use this picture three times to show three similar processes. To use a symbol called Temperature in the picture, enter the following for the data link:

```
@Temperature@
```

When the iFIX software reads text in this format, it identifies the text as a tag group symbol. When a picture opens, or a new picture replaces the current one, the symbol is replaced with the assigned substitution.

In the Symbol column of the Tag Group Editor you would enter:

Temperature

For more information, see [Syntax Guidelines for Symbols in Pictures](#).

## Using Partial Substitutions

You may only want to substitute a specific section of a tag or a string of text. This is known as a partial substitution. The Tag Group Editor can perform partial substitutions. However, there are some rules you must follow:

- Make sure there is an @ sign at the beginning and end of the symbol to denote where the symbol name begins and ends.
- Keep track of your @ signs if you are using a symbol in a tagname.

For example, if you want @Tag1@ to be the symbol in a partial text substitution, you must enter:

```
@Tag1@Ready
```

For more information, see [Syntax Guidelines for Symbols in Pictures](#).

### Partial Substitution Errors in Data Sources

Be careful when using a partial substitution in a data source. If the source of a substitution does not currently exist in the data system, a connection will be forced. However, you will only know that this has occurred when you receive an error message at run time. This can happen if you made a typographical error when you entered a substitution or if you entered duplicate data.

For example, you enter a partial substitution as the source for a data link, as follows:

```
Fix32.@tag1@
```

However, in the tag group file, you entered the following substitution for @tag1@:

```
Fix32.THISNODE.AI1.F_CV
```

When this substitution occurs, the data source is now Fix32.Fix32.THISNODE.AI1.F\_CV. Since the data system thinks that this source can be created, it will force the connection.

For more information about using symbols for partial substitutions, see [Syntax Guidelines for Symbols in Pictures](#).

## Syntax Guidelines for Symbols in Pictures

To perform a partial substitution for a tag, follow the syntax guidelines below:

### Symbols in Pictures - Dos and Don'ts

#### Enter...

Node.@tag1@.f\_cv

#### Do not enter...

Node@tag1@f\_cv

#### Because...

You must separate elements with periods. In this example, there must be a period between the node and the tag, and the tag and the field.

@tag1@.@field@

@tag1@.@field

You must start and end every sym-

Node.@tag1@.field@	Node.@tag1@field@	bol with an at sign (@). In this example, a substitution will not occur for <i>field</i> because the symbol must end with an at sign (@).
cv	cv	You must separate elements with periods. Also, you cannot share at signs (@). Text beginning and ending with an at sign (@) denotes a symbol to be replaced. In this example, a substitution will occur for <i>tag1</i> but not for <i>field</i> .
@tag1@ + @tag2@	@tag1@+@tag2@	You cannot share at signs (@). In this example, a substitution will occur for <i>unit</i> but not for <i>device</i> .
(@tag1@ + @tag2@) / 2	(@tag1@ - @tag2@) / 2	You must enter a space before and after the mathematical operator (the plus sign (+) in this example). You must enter a space before and after the tag group when using parenthesis.

## Using Symbols for the Current Value of a Variable Object

When using symbols to represent a data source for the current value of a variable object, you must also assign the symbol to the initial value of the variable object. The initial value is written to the current value when a picture opens, which means the symbol will be overwritten by the content of the initial value. If you assign a symbol to the current value only, you will lose your tag group substitution.

## Using Symbols for Complex Expressions

You cannot substitute a complex expression for a single symbol. For example, you cannot substitute the following expression:

Fix32.THISNODE.AI1.F\_CV + 10

for the following symbol:

@tag1@

However, you can use partial substitutions to represent each part of the expression. For example, if you want to use symbols for the complex expression above, you would use two symbols, as follows:

@tag1@ + @tag2@

where the substitution for @tag1@ would be Fix32.THISNODE.AI1.F\_CV, and the substitution for @tag2@ would be 10.

## Assigning a Tag Group File to a Picture Event

Before substitutions can occur in the run-time environment, you must assign the tag group file to load when a picture opens.

You can also assign the tag group file to load when a new picture replaces an existing one.

## Optimizing Picture Loading in the Run-time Environment

The Tag Group Editor provides a way to get the best possible picture loading performance in the run-time environment. After you have completed the design process, you can optimize the load performance by choosing the Resolve Tags command from the File menu. When this action occurs, the picture looks for the tag group substitutions, replaces the symbols with the substitutions, and establishes connections between the objects in the picture and the true data sources.

The Tag Group Editor saves these connections, along with information identifying the version number of the picture and the tag group file, and the identifying strings after substitution, in the tag group storage file (.TGS). There is only one tag group storage file per node.

## Error Log Creation

The Tag Group Editor creates a text file, TGEERROR.LOG, in the C:\Program Files (x86)\GE\iFIX\LOCAL path, which contains a list of errors that occur during the resolution process. Make sure that you open this file and verify any errors. If there are no errors, the log will be empty.

## OPC Server Address Substitution

The steps below describe how to use an OPC address substitution with Symbols in the Tag Group Editor.

► **To use an OPC address substitution with Symbols in the Tag Group Editor:**

1. In the iFIX Tag Group Editor's Substitution field, paste the OPC address name.
2. Remove the quotes from the address name.
3. On the Tag Group Editor's File menu, click Resolve Tags.

## Importing and Exporting Tag Group Files

The Tag Group Editor can import and export tag group information that is formatted as a comma separated value (.CSV) file. Comma separated value files are useful if you want to exchange tag group information with a third-party text editor, spreadsheet, or word processor.

Comma separated value files have several benefits:

- You can enter tag group information into an application, such as Microsoft Excel or a text editor, that you are more familiar with and then import this information into the Tag Group Editor.

- You can generate a report by printing the comma separated value (.CSV) file as a text file. The report provides a list of all symbols, substitutions, and descriptions defined in the Tag Group Editor spreadsheet. This list can help you verify your tag groups *before* you implement them into your SCADA strategy.

## Understanding the CSV File Format

If you use Microsoft Excel or another spreadsheet application that provides a CSV file format option, the application does all the required formatting for you. However, if you prefer to use a text editor, you must follow some simple formatting rules to ensure that the text file is successfully imported into the Tag Group Editor.

### CSV File Formatting Rules

Each line in your text file represents one row when opened in the Tag Group Editor. Use the following rules when formatting your text file:

- Enter the information in the same order as it appears in the Tag Group Editor spreadsheet: symbol, substitution, description.
- The symbols, substitutions, and descriptions that you enter into your text file have the same length limitations as the corresponding component in the Tag Group Editor spreadsheet.
- Use a list separator to separate each component of the tag group. You must use the list separator that is defined through Regional Settings, Number tab, in Control Panel. In most cases, this is a comma (,).
- Do not include comments or blank lines in your CSV file. If you do, a message appears at the point that the Tag Group Editor first encounters either a comment or a blank line, and the file will stop loading.
- The first line of your CSV file *must* contain only the total number of lines, or tag group entries, in the tag group file. For example, if your CSV file contains six tag groups, the first line of the file should be the following:

"6"

If your CSV file does not contain this line, it will not open in the Tag Group Editor.

- If the name of a symbol, substitution, or description contains a quotation mark ("") or the same list separator defined through Regional Settings in Control Panel, you must do the following:
  - Enclose that item in quotation marks.
  - Type an extra quotation mark before each quotation mark within that item.

For example, if you are entering a symbol named OVEN"TEMP1 into your text editor, you must type "OVEN""TEMP1" as your symbol name.

### Example: A Sample CSV File

Each line in a CSV file represents a row in the Tag Group Editor spreadsheet, except the first line. The first line of a CSV file represents the total number of tag groups contained in the tag group file. The following example depicts a CSV file created by the Tag Group Editor.

```
"3"
"OVENTEMP1", "Fix32.THISNODE.AI1.F_CV", "Oven 1 current temperature"
"OVENTEMP2", "Fix32.THISNODE.AI2.F_CV", "Oven 2 current temperature"
"OVENTEMP3", "Fix32.THISNODE.AI3.F_CV", "Oven 3 current temperature"
```

As this example shows, tag group components are separated by a list separator and enclosed in quotation marks. The Tag Group Editor does this as a safeguard even though the only items that require quotation marks are list separators used within an item, and other quotation marks. In fact, you can delete the quotation marks around any component that does not contain a defined list separator or quotation mark.

## Exporting a Tag Group File as a CSV File

You can export a tag group file to a file in comma separated value (CSV) format. Then you can view the information in a text editor or in Microsoft Excel or another spreadsheet application that provides a CSV file format option.

## Converting 6.x Tag Group Files

You must convert all tag group files created in the 6.x Tag Group Editor to the current tag group file (.TGD) format. You do this by opening the file in the 6.x Tag Group Editor, and saving it as a CSV file. You then convert the CSV file to a TGD file by choosing the Convert CSV Files to TGD Files command in the File menu.

## Tag Group Editor Dialog Boxes

The iFIX Tag Group Editor includes the following dialog boxes (listed in alphabetical order):

- [Convert 6.x CSV Files Dialog Box](#)
- [Data Entry Dialog Box](#)
- [Tag Group Editor Main Window](#)

### Convert 6.x CSV Files Dialog Box

The Convert 6.x CSV Files dialog box displays the following items:

#### 6.x .CSV File Directory

Enter the path to the directory containing your 6.x CSV files. The path must end with a backslash (\).

#### CSV File List

Select the files you want to convert. You can select more than one file by pressing and holding down the <CTRL> key.

#### Update .CSV File List

Click this button to update the contents of the CSV File List. You must click this button after you enter a file path in the 6.x .CSV File Directory box.

#### Select All

Click this button to select all of the files in the CSV File List.

### Deselect All

Click this button to deselect all of the currently selected files in the CSV File List.

## Data Entry Dialog Box

The Data Entry dialog box displays the following items:

### Symbol

Enter a symbol that is defined in your picture. Do not enter the starting and ending delimiters (@). For example, if you enter @tag1@ as a symbol in a picture, you only have to enter tag1 in the spreadsheet.

**Valid values** - Can contain up to 60 alphanumeric characters. The first character must be a letter. This field is mandatory.

### Substitution

Enter a substitution for the defined symbol. You can enter a tagname or text, depending upon where the corresponding symbol is being used in a picture. Click Browse to open the Expression Builder. Click Modify Database Block to modify a database block directly without opening the Database Manager.

**Valid values** - Can contain up to 1024 alphanumeric characters. The first character must be a letter. This field is mandatory.

### Browse

Click Browse to open the Expression Builder.

### Modify Database Block

Click Modify Database Block to modify a database block directly without opening the Database Manager.

### Get Full Name

Click Get Full Name to get the fully qualified name for a tag. For example, if you enter A1 in the Substitution field and have an AI1 database block defined in your database, the *Default Data System.Node.AI1.Field* is automatically entered when you click the Get Full Name button. Use this button when you want to perform a full tag substitution.

### Description

Enter text that describes the function of the tag group.

**Valid values** - Can contain up to 256 alphanumeric characters, including special characters, such as - (\*)&+% and spaces. This field is optional.

## Tag Group Editor Main Window

The Tag Group Editor main window displays the following items:

## Symbol

Enter a symbol that is defined in your picture. Do not enter the starting and ending delimiters (@). For example, if you enter @tag1@ as a symbol in a picture, you only have to enter tag1 in the spreadsheet.

**Valid values** - Can contain up to 60 alphanumeric characters. The first character must be a letter. This field is mandatory.

## Substitution

Enter a substitution for the defined symbol. You can enter a tagname or text, depending upon where the corresponding symbol is being used in a picture. Click Browse to open the Expression Builder. Click Modify Database Block to modify a database block directly without opening the Database Manager.

### IMPORTANT:

- It is recommended that you use the fully qualified tagnames or explicitly use the F\_CV field in the substituted text.
- If the object of your substitution is an element in an OPC server address that includes double quotes surrounding its data items, you should not include the double quotes in the tag group substitution string. Substitution strings enclosed in double quotes may cause issues with partial data source substitutions.

**Valid values** - Can contain up to 255 alphanumeric characters. The first character must be a letter. This field is mandatory.

## Get Full Name

Click Get Full Name to get the fully qualified name for a tag. For example, if you enter A/1 in the Substitution field and have an AI1 database block defined in your database, the *Default Data System.Node.AI1.Field* is automatically entered when you click Get Full Name. Use this button when you want to perform a full tag substitution.

## Description

Enter text that describes the function of the tag group.

**Valid values** - Can contain up to 60 alphanumeric characters, including special characters, such as - (\*)&+% and spaces. This field is optional.

## How Do I...

Click any of the following links for more information about the Tag Group Editor:

- [Performing Basic Functions](#)
- [Entering Data into the Spreadsheet](#)
- [Editing a Tag Group File](#)
- [Resolving Tags With a Picture](#)
- [Assigning a Tag Group File to a Picture Event](#)
- [Importing and Exporting Tag Group Files](#)

## Performing Basic Functions

Click any of the following links for more information about performing basic functions in the Tag Group Editor:

- [Creating a New Tag Group File](#)
- [Opening an Existing Tag Group File](#)
- [Changing the Font](#)
- [Saving a Tag Group File](#)
- [Closing a Tag Group File](#)
- [Exiting the Tag Group Editor](#)

## Creating a New Tag Group File

### ► To create a new tag group file:

1. In Classic view, in the iFIX WorkSpace, on the toolbar, click the Tag Group Editor button.  
-Or-
- In Ribbon view, on the Application tab, in the Utilities group, click Tag Group Editor.
2. Click the New toolbar button.
3. Enter the symbol, substitution, and description data for all of the tag groups that you want to define.
4. When you are done, click the Save toolbar button. The Save As dialog box appears. By default, it is set to the C:\Program Files (x86)\GE\iFIX\PIC path.
5. Enter a file name, and click Save. The file is saved with a .TGD extension.

### TIPS:

- You can have only one tag group file open at a time. If you made changes to a file that is currently open, you will be prompted to save it. The iFIX Tag Group Editor replaces the currently open file with a new, empty tag group file.
- The tag group file must be located in the C:\Program Files (x86)\GE\iFIX\PIC directory for tag group substitutions to work correctly.
- You can use an existing tag group file as a template from which to create a new tag group file. When you are ready to save your changes, make sure that you save this file with a different file name.

## Opening an Existing Tag Group File

### ► To open an existing tag group file:

1. In Classic view, in the iFIX WorkSpace, on the toolbar, click the Tag Group Editor button.  
-Or-
- In Ribbon view, on the Application tab, in the Utilities group, click Tag Group Editor.
2. Click the Open toolbar button. The Open dialog box appears. By default, it is set to the C:\Program Files (x86)\GE\iFIX\PIC path.
3. Select the tag group file that you want to open, and click Open.

#### TIPS:

- You can have only one tag group file open at a time. If you made changes to a file that is currently open, you will be prompted to save it. The iFIX Tag Group Editor replaces the currently open file with the file that you selected.
- The tag group file must be located in the C:\Program Files (x86)\GE\iFIX\PIC directory for tag group substitutions to work correctly.

## Changing the Font

#### ► To change the font:

1. In the iFIX Tag Group Editor, click the Set Font toolbar button.
2. Select the font, font style, and size that you want to be displayed in the Tag Group Editor, and click OK.

## Saving a Tag Group File

#### ► To save a tag group file:

1. In the iFIX Tag Group Editor, click the Save toolbar button. If you haven't previously saved the file, the Save As dialog box appears. By default, it is set to the C:\Program Files (x86)\GE\iFIX\PIC path.
2. Enter a file name, and click Save. The file will be saved with a .TGD extension.

#### TIPS:

- If information is missing from the spreadsheet, a message will appear:
- If you left a symbol cell blank, you must fill in the missing information before you can save the tag group file. When you have finished, click the Save toolbar button again.
- If you left a substitution cell blank, choose Yes to save the file. Choose No to fill in the missing substitution before you save.
- The tag group file must be located in the C:\Program Files (x86)\GE\iFIX\PIC directory for tag group substitutions to work correctly.

## Closing a Tag Group File

Once the iFIX Tag Group Editor opens a tag group file, it cannot open another until the active file is closed.

#### ► To close a tag group file:

1. In the iFIX Tag Group Editor, click the Open toolbar button. The iFIX Tag Group Editor closes the active file and opens the file that you selected.
2. If you made changes to the active file, you will be prompted to save it.

## Exiting the iFIX Tag Group Editor

► To exit the iFIX Tag Group Editor:

1. In the iFIX Tag Group Editor, click Exit on the File menu.
2. If you made changes to a file that is currently open, you will be prompted to save it before the iFIX Tag Group Editor closes.

## Entering Data into the Spreadsheet

Click any of the following links for more information about entering data into the spreadsheet:

- [Entering Symbols Directly into the Spreadsheet](#)
- [Entering Substitutions Directly into the Spreadsheet](#)
- [Entering Descriptions Directly into the Spreadsheet](#)
- [Entering Data If You Don't Know the Substitution Name](#)

### Entering Symbols Directly Into the Spreadsheet

► To enter symbols directly into the spreadsheet:

1. In Classic view, in the iFIX WorkSpace, on the toolbar, click the Tag Group Editor button.  
-Or-
2. Create a new tag group file.
3. Make sure the picture for which you are creating a tag group file is open in the iFIX WorkSpace.
4. Click the Get Symbols From Picture button on the toolbar. The Symbols column is filled in with the symbols defined in the picture.

**TIP:** You can also enter a symbol directly into the symbol cell.

### Entering Substitutions Directly Into the Spreadsheet

► To enter substitutions directly into the spreadsheet:

1. In Classic view, in the iFIX WorkSpace, on the toolbar, click the Tag Group Editor button.  
-Or-
2. Create a new tag group file.
3. Make sure the picture for which you are creating a tag group file is open in the iFIX WorkSpace.
4. Click the Get Substitutions From Picture button on the toolbar. The Substitutions column is filled in with the substitutions defined in the picture.

2. In the iFIX Tag Group Editor, enter either a tagname or text directly into a substitution cell.
3. If you are substituting a tagname for a symbol, click the Get Full Name button. The fully qualified name for that tag is inserted into the substitution cell.

For example, if you enter AI1 in a substitution cell and click the Get Full Name button next to it, FIX32.THISNODE.AI1.F\_CV automatically appears in the substitution cell. If the data source does not exist, a message will appear asking if you want to create it.

**TIP:** If you want to retrieve all of the fully qualified names at once, enter all of the tagnames into the spreadsheet, and click the Get Full Name column heading. The fully qualified names for all of the tagnames are automatically inserted into the Substitution column.

## Entering Descriptions Directly Into the Spreadsheet

► To enter descriptions directly into the spreadsheet:

1. In Classic View, in the iFIX WorkSpace, on the toolbar, click the Tag Group Editor button.  
-Or-  
In Ribbon view, on the Application tab, in the Utilities group, click Tag Group Editor.
2. In the main window, enter the description directly into the description cell.

## Entering Data If You Don't Know the Substitution Name

► To enter data if you don't know the substitution name:

1. In Classic view, in the iFIX WorkSpace, on the toolbar, click the Tag Group Editor button.  
-Or-  
In Ribbon view, on the Application tab, in the Utilities group, click Tag Group Editor.
2. Double-click a row number. The Data Entry dialog box appears.
3. In the Symbol box, enter the text you want to use for the symbol.
4. From the Substitution list, select a tagname, or do one of the following:
  - Click Browse to open the Expression Builder dialog box.
  - Click Modify Database Block to create the data source. You must enter a tagname before you can use this button.
  - Click Get Full Name to retrieve the fully qualified name. You must enter a tagname before you can use this button.
5. In the Description box, enter text that describes the function of the tag group substitution, and click OK.

## Editing a Tag Group File

Click any of the following links for more information about editing a tag group file:

- [Editing a Cell](#)
- [Deleting the Contents of a Cell](#)
- [Inserting a Row](#)
- [Deleting a Row](#)
- [Sorting Data Alphabetically in a Column](#)
- [Searching and Replacing Substitutions](#)
- [Using OPC Server Address Substitution in the Tag Group Editor](#)

## Editing a Cell

► To edit a cell:

1. In the iFIX Tag Group Editor, select the cell. The text in the cell is highlighted.
2. Enter text over the highlighted text.

## Deleting the Contents of a Cell

► To delete the contents of a cell:

1. In the iFIX Tag Group Editor, select the cell that contains the data you want to delete.
2. Click the Delete Cell Contents toolbar button. The content of the cell is deleted.

## Inserting a Row

► To insert a row:

1. In the iFIX Tag Group Editor, select a cell.
2. Click the Insert Row toolbar button. An empty row is inserted above the row that contains the insertion point.

## Adding a Row

► To add a row:

In the iFIX Tag Group Editor, click the Add Row toolbar button. An empty row is added to the end of the spreadsheet.

## Deleting a Row

► **To delete a row:**

1. In the iFIX Tag Group Editor, select a cell in the row you want to delete.
2. Click the Delete Row toolbar button. The row that contains the insertion point is deleted.

## Sorting Data Alphabetically in a Column

► **To sort data alphabetically in a column:**

1. In the iFIX Tag Group Editor, click the heading of the column that you want to sort.
2. The column is sorted in ascending order. If you click the column heading again, the column will be sorted in descending order.

## Searching and Replacing Substitutions

► **To search and replace substitutions:**

1. In the iFIX Tag Group Editor, export your tag group file as a CSV file.
2. Open the CSV file in a third-party spreadsheet or text editor.
3. Use the text editor's find and replace functionality (usually found on the Edit menu) to make multiple changes to tagname substitutions.
4. When you have finished making changes, save the file as a CSV file, and exit the text editor.
5. Open the CSV file in the Tag Group Editor.
6. On the File menu, click Save As to re-save the CSV file as a tag group (.TGD) file.

## Using OPC Server Address Substitution in the Tag Group Editor

iFIX requires the following workaround to use the OPC Server address substitution with the Tag Group Editor (TagGroupEditor.exe). The steps below describe how to use an OPC address substitution with Symbols in the Tag Group Editor.

► **To use an OPC address substitution with Symbols in the Tag Group Editor:**

1. In the iFIX Tag Group Editor's Substitution field, paste the OPC address name.
2. Remove the quotes from the address name.
3. On the File menu, click Resolve Tags.

## Resolving Tags With a Picture

► **To resolve tags with a picture:**

1. In Classic view, in the iFIX WorkSpace, on the toolbar, click the Tag Group Editor button.  
-Or-  
In Ribbon view, on the Application tab, in the Utilities group, click Tag Group Editor.
  2. On the File menu, click Resolve Tags.
  3. Enter a picture file name, and click Open.
  4. Enter a tag group file name, and click Open. The operation is performed.
- TIP:** You can select more than one file by pressing and holding the <CTRL> key while you select files from the list.

## Assigning a Tag Group File to a Picture Event

Click any of the following links for more information about assigning a tag group file to a picture event:

- [Assigning a Tag Group Substitution to Occur When a Picture Opens](#)
- [Assigning a Tag Group Substitution to Occur When a Picture Replaces Another Picture](#)

## Assigning a Tag Group Substitution to Occur When a Picture Opens

► **To assign a tag group substitution to occur when a picture opens:**

1. In the iFIX WorkSpace, open the picture from which you want to open another picture.
2. Select a button or shape from which you want to open the picture.
3. In Classic view, from the iFIX WorkSpace Toolbox, click the Open Picture Expert button.  
-Or-  
In Ribbon view, on the Tools tab, in the Tasks/Experts group, click Commands, and then click Open Picture.
4. Enter the file name, or alias, of the picture that you want to open.
5. Enter the position for the picture to open in. The default position is 0,0.
6. Select the Enable Tag Group Substitution check box.
7. Enter the name of the tag group file that you want to apply to the picture upon opening, and click OK.
8. Save the changes you made to the picture, and switch to the runtime environment.

When you click the object, the picture that you selected to open displays, and the symbols in the picture are replaced with the substitutions that you defined in the tag group file.

**TIPS:**

- If you want to choose the picture to open at runtime, select the Select Picture to Open in Run Mode check box. When you switch to the runtime environment and click the object, the Open dialog box appears.

- If you want to choose the tag group file to load at runtime, select the Tag Group File in Run Mode check box. When you switch to the runtime environment and click the object, the picture to which you want to assign a tag group file appears, and then the Please Select a Tag Group Definition (TGD) File dialog box appears.
- You can open the iFIX Tag Group Editor from the Open Picture Expert dialog box by clicking the Tag Group Editor button.

## Assigning a Tag Group Substitution to Occur When a Picture Replaces Another Picture

► To assign a tag group substitution to occur when a picture replaces another picture:

1. In the iFIX WorkSpace, open the picture that you want to replace.
  2. Select a button or shape from which you want to replace the picture.
  3. In Classic view, from the iFIX WorkSpace Toolbox, click the Replace Picture Expert button.  
-Or-
- In Ribbon view, on the Tools tab, in the Tasks/Experts group, click Commands, and then click Replace Picture.
4. Enter the file name, or alias, of the picture that you want to replace.
  5. Enter the file name of the picture that you want to make the replacement with.
  6. Select the Enable Tag Group Substitution check box.
  7. Enter the name of the tag group file that you want to apply to the replacement picture upon opening, and click OK.
  8. Save the changes you made to the picture, and switch to the runtime environment.

When you click the object, the picture that you selected gets replaced by the replacement picture, and the symbols in the replacement picture are replaced with the substitutions that you defined in the tag group file.

### TIPS:

- If you want to replace the current picture at runtime, select the Replace Current Picture in Run Mode check box. When you switch to the runtime environment and click the object, the current picture closes and the replacement picture appears.
- You can open the iFIX Tag Group Editor from the Open Picture Expert dialog box by clicking the Tag Group Editor button.

## Importing and Exporting Tag Group Files

Click any of the following links for more information about importing and exporting tag group files:

- [Converting One or More 6.x Tag Group Files](#)
- [Exporting a Tag Group File as a CSV File](#)

## Converting One or More 6.x Tag Group Files

The iFIX Tag Group Editor lets you convert multiple tag group files created in version 6.x of FIX.

► **To convert multiple tag group files:**

1. Start iFIX and open the iFIX WorkSpace.
2. In the 6.x Tag Group Editor, make sure you have saved the tag group files as CSV files.
3. In Classic view, in the iFIX WorkSpace, on the toolbar, click the Tag Group Editor button.  
-Or-
- In Ribbon view, on the Application tab, in the Utilities group, click Tag Group Editor.
4. On the File menu, click Convert CSV Files to TGD Files. The Convert 6.x CSV Files dialog box appears. By default, it is set to the C:\Program Files (x86)\GE\iFIX\PIC path.
5. In the 6.x .CSV File Directory box, enter the path to the directory where your 6.x CSV files are located, and click the Update .CSV File List button. The path must end with a backslash (\), similar to the following:  
`C:\Program Files (x86)\GE\iFIX\PIC\`
6. Select the files you want to convert, and click OK. The files will be saved with a .TGD extension.

## Exporting a Tag Group File as a CSV File

► **To export a tag group file as a CSV file:**

1. In the iFIX Tag Group Editor, on the File menu, click Save As. The Save As dialog box appears. By default, it is set to the C:\Program Files (x86)\GE\iFIX\PIC path.
2. From the Save as type list, select CSV Files (\*.CSV).
3. Enter a file name, and click Save. The file will be saved with a .CSV extension.

**TIP:** The tag group file must be located in the C:\Program Files (x86)\GE\iFIX\PIC directory for tag group substitutions to work correctly.

## Working with Dynamo Objects

A *Dynamo object* is an object or group of objects that you store in a Dynamo Set and can use in all of your pictures, helping to create a consistent design across your operator displays. All Dynamo objects can be manipulated like any iFIX object. The Dynamo object is closest to the group object in behavior. For instance, you can drill-down into Dynamo objects within pictures to change individual objects.

You can create Dynamo objects out of both simple custom objects and objects with animations. In objects with animations, you can assign meaningful user prompts to Dynamo properties. These user prompts appear in the Dynamo Properties dialog box that opens when you double-click the Dynamo or when you first copy the Dynamo into a new picture.

Each Dynamo object includes five additional object properties:

- **Dynamo ID** - You cannot edit this field; it is a system assigned value. This value is a Globally Unique Identifier (GUID). The identifier is the same for a Master Dynamo in a Dynamo Set and all instances of the Dynamo object throughout all pictures. Use this identifier to identify instances of a Dynamo object with the Master Dynamo in a Dynamo Set.
- **Dynamo Description** - Provides a short description of the specific usage of the given Dynamo Instance. The number of characters that you can enter in this description are recorded in the Max\_Dynamo\_Desc\_Length field. The Dynamo Description can be different for each Dynamo Instance. For the Master Dynamo, the description is empty and read-only.
- **Master** - You cannot edit this field; it is a system assigned value. When True, the selected Dynamo is a Master Dynamo (within a Dynamo Set). When False, this Dynamo is a Dynamo Instance (within a picture).
- **Max\_Dynamo\_Desc\_Length** - You cannot edit this field; it is a system assigned value that is currently set to 256 characters. This field describes the maximum number of characters that you can enter into the Dynamo Description property, which is currently set at 256 characters.
- **Revision** - You cannot edit this field; it is a system assigned number for the revision. When you save a Master Dynamo inside of a Dynamo Set, and the Master Dynamo contains changes, the revision number is incremented. It's only when the Master Dynamo changes and then you save the Dynamo Set that this number increments on the Master Dynamo. iFIX uses Dynamo revision numbers during an update to determine when a Master Dynamo is newer than the Dynamo Instances created from it. Revision numbers are not updated when a Dynamo Instance within a picture is modified. During an update, when a Dynamo Instance does not equal the Master Dynamo revision number (that is, the revision number of the Dynamo Instance is lower than the Master Dynamo), the revision number on the Dynamo Instance is updated to match the Master Dynamo.

When you create a Dynamo and save it in a Dynamo Set, you create a Master Dynamo. You can use this Master Dynamo in your system pictures by dragging the Dynamo object from the Dynamo Set into a picture. If you assigned User Prompts to the Dynamo's Object Properties, the Dynamo's Property dialog box appears. This dialog box allows you to change the data sources for the Dynamo's properties.

You can create a report of Dynamo objects in your pictures, or pictures that contain specific Dynamos, by using the Cross Reference Tool. A Quick Report is generated when you run the Quick Dynamo Updater or the Dynamo Updater Wizard, both of which are available from the Dynamo Toolbar (Classic View) or on the Tools tab, in the Dynamos group, in the Dynamos list (Ribbon View).

### Master Dynamos and Dynamo Instances

A *Master Dynamo* is any Dynamo object that exists in a Dynamo Set. This term applies only to Dynamo objects. It does not include pre-built Dynamos or Dynamos created in versions of iFIX earlier than 4.5. A Master Dynamo includes an identifier so that you can identify which Dynamo objects in a picture are instances of that particular Master Dynamo. The Dynamo ID is the same in the Dynamo Instances that are derived from the master. Master Dynamo's exist only within Dynamo Sets. Once placed into an iFIX picture, a Master Dynamo becomes a Dynamo Instance.

A *Dynamo Instance* is a Master Dynamo that has been placed into a picture. A Dynamo Instance can be uniquely identified with one and only one Master Dynamo. Dynamo Instances exist only within iFIX pictures. When placed into a Dynamo Set, a Dynamo Instance becomes a Master Dynamo, possibly replacing a pre-existing Master Dynamo or simply becoming a new Master Dynamo based upon the option selected by the user. Each Dynamo Instance can have its own Dynamo description, describing how the Instance is used in the picture.

When a group containing Dynamo Instances is promoted to a Master Dynamo, as in the case when it is dragged into a Dynamo Set, the contained Dynamo Instances are converted to standard group objects. You are warned about this occurrence during Master Dynamo creation and the user is allowed the option of cancelling the operation.

If a Dynamo Instance has been resized since the last Master Dynamo update, that size is maintained on the next update. The overall height and width of the entire Dynamo Instance remains the same. The relative size of internal objects is adjusted accordingly. Be aware that not all dimensions resize, however. For example, for a pipe object, you can resize the height and width, but not the thickness of the actual pipe.

**IMPORTANT:** Be advised that if you delete a Master Dynamo and there are pictures with Dynamo Instances derived from that Master Dynamo, you will no longer be able to use the Dynamo Updater to update those Instances. Use caution when deleting any Master Dynamo in a Dynamo Set.

## Pre-Built Dynamos and Dynamos Created Before iFIX 4.5

Dynamos in some pre-built Dynamo Sets and Dynamos created before iFIX 4.5 are not considered Dynamo objects. This means you cannot use the Quick Dynamo Updater, the Dynamo Updater Wizard, and the Cross Reference Tool to update instances of these Dynamos within existing pictures. Only Dynamo objects can be updated with these tools.

Pre-built Dynamos, which are not considered Dynamo objects, include the following Dynamo Sets:

- Historical
- Miscellaneous
- Motors
- Pipes
- PipesAnim
- Pumps
- PumpsAnim
- Tanks
- TanksAnim1

- TanksAnim2
- Valves
- ValvesAnim

However, you may convert Dynamos created before iFIX 4.5 to objects using the Dynamo Converter tools. After the Dynamos have been converted, you may then use the Quick Dynamo Updater, the Dynamo Updater Wizard, and the Cross Reference Tool to update Dynamo instances.

## Determining Which Dynamo Sets Contain Dynamo Objects

The following table details which Dynamo Sets contain Dynamo Objects. Dynamo Sets created before iFIX 4.5 are not considered, and do not include, Dynamo objects; they are considered group objects, or legacy Dynamos. If a Dynamo Set does not contain Dynamo Objects, you cannot use the Quick Dynamo Updater, the Dynamo Updater Wizard, and the Cross Reference Tool to update instances of these Dynamos within existing pictures. Only Dynamo objects can be updated with these tools. To update the Dynamos in your pictures using the Dynamo Updater, you must first convert your legacy Dynamo sets, those created before iFIX 4.5 and certain pre-built sets, using the Dynamo Sets Converter.

Dynamo Set	Contains Dynamo Objects?	
	Yes	No
Emergency Stop Button		X
Gauges Horizontal Large	X	
Gauges Horizontal Medium	X	
Gauges Horizontal Small	X	
Gauges Round Large	X	
Gauges Round Medium	X	
Gauges Round Small	X	
Gauges Vertical Large	X	
Gauges Vertical Medium	X	
Gauges Vertical Small	X	
Historical		X
Miscellaneous		X
Motors		X
Panel Buttons Large		X
Panel Buttons Medium		X
Panel Buttons Small		X
Pilot Lights Large	X	
Pilot Lights Medium	X	
Pilot Lights Small	X	
Pipes		X
Pipes Anim		X
Pipes Large	X	

Pipes Small	X	
Pumps		X
Pumps Anim		X
Pumps Large	X	
Pumps Small	X	
Storage Tanks	X	
Storage Tanks Anim	X	
Switches Large	X	
Switches Medium	X	
Switches Small	X	
Tanks		X
Tanks Anim1		X
Tanks Anim2		X
Up Down Buttons		X
Valves		X
Valves Anim		X
Valves Control Hand	X	
Valves ISA Horiz Large	X	
Valves ISA Horiz Small	X	
Valves ISA Vert Large	X	
Valves ISA Vert Small	X	

## Converting Dynamos to Dynamo Objects in Pictures

Dynamos created before iFIX 4.5 are not considered Dynamo objects; they are considered group objects, or legacy Dynamos. This means you cannot use the Quick Dynamo Updater, the Dynamo Updater Wizard, and the Cross Reference Tool on legacy Dynamos. In order to be able to use the Updater tools to quickly update your Dynamos, you must convert them to Dynamo objects.

You can search for group objects, or legacy Dynamos, and convert them to Dynamo objects in multiple pictures at once using the Dynamo Converter. The Dynamo Converter is accessed using the Quick Dynamo Converter or the Dynamo Converter Wizard, both of which are available from the Dynamo Toolbar (Classic and Ribbon views) or on the Tools tab, in the Dynamo group, in the Dynamo list (Ribbon view).

When converting Dynamos inside a picture, those Dynamos are replaced with the Master Dynamo objects used in the conversion process. This replacement is not a merge; if you made changes to the Dynamo, they are overwritten by the Master Dynamo.

## The Conversion Process

The conversion process for Dynamos created before iFIX 4.5 has four stages:

Stage	Who	Does What
1	User	Use the Dynamo Sets Converter to convert old Dynamo Sets.
2	User	Link legacy Dynamos to Master Dynamos.  There are two methods for linking legacy Dynamos to Master Dynamos. <ul style="list-style-type: none"><li>• <b>The Quick Dynamo Converter.</b> Allows the user to select a Master Dynamo and Dynamo Instances to link. Requires that only one Dynamo Set and one picture is open and active.</li><li>• <b>The Dynamo Converter Wizard.</b> Allows the user to select a Master Dynamo and Dynamo Instances in multiple pictures to link.</li></ul>
3	iFIX	Convert Dynamos.  iFIX examines the differences between Dynamos and their associated Master Dynamos, and then converts the Dynamos based on the conversion behavior the user specified.
4	User/iFIX	Create links with several Master Dynamos (if necessary).  Repeat stages 2 and 3.

## Limitations

There are a few limitations when using the Dynamo Converter tools:

- **IMPORTANT:** You must backup all Dynamo Sets and pictures before conversion.
- **IMPORTANT:** All group objects are listed on the Select Dynamo tab of the Dynamo Converter. The groups are nested, and may therefore contain Dynamo objects, in addition to legacy Dynamos. If you select the top-level groups without absolute certainty that all sub-level groups contain legacy Dynamos, the conversion will produce unexpected results.
- Pictures in a shared directory that are currently open by another user are not available for conversion. A picture must be able to be opened and saved, which requires that no one else have the file open.
- Open Dynamo Sets are not automatically saved after conversion.
- Resized Dynamos do convert, however, not all dimensions resize. For example, for a pipe object, you can resize the height and width, but not the thickness of the actual pipe when you resize it if the pipe's ThicknessType is Fixed; this is the case for all pictures with pipes created prior to iFIX 5.0.
- Animations on any object type will map only to an object of the same type.
- Animation Data Sources from an existing Dynamo are maintained as long as a similar object still exists in the Master Dynamo.

- Dynamo descriptions are unique and are not overwritten during a conversion.
- If selected, the "Maintain Caption" option presented on the Dynamo Converter Wizard Progress dialog box retains the caption text in Dynamo Instances only when the object name matches the Master Dynamo.
- Existing connections made via use of Graphical Connection Nodes are maintained whenever possible.

## Using the Dynamo Toolbar

The following table describes the buttons available on the Dynamo Toolbar.

**NOTE:** Although hidden by default, you can access and use toolbars in Ribbon view. To access the Dynamo toolbar in Ribbon view, on the Home tab, in the WorkSpace group, click Settings, and then click Toolbars. You can also open a toolbar from the WorkSpace tree, by opening the Project Toolbar Files folder and double-clicking the toolbar you want to open.

Click this button...	Which can also be accessed in Ribbon view...	To...
	From the Tools tab, in the Dynamos group, click Dynamos, and then click Build Dynamo.	Open the Build Dynamo Wizard. This wizard allows you to create a Dynamo object from a selected object or objects.
	From the Tools tab, in the Dynamos group, click Dynamos, and then click Quick Dynamo Updater.	Open the Quick Dynamo Updater dialog box. This dialog box allows you to find and update Dynamo Instances on all open pictures or on a single active picture.
	From the Tools tab, in the Dynamos group, click Dynamos, and then click Dynamo Updater Wizard.	Open the Dynamo Updater Wizard dialog box. This dialog box allows you to find and update specific Dynamo Instances on selected pictures. You can specify a log file in which to record results.
	From the Tools tab, in the Dynamos group, click Dynamos, and then click Convert Dynamo Sets.	Open the Convert Dynamo Sets dialog box. This dialog box allows you to select Dynamo Sets to convert.
	From the Tools tab, in the Dynamos group, click Dynamos, and then click Quick Dynamo Converter.	Open the Quick Dynamo Converter dialog box. This dialog box allows you to find and convert Dynamo Instances on a single active picture.
	From the Tools tab, in the Dynamos group, click Dynamos, and then click Dynamo Converter Wizard.	Open the Dynamo Converter Wizard dialog box. This dialog box allows you to find and convert specific Dynamo Instances on selected pictures. You can specify a log

file in which to record results.

**NOTE:** The Dynamo Wizard toolbar is not accessible when a Dynamo Set is active.

## Creating Dynamo Objects

To create a Dynamo out of the currently selected object(s), click the Create Dynamo button, shown in the following figure, on the Dynamo toolbar (Classic view) or on the Tools tab, in the Dynamo group, in the Dynamo list, click Create Dynamo (Ribbon view).

If you are creating a Dynamo from an object with no animations, the Build Dynamo Wizard dialog box appears. By default, the Build Dynamo Wizard assigns the object a sequential Dynamo name. In the Build Dynamo Wizard you can rename the Dynamo, as well as enter text describing the Dynamo and the object itself.

When a group containing Dynamo objects is promoted to a Master Dynamo, as in the case when it is dragged and dropped into a Dynamo Set, the contained Dynamo objects (instances) will be converted to standard group objects. A message prompts you about this occurrence, and allows you to cancel the operation.

## Creating Dynamo Objects without Animations

To create a Dynamo out of the currently selected object or objects within a picture, click the Build Dynamo button, shown in the following figure, on the Dynamo toolbar (Classic view) or on the Tools tab, in the Dynamo group, in the Dynamo list, click Build Dynamo (Ribbon view).



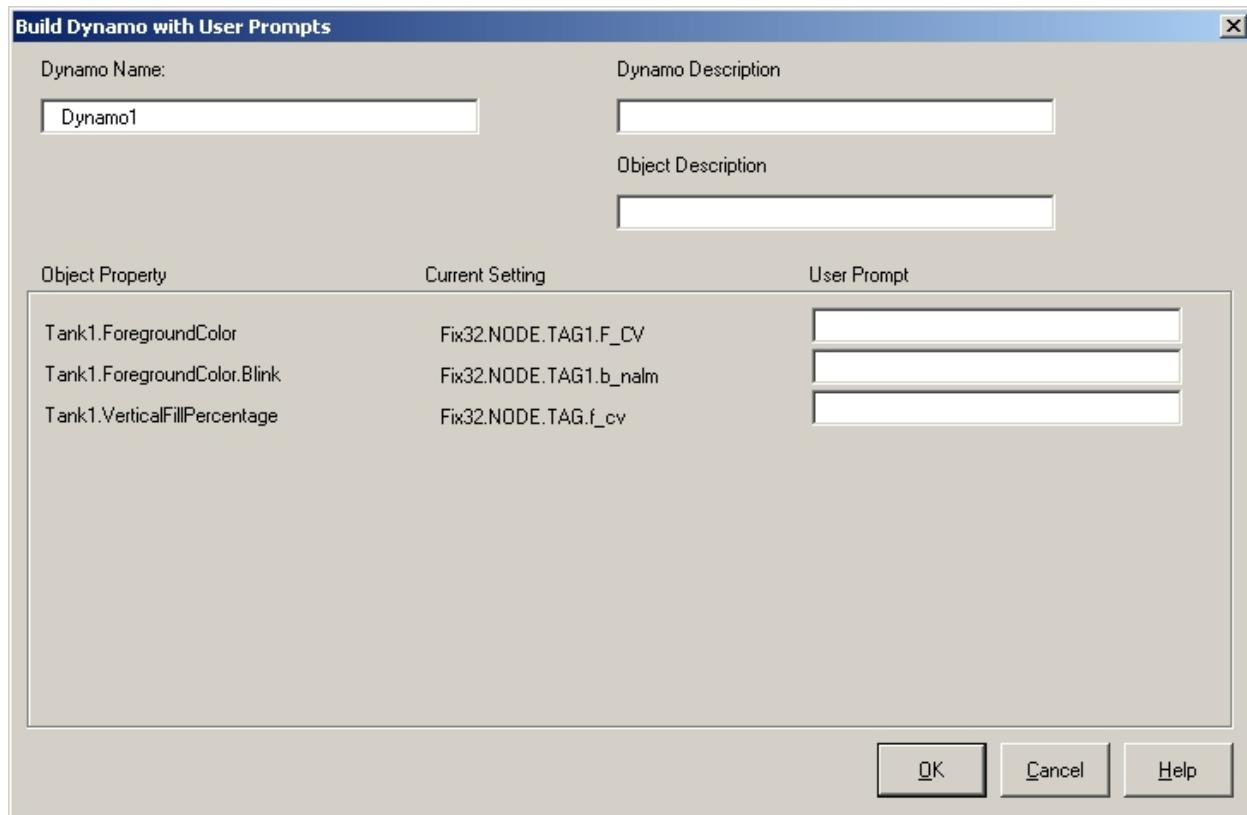
*Build Dynamo Button*

If you are creating a Dynamo from an object with no animations, the Build Dynamo Wizard dialog box appears. By default, the Build Dynamo Wizard assigns the object a sequential Dynamo name. In the Build Dynamo Wizard you can rename the Dynamo, as well as enter text describing the Dynamo and the object itself.

If you are creating a Dynamo object with animations, the Build Dynamo with User Prompts dialog box appears. For more information on how to use this dialog box to create your Dynamo object, refer to the [Creating Dynamo Objects with Animations](#) section.

## Creating Dynamo Objects with Animations

A Dynamo is typically a group of objects that make up a custom object for use in multiple pictures across your system. If some or all of those objects are animated by a data source, the Build Dynamo with User Prompts dialog box appears, as shown in the following figure, when you apply the Build Dynamo wizard to the group.



#### *Build Dynamo with User Prompts Dialog Box*

The object(s) retains the animation properties associated with an object or group when you create the Dynamo object. During Dynamo object configuration, the Build Dynamo with User Prompts dialog box lets you assign meaningful user prompts to Dynamo properties.

For example, if you created a tank with several iFIX objects and used a rectangle as the animated fill portion of the tank, that rectangle is connected to an animation object whose source may be a database tag. Instead of displaying Rect1.VerticalFillPercentage as the animated property in the Dynamo's property dialog box, the Build Dynamo Wizard lets you name Rect1.VerticalFillPercentage to something more meaningful to Dynamo users, like Tank Fill. In this example, you would enter Tank Fill in the User Prompt field.

These user prompts appear in the Dynamo Properties dialog box when the Dynamo is double-clicked or when the Dynamo is first copied into a new picture. This allows you to quickly modify the data source associated with the property, if necessary.

The following sections describe the information displayed in the columns of this dialog box, including:

- [Object Properties](#)
- [Current Setting](#)
- [User Prompts](#)

#### **Object Properties**

The Object Properties column, shown in the [Build Dynamo with User Prompts dialog box](#), displays the objects that comprise the Dynamo object and their animated properties. The basic format for an Object Property is shown below:

`Object Name.Property`

Where Object Name is the name of the object that is animated, and Property is the property of the object that is animated.

You may also have some animated object properties that reside within groups. In this case, the object property displays as shown below:

`Group Name.Object Name.Property`

The following tables describe the properties of objects that you can animate. These properties are all viewed on the Advanced Animations dialog box.

#### Visible Tab

Property	Description	Objects
Visibility	Specifies whether or not a shape appears on the screen.	Time, Date, Rectangle, Rounded Rectangle, Oval, Chord, Polygon, Pie, Pipe, Arc, Line, Polyline, Text, Datalink, Chart, Bitmap

#### Size Tab

Property	Description	Objects
Height	The number of logical units or postscript points occupied by the shape in the vertical direction.	Time, Date, Rectangle, Rounded Rectangle, Oval, Chord, Polygon, Pie, Pipe, Arc, Line, Polyline, Text, Datalink, Chart, Bitmap
Width	The number of logical units or postscript points occupied by the shape in the horizontal direction.	Time, Date, Rectangle, Rounded Rectangle, Oval, Chord, Polygon, Pie, Pipe, Arc, Line, Polyline, Text, Datalink, Chart, Bitmap
HorizontalScalePercentage	The ratio of the current shape width to its original width.	Time, Date, Rectangle, Rounded Rectangle, Oval, Chord, Polygon, Pie, Pipe, Arc, Line, Polyline, Text, Datalink, Chart, Bitmap
VerticalScalePercentage	The ratio of the current shape height to its original height.	Time, Date, Rectangle, Rounded Rectangle, Oval, Chord, Polygon, Pie, Pipe, Arc, Line, Polyline, Text, Datalink, Chart, Bitmap
HorizontalScaleDirection	Specifies whether the left or right side of the shape will expand or contract when the horizontal scale percentage is	Time, Date, Rectangle, Rounded Rectangle, Oval, Chord, Polygon, Pie, Pipe, Arc, Line, Polyline, Text, Datalink, Chart, Bitmap

	changed.	Datalink, Chart, Bitmap
VerticalScaleDirection	Specifies whether the top or bottom side of the shape will expand or contract when the vertical scale percentage is changed.	Time, Date, Rectangle, Rounded Rectangle, Oval, Chord, Polygon, Pie, Pipe, Arc, Line, Polyline, Text, Datalink, Chart, Bitmap
UniformScale	Specifies whether or not a shape scales horizontally and vertically by the same amount.	Time, Date, Rectangle, Rounded Rectangle, Oval, Chord, Polygon, Pie, Pipe, Arc, Line, Polyline, Text, Datalink, Chart, Bitmap

#### Misc Tab

Property	Description	Objects
Layer	The layer of the shape.	Time, Date, Rectangle, Rounded Rectangle, Oval, Chord, Polygon, Pie, Pipe, Arc, Line, Polyline, Text, Command Button, Datalink, Chart
StartX	Specifies the X coordinate starting point of the line.	Chord, Pie, Arc, Line
StartY	Specifies the Y coordinate starting point of the line.	Chord, Pie, Arc, Line
EndX	The horizontal location (in logical units or postscript points) of the last point in the shape.	Chord, Pie, Arc, Line
EndY	The vertical location (in logical units or postscript points) of the last point in the shape.	Chord, Pie, Arc, Line
StartAngle	The angle that starts the sweep of the pie.	Pie
EndAngle	The angle that ends the sweep of the pie.	Pie
Radius	The current radius of the pie.	Pie
Pie Type	Specifies whether the pie is limited to less than 180 degrees of arc.	Pie
MousePointer	Specifies the mouse pointer to display in run mode.	Command Button
Accelerator	Specifies the accelerator to use in run mode.	Command Button
Name	Specifies the name of the object.	Command Button, Alarm Summary
IsSelectable	Controls whether the object can be selected in run mode.	Command Button, Alarm Summary
Description	A user defined description of	Command Button, Alarm

ContextID	this object's function. The user-defined context ID for Command Button, Alarm the user's context sensitive help file.	Summary
Visible	Specifies whether or not a shape appears on the screen.	Command Button, Alarm Summary
Height	The number of logical units or postscript points occupied by the shape in the vertical direction.	Command Button, Alarm Summary
Width	The number of logical units or postscript points occupied by the shape in the horizontal direction.	Command Button, Alarm Summary
HorizontalPosition	The shape's distance (in logical units or postscript points) from the left side of the picture.	Command Button, Alarm Summary
VerticalPosition	The shape's distance (in logical units or postscript points) from the top of the picture.	Command Button, Alarm Summary
HorizontalScalePercentage	The ratio of the current shape width to its original width.	Command Button, Alarm Summary
VerticalScalePercentage	The ratio of the current shape height to its original height.	Command Button, Alarm Summary
HorizontalScaleDirection	Specifies whether the left or right side of the shape will expand or contract when the horizontal scale percentage is changed.	Command Button, Alarm Summary
VerticalScaleDirection	Specifies whether the top or bottom side of the shape will expand or contract when the vertical scale percentage is changed.	Command Button, Alarm Summary
UniformScale	Specifies whether or not a shape scales horizontally and vertically by the same amount.	Command Button, Alarm Summary
EnableToolips	Specifies whether a shape's tooltips are shown.	Command Button, Alarm Summary
ControlOrderIndex	The order in which this object will be selected via the up and down arrow keys.	Command Button, Alarm Summary
HighlightEnabled	Indicates that the button should have a highlight rectangle drawn around it when the mouse passes over it in run mode.	Command Button, Alarm Summary

Default	Specifies whether the button is Command Button, Alarm the default button on the pic- ture.	Summary
Cancel	Specifies the ability of the but- ton to accept the cancel event on the picture.	Command Button, Alarm Summary
EnableAlarmAcknowledge	Specifies whether or not alarm acknowledgement is enabled.	Alarm Summary
EnableAlarmDeletion	Specifies whether or not alarm deletion is enabled.	Alarm Summary
EnableColumnQuickSort	Specifies whether or not column quick sort is enabled.	Alarm Summary
FilterString	Specifies the filter string.	Alarm Summary
ShowHeaders	Specifies whether or not to dis- play the column headers.	Alarm Summary
ShowRowNumbers	Specifies whether or not to dis- play row numbers.	Alarm Summary
UseUnacknowledgeAlarmColor	Specifies whether or not to dis- play a color for unac- knowledged alarms.	Alarm Summary
ShowScrollBars	Specifies whether or not to dis- play scroll bars.	Alarm Summary
SortColumnName	Specifies the column name to sort by.	Alarm Summary
SortOrderDescending	Specifies whether or not the descending sort type is enabled.	Alarm Summary
AlarmUserdefField1	Specifies the User Defined Field 1 property.	Alarm Summary
AlarmUserdefField2	Specifies the User Defined Field 2 property.	Alarm Summary
EnableRightMouseClick	Specifies whether or not the right mouse menu is enabled.	Alarm Summary
BlinkEnabled	Specifies whether or not the blink property is enabled.	Alarm Summary
ShowGridLines	Specifies whether or not the grid lines are displayed.	Alarm Summary
UnacknowledgedAlarmColor	Specifies the color to display for unacknowledged alarms.	Alarm Summary
EnableRunTimeConfiguration	Specifies whether or not run- time configuration is enabled.	Alarm Summary
UpdateOnPropChange	Specifies whether or not to update when property values change.	Alarm Summary
ShowStatusBar	Specifies whether or not the status bar is displayed.	Alarm Summary
AlarmRefreshInterval	Specifies the alarm refresh interval in seconds.	Alarm Summary
BlinkRate	Specifies the rate, in seconds,	Alarm Summary

SelectionTimeout	Specifies the length of time, in seconds, that a row remains selected.	
StatusFontSize	Specifies the font size of the alarm status text.	Alarm Summary
PauseIndicatorBlink	Specifies whether or not the pause status color blinks.	Alarm Summary
PauseIndicatorColor	Specifies the color of the pause status.	Alarm Summary
PauseWithNewAlarmIndicatorBlink	Specifies whether or not the pause alarm status color blinks.	Alarm Summary
PauseWithNewAlarmIndicatorColor	Specifies the color of the pause alarm status.	Alarm Summary
RunIndicatorBlink	Specifies whether or not the run status color blinks.	Alarm Summary
RunIndicatorColor	Specifies the color of the run status.	Alarm Summary
UserDef1ColumnName	Specifies the name of the User Defined Field 1 property.	Alarm Summary
UserDef2ColumnName	Specifies the name of the User Defined Field 2 property.	Alarm Summary
BackgroundColor	Specifies the background alarm color.	Alarm Summary
AlarmHornEnabled	Specifies whether or not the alarm horn is enabled.	Alarm Summary
VisibleUnacknowledgedAlarms	Specifies whether or not unacknowledged alarms are displayed.	Alarm Summary
TotalFilteredAlarms	Specifies the total number of filtered alarms.	Alarm Summary
CheckForNewAlarms	Specifies whether or not to check for new alarms.	Alarm Summary
TopVisibleRow	Specifies the number of top rows that are visible.	Alarm Summary
BottomVisibleRow	Specifies the number of bottom rows that are visible.	Alarm Summary
CheckForAlarmListChanged	Specifies whether or not to check if the alarm list has changed.	Alarm Summary
EnableAcknowledgeAll	Specifies whether or not the Allow Acknowledge All Alarms property is enabled.	Alarm Summary
CurrentImage	Specifies the index of the image currently displayed.	Bitmap
ApplyProperties	Specifies how the properties are applied to the list of images.	Bitmap

ButtonStyle	Specifies the button behavior of the bitmap.	Bitmap
ButtonState	Specifies the state of a multi-state button.	Bitmap
SecondaryImageDisplayed	Specifies whether or not a secondary image at the current index is being displayed as the primary (or mouse-up) image.	Bitmap
DownImageDisplayed	Specifies whether or not the secondary image is to be displayed on a mouse down.	Bitmap
Transparency	Specifies whether or not a bitmap can effectively have a bleed-through area that can be used for animation and visualization.	Bitmap

#### Position Tab

Property	Description	Objects
HorizontalPosition	The shape's distance (in logical units or postscript points) from the left side of the picture.	Time, Date, Rectangle, Rounded Rectangle, Oval, Chord, Polygon, Pie, Pipe, Arc, Line, Polyline, Text, Datalink, Chart, Bitmap
VerticalPosition	The shape's distance (in logical units or postscript points) from the top of the picture.	Time, Date, Rectangle, Rounded Rectangle, Oval, Chord, Polygon, Pie, Pipe, Arc, Line, Polyline, Text, Datalink, Chart, Bitmap

#### Color Tab

Property	Description	Objects
ForegroundColor	The color used to fill the interior of the shape.	Time, Date, Rectangle, Rounded Rectangle, Oval, Chord, Polygon, Pie, Pipe, Text, Datalink, Chart
BackgroundColor	The color used to fill in the interior of the shape.	Time, Date, Rectangle, Rounded Rectangle, Oval, Chord, Polygon, Pie, Pipe, Text, Datalink, Chart, Bitmap
EdgeColor	The color used to outline the shape.	Time, Date, Rectangle, Rounded Rectangle, Oval, Chord, Polygon, Pie, Pipe, Arc, Line, Polyline, Text, Datalink, Chart
ForegroundEdgeColor	The foreground edge color of a Chart shape.	Chart
BackgroundEdgeColor	The background edge color of	Chart

HorizontalGridColor	a shape. The color of the horizontal grid lines.
VerticalGridColor	The color of the vertical grid lines.
TransparentColor	The transparent color of the bitmap map.

#### Style Tab

Property	Description	Objects
FillStyle	The pattern used to fill the interior of the shape.	Time, Date, Rectangle, Rounded Rectangle, Oval, Chord, Polygon, Pie, Pipe, Text, Datalink, Chart
BackgroundStyle	Specifies whether the fill style is either a "visible" or "see through" background.	Time, Date, Rectangle, Rounded Rectangle, Oval, Chord, Polygon, Pie, Pipe, Arc, Line, Polyline, Text, Datalink, Bitmap
EdgeStyle	The pattern used to outline the object.	Time, Date, Rectangle, Rounded Rectangle, Oval, Chord, Polygon, Pie, Pipe, Arc, Line, Polyline, Text, Datalink, Chart, Bitmap
EdgeWidth	The width (in pixels) of the object's outline.	Time, Date, Rectangle, Rounded Rectangle, Oval, Chord, Polygon, Pie, Pipe, Arc, Line, Polyline, Text, Datalink, Chart
RoundnessX	Specifies the horizontal roundness of the rounded rectangle.	Rounded Rectangle
RoundnessY	Specifies the vertical roundness of the rounded rectangle.	Rounded Rectangle
Thickness	Specifies the thickness (in pixels) of the pipe object.	Pipe
StartCap	Specifies the style to use for the start cap of the pipe object.	Pipe
EndCap	Specifies the style to use for the end cap of the pipe object.	Pipe
ElbowStyle	Specifies the style to use for the elbow of the pipe object.	Pipe
FontSize	Specifies the font size used to display text.	Chart
FontName	Specifies the font family used to display text.	Chart

FontStyle	Specifies the style of font used to display text.	Chart
Transparent	Specifies whether or not the chart is transparent.	Chart
MultipleEGU	Specifies whether or not the chart displays multiple EGUs.	Chart
MultipleTimes	Specifies whether or not the chart displays multiple times.	Chart
ShowLegend	Show/hides the chart legend.	Chart
ShowTimeAxis	Specifies whether or not to display the time axis.	Chart
ShowValueAxis	Specifies whether or not to display the value axis.	Chart
ShowTimeCursor	Specifies whether or not to display the time cursor.	Chart
BackgroundEdgeStyle	Specifies the background edge style of the shape.	Chart
ForegroundEdgeStyle	Specifies the foreground edge style of the shape.	Chart
ForegroundEdgeWidth	Specifies the width of the shape's foreground border.	Chart
BackgroundEdgeWidth	Specifies the width of the shape's background border.	Chart
ShowTimecursorToolTips	Specifies whether to show the time cursor tool tips.	Chart
TimeCursorColor	Specifies the time cursor color.	Chart
ShowHorizontalGrid	Shows/hides the horizontal grid lines.	Chart
ShowVerticalGrid	Shows/hides the vertical grid lines.	Chart
HorizontalGridStyle	Specifies the style of the horizontal grid lines.	Chart
VerticalGridStyle	Specifies the style of the vertical grid lines.	Chart
GridWidth	Specifies the width of the grid lines.	Chart
NumberOfHorizontalGridLines	Specifies the number of horizontal grid lines.	Chart
NumberOfVerticalGridLines	Specifies the number of vertical grid lines.	Chart
ShowDate	Specifies whether or not to show the date.	Chart
TimeAxisTitle	Specifies the title of the time axis.	Chart
ValueAxisTitle	Specifies the title of the value axis.	Chart

TimeAxisNumTicks	Specifies the number of ticks on the time axis.	Chart
TimeAxisNumLabels	Specifies the number of labels on the time axis.	Chart
ValueAxisNumTicks	Specifies the number of ticks on the value axis.	Chart
ValueAxisNumLabels	Specifies the number of labels on the value axis.	Chart
ShowTimeAxisTitle	Specifies whether or not to show the time axis title.	Chart
ShowValueAxisTitle	Specifies whether or not to show the value axis title.	Chart

#### Rotate Tab

Property	Description	Objects
RotationAngle	The angle (in radians or degrees) by which the shape has been rotated since its creation.	Rectangle, Chord, Polygon, Pie, Pipe, Arc, Line, Polyline
AngleUnits	Specifies whether the angles are measured in degrees or radians.	Rectangle, Chord, Polygon, Pie, Pipe, Arc, Line, Polyline

#### Text Tab

Property	Description	Objects
Caption	Specifies the displayed text.	Time, Date, Text, Datalink
FontName	Specifies the font family used to display text.	Time, Date, Text, Datalink
FontSize	Specifies the font size used to display text.	Time, Date, Text, Datalink
FontStyle	Specifies the font style used to display text.	Time, Date, Text, Datalink

#### Behavior Tab

Property	Description	Objects
AutoSize	Controls whether the text object automatically picks a new font that will fit into the bounding rectangle as the caption changes.	Time, Date, Text, Command Button, Datalink
ScalesWidth	Specifies whether the width of the text or datalink object can be changed.	Time, Date, Text, Datalink
MaxLines	Specifies the maximum number of text lines allowed.	Time, Date, Text, Datalink
MaxCharactersPerLine	Specifies the maximum number of characters allowed per line.	Time, Date, Text, Datalink

Alignment	Specifies the alignment of the Datalink text string within the text's bounding rectangle.	
StrikeThrough	Specifies whether the text has Time, Date, Text, Datalink a strike through it.	
Enabled	Specifies whether or not the command button is enabled.	Command Button
Locked	Specifies whether or not the command button is locked.	Command Button
WordWrap	Specifies whether or not the text displayed on the command button wraps.	Command Button
RefreshRate	Specifies the refresh rate of the chart.	Chart
CurrentPen	Specifies the current pen.	Chart
Timeout	Specifies the amount of time to pause for.	Chart
ScrollDirection	Specifies the direction to scroll.	Chart
ResetPercentage	Specifies the chart's reset percentage.	Chart
ScrollPercentage	Specifies the chart's scroll percentage.	Chart
ZoomDirection	Specifies the direction in which to zoom.	Chart
StartDateMode	Specifies the start date mode.	Chart
DaysBeforeNow	Specifies the number of days before now that will be included in the chart.	Chart
StartTimeMode	Specifies the start time mode.	Chart
TimeBeforeNow	Specifies the amount of time before now to use in the chart.	Chart
Duration	Specifies the time duration.	Chart
Interval	Specifies the length of time between intervals.	Chart
ScrollGrid	Specifies the scroll grid mode.	Chart
TimeZoneBiasExplicit	Specifies the explicit time zone bias.	Chart
TimeZoneBiasRelative	Specifies the relative time zone bias.	Chart
DaylightSavingsTime	Specifies whether to use Daylight Savings Time when displaying data.	Chart
LockStartTime	Specifies whether or not to lock the start time.	Chart
IntervalMilliseconds	Specifies the millisecond component of the interval.	Chart
AutoUpdateRate	Specifies the auto-update rate.	Chart

DisplayMilliseconds	Specifies whether or not to display milliseconds.
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#### Gradient Tab

Property	Description	Objects
FadeColor	Specifies the fade color used for the gradient fill.	Time, Date, Rectangle, Rounded Rectangle, Oval, Chord, Polygon, Pie, Pipe, Text, Datalink, Chart
FadeType	Specifies the fade type used for the gradient fill.	Time, Date, Rectangle, Rounded Rectangle, Oval, Chord, Polygon, Pie, Text, Datalink, Chart
GradientAngle	Specifies the angle of the shape's gradient fill.	Time, Date, Rectangle, Rounded Rectangle, Oval, Chord, Polygon, Pie, Text, Datalink, Chart
Blend	Specifies the blend percentage used for the gradient fill.	Time, Date, Rectangle, Rounded Rectangle, Oval, Chord, Polygon, Pie, Pipe, Text, Datalink, Chart

#### Fill Tab

Property	Description	Objects
HorizontalFillPercentage	The percentage of the shape's interior that will be filled horizontally with color and pattern, starting at the location identified by the HorizontalFillDirection.	Rectangle, Rounded Rectangle, Oval, Chord, Polygon, Pie, Pipe, Bitmap
VerticalFillPercentage	The percentage of the shape's interior that will be filled vertically with color and pattern, starting at the location identified by the VerticalFillDirection.	Rectangle, Rounded Rectangle, Oval, Chord, Polygon, Pie, Pipe, Bitmap
HorizontalFillDirection	Specifies the direction of a shape's horizontal fill.	Rectangle, Rounded Rectangle, Oval, Chord, Polygon, Pie, Pipe, Bitmap
VerticalFillDirection	Specifies the direction of a shape's vertical fill.	Rectangle, Rounded Rectangle, Oval, Chord, Polygon, Pie, Pipe, Bitmap

#### Appearance Tab

Property	Description	Objects
BackColor	Specifies the background color of the command button.	Command Button
BackStyle	Specifies the background style of the command button.	Command Button
Caption	Specifies the text to be displayed on the command button.	Command Button

ForeColor	Specifies the foreground color of the command button.	Command Button
-----------	---	----------------

#### Picture Tab

Property	Description	Objects
PicturePosition	Specifies the position of the picture.	Command Button

#### Variable Tab

Property	Description	Objects
VariableType	Specifies the variable type.	Local Variable
InitialValue	Specifies the initial value of the variable.	Local Variable
CurrentValue	Specifies the current value of the variable.	Local Variable
Source	Specifies the source string for an animation.	Global Variable
GlobalToggle	The source of data for triggering a "GlobalOutputToggle" setting that will alternate with the actual setting from the lookup table.	Global Variable
ToggleSource	Specifies the data source or expression used to determine if the output of the Lookup object should toggle between output1 and output2.	Global Variable

#### Current Setting

The Current Setting column, shown in the [Build Dynamo with User Prompts Dialog Box](#), displays the source or data source currently assigned to the associated object property.

For example, you create a tank that is made up of a group of rectangles and you assign the VerticalFillPercentage of the interior rectangle, RectInt, with the data source FIX32.NODE.TAG.FIELD. When you select the tank group and apply the Build Dynamo Wizard, FIX32.NODE.TAG.FIELD appears in the Current Setting column for the RectInt.VerticalFillPercentage object property.

In addition to representing the data source of an animated property, the current setting column may also display text for a text object.

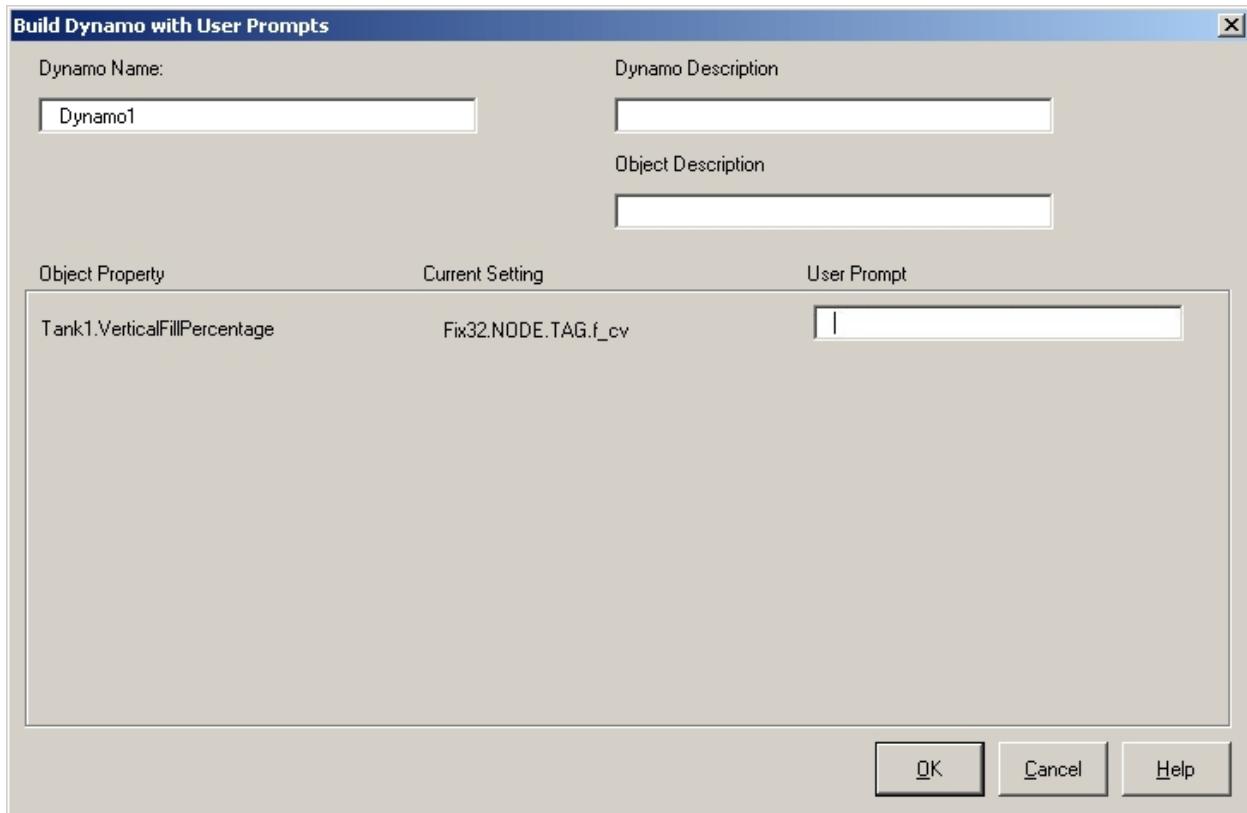
The Dynamo user can change the current setting when he places the Dynamo in a picture or double-clicks it.

#### User Prompts

The User Prompts column in the Build Dynamo with User Prompts dialog box, shown in the following figure, allows you to enter prompts for Dynamo properties.

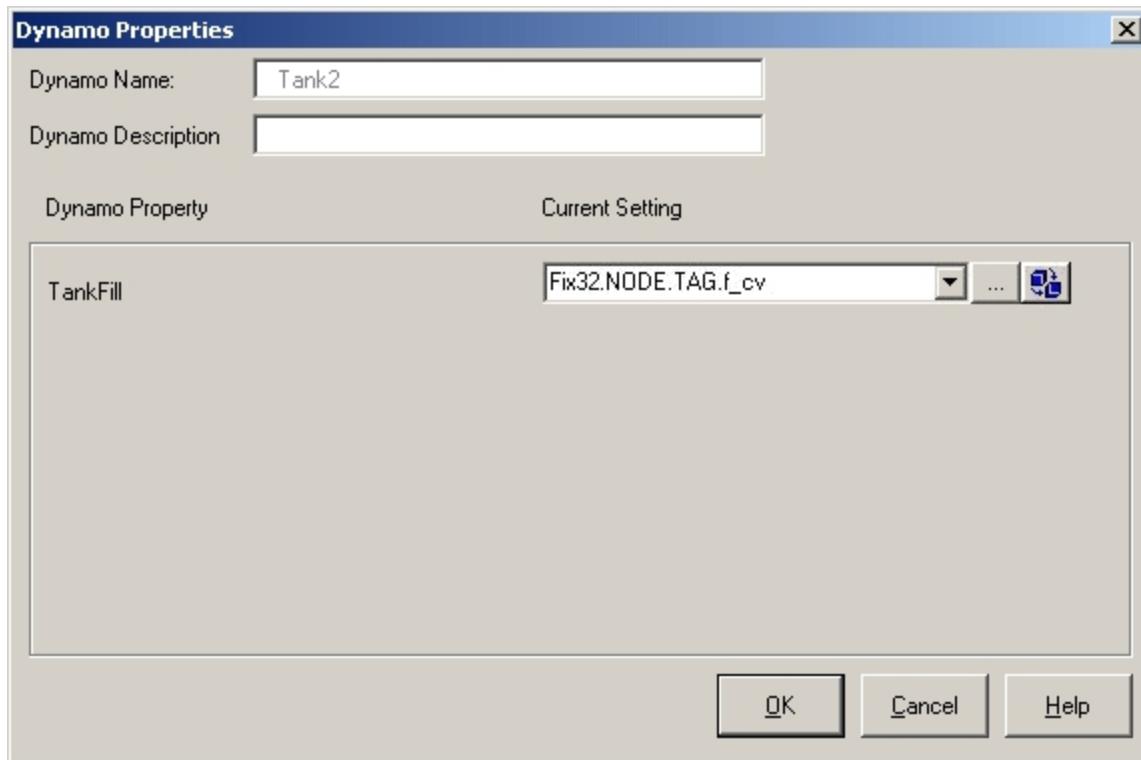
These user prompts appear in the Dynamo Properties dialog box when the Dynamo is double-clicked or when the Dynamo is first copied into a new picture. This allows you to quickly modify the data source associated with the property.

For example, if you create the tank described in the [Current Setting](#) section and apply the Build Dynamo Wizard, the Build Dynamo with User Prompts dialog box appears as shown in the following figure.



*Build Dynamo with User Prompts Dialog Box - Entering User Prompts*

In this example, enter Tank Fill in the User Prompt field. Tank Fill describes the property for the Dynamo. Tank Fill is more descriptive to users than RectInt.VerticalFillPercentage. The Dynamo properties display, as shown in the following figure, if the user double-clicks the Dynamo.



*Dynamo Properties Dialog Box*

### Using Partial Substitution for Dynamo User Prompts

You can configure a Dynamo to allow partial substitution for property values. For example, you may want to allow the user to enter a different NODE.TAG for a Dynamo property value but keep a static field. To do this, you need to enter the User Prompt surrounded by brackets and use asterisks for static values.

**IMPORTANT:** When using tag group symbols as partial substitutions, the Build Dynamo Wizard does not automatically resolve the tags.

The following example illustrates how you might use partial substitution for a Dynamo's property setting.

#### Example: Using Partial Substitution for Dynamo User Prompts

This example assumes that you have a datalink named Datalink1 in the group of objects that you are converting to a Dynamo. In the Build Dynamo with User Prompts dialog box, enter the User Prompt as shown below:

Object Property	Current Setting	User Prompt
Datalink1.Caption	FIX32.SCADA01.TL01.F_CV	{Measurement Tag}.*

The Dynamo Properties dialog box displays the following:

<b>DynamoProperty</b>	<b>CurrentSetting</b>
Measurement Tag	FIX32.SCADA01.TL01

The Dynamo property Measurement Tag always uses the F\_CV field for any tag the user enters.

## Assigning the Same User Prompt for Multiple Object Properties

In some cases, you may want all of the Dynamo object properties to use the same setting. For example, you may want a tank's fill and color properties to be animated by the same database tag. To do this, enter the same User Prompt for each object property.

If you use the same user prompt for multiple Dynamo properties, when you view the Dynamo Property dialog box, only one property displays. The value entered for the Dynamo property is used for all the object properties that you assigned that user prompt to.

### Example: Assigning the Same User Prompt for Multiple Object Properties

In this example, you create a Dynamo that allows the user to enter one tag that animates both the vertical fill percentage and the foreground color of Rect1. In the Build Dynamo with User Prompts dialog box, enter the User Prompt as shown below:

Object Property	Current Setting	User Prompt
Rect1.VerticalFillPercentage	FIX32.NODE.TAG.FIELD	Tank Animation Tagname
Rect1.ForegroundColor	FIX32.NODE.TAG.FIELD	Tank Animation Tagname

The Dynamo Properties dialog box displays the following:

Dynamo Property	Current Setting
Tank Animation Tagname	FIX32.NODE.TAG.FIELD

When you enter a different tag in the Current Setting column, the tag animates both the fill percentage and color.

## Displaying No User Prompts for a Dynamo Object with Animations

In some cases, you may not want to display any user prompts for an object that contains animations. For example, you may have a complex Dynamo object with user prompts provided through scripting, rather than manual user entry. To allow for this, in the Build Dynamo User Prompt dialog box, do not enter a user prompt in any object property. Leave all user prompt fields empty.

If you do not enter user prompts in any of the object property fields of the Build Dynamo User Prompt dialog box, then no prompts display when you add the Dynamo Instance to a picture.

## Creating Custom Dynamo Objects with Command Scripts

When you create a Dynamo object that contains objects with command scripts, you can apply user prompts to those scripts allowing users of the Dynamo to change the command script parameter. To do this, for each command script, add a Variable object to the Dynamo group and change the command script parameter as described in the example below. This allows you to change the command script parameter in the Dynamo Properties dialog box.

### Example 1

For example, you may want to create a Dynamo that contains a command button that when clicked, runs the following command script:

```
ToggleDigitalPoint "FIX32.SCADA01.D01.F_CV"
```

And, you may want to allow the Dynamo users to change the tagname for the ToggleDigitalPoint command.

► To allow Dynamo users to change the tagname for the ToggleDigitalPoint command:

1. Add a Variable object for each command script to the Dynamo group.
2. Set the Variable object's VariableType property to String and its InitialValue property to the tagname.
3. Change the command script parameter in the script to *VariableName*.InitialValue.

## Example 2

Assume that you have two push buttons in your Dynamo. One has the command script: WriteValue "50", "FIX32.NODE.TAG.F\_CV". The other has the following command script: ToggleDigitalPoint "FIX32.NODE.DIGTAG.F\_CV".

► To allow users to be able to set the tags when they use the Dynamo object:

1. In Classic view, use the Variable toolbar button on the Toolbox to insert a Variable object.  
-Or-  
In Ribbon view, on the Insert tab, in the Objects/Links group, click Objects/Links, and then click Variable.
2. When the Create a Variable Object dialog box appears:
  - a. Name the Variable object WriteVal.
  - b. Select Variable Type String.
  - c. Select Local Variable.
  - d. Click OK.
3. Select the Variable object that you inserted in the System Tree, and select Property Window from the right-click menu.
4. In the Property Window for the Variable object, set the Initial Value property to FIX32.NODE.TAG.F\_CV.
5. Insert another Variable object and follow steps 1 through 4 above. Name the Variable object ToggleVal and set the Initial Value property of this Variable object to FIX32.NODE.DIGTAG.F\_CV.
6. For the two pushbuttons, open the Visual Basic Editor and change the command scripts as follows:
  - WriteValue "50", WriteVal.InitialValue
  - ToggleDigitalPoint ToggleVal.InitialValue
7. Close the editor and add the two Variable objects to the Dynamo group by selecting them in the System Tree and dragging and dropping them into the group.

When you select the Create Dynamo toolbar button, the Create Dynamo with User Prompts displays:

Object Property	Current Settings	User Prompt
WriteVal.InitialValue	FIX32.NODE.TAG.F_CV	
ToggleVal.InitialValue	FIX32.NODE.DIGTAG.F_CV	

If you set your User Prompts to Write Tag and Toggle Tag, the Dynamo Properties dialog box displays the following:

Dynamo Property	Current Setting
Write Tag	FIX32.NODE.TAG.F_CV
Toggle Tag	FIX32.NODE.DIGTAG.F_CV

## Building Custom Dynamos with VBA

iFIX Dynamo objects are powerful tools, especially because they let you customize your display using VBA. When a Dynamo fires an Edit event, you can customize that Dynamo using VBA scripts. Specifically, you can modify custom property pages, apply animations in real-time, or hide code for animations into an empty user form. You can place user forms into a global page so that every time you open that Dynamo, the format for a particular property page is shared among several users.

For more information on using VBA to customize Dynamos for your specific needs, refer to the [Writing Scripts](#) manual.

## Creating Dynamo Sets

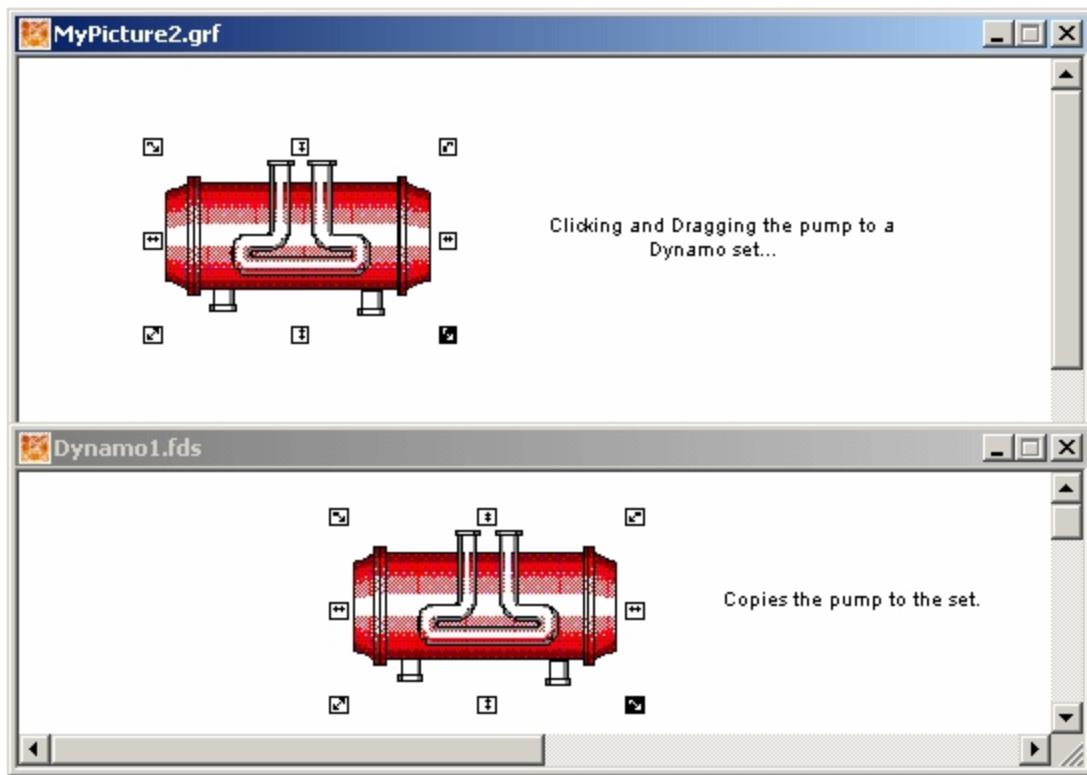
A Dynamo Set is a collection of Dynamos. Dynamo Sets are saved in iFIX with a .FDS file extension. Each set can include Dynamo objects, pre-built Dynamos, and Dynamos groups created before iFIX 4.5. iFIX contains an extensive library of pre-built Dynamo Sets that you can use, or you can create your own.

**NOTE:** Dynamos in Pre-built Dynamo Sets earlier than iFIX 4.5 and Dynamos created before iFIX 4.5 are not Dynamo objects. This means you cannot use the Quick Dynamo Updater, the Dynamo Updater Wizard, and the Cross Reference Tool to update instances of pre-built Dynamos or Dynamos created earlier than iFIX 4.5 within existing pictures. Only Dynamo objects can be updated with these tools. However, you may convert Dynamos created before iFIX 4.5 to objects using the Dynamo Converter tools. After the Dynamos have been converted, you may then use the Quick Dynamo Updater, the Dynamo Updater Wizard, and the Cross Reference Tool to update Dynamo instances.

To open an existing Dynamo Set in the iFIX WorkSpace, open the Dynamo Sets folder from the system tree and double-click the set.

To create a new Dynamo Set, click the New Dynamo Set button on the Standard toolbar (Classic view) or on the Tools tab, in the Dynamos group, in the Dynamos set, click New Dynamo Set (Ribbon view). A blank document opens always on top and half the window size, and the Dynamo Set is added to the Dynamo Sets folder in the system tree. When you save a Dynamo Set, it is given an .FDS extension and stored in this folder.

To accommodate the unique requirements of Dynamo objects, objects behave slightly different in a Dynamo Set than they do in a picture. For example, when you click an object in a picture and drag that object to another location within the picture, you move the object. However, if you drag and drop that same object into a Dynamo Set, you copy the Dynamo object to the set, as the following figure shows.



### *An Object Moved within a Picture*

**IMPORTANT:** Be advised that if you delete a Master Dynamo and there are pictures with Dynamo Instances derived from that Master Dynamo, the links to those Instances will be lost when the Master Dynamo is deleted. Use caution when deleting any Master Dynamo in a Dynamo Set.

### Dynamo Behavior in Pictures and in Sets

If you create an object, and then copy the object to a Dynamo Set, you can access the Visual Basic Editor by double-clicking the new Dynamo. If you make changes in the Visual Basic Editor however, and then copy the Dynamo back into a picture, you cannot double-click the object to display the Animations dialog box. This is because an Edit event created in a Dynamo overrides the double-click behavior in the picture.

### Right-click Menu for Dynamo Set Objects

Many of the operations you can perform with Dynamos can be accessed using the Dynamo's right-click pop-up menu. When you want to make any modifications to your Dynamo Sets, you can use this menu. To access the pop-up menu, right-click the object in the Dynamo Set. The following table describes which functions are available and what they help you do.

**Dynamo Set Pop-up Menu Selections**

Use the operation...	To...
Undo	Undo an operation.
Cut	Remove the object from the dynamo and place it into the clipboard.
Copy	Create a duplicate copy of the object and place it into the clipboard.
Delete	Remove the object from the dynamo.

Duplicate	Create a duplicate copy of the object and place it slightly offset from the original.
Edit Script	Open the Visual Basic Editor, which allows you to edit Visual Basic scripts.
Property Window	Display the Properties Window, which allows you to view and change property values.

## Using a Dynamo Object in Pictures

After you create a Dynamo and save it in a Dynamo Set, you can use it in your system pictures by dragging the Dynamo from the Dynamo Set into a picture. A Dynamo is not a Master Dynamo, and therefore not linked to other Dynamos, until it becomes part of a Dynamo Set. Once it's part of a Dynamo Set, any instances created beforehand are not linked to the Master Dynamo. Only Instances created after the Dynamo becomes part of the Dynamo Set are linked to the Master Dynamo.

If you assigned User Prompts to the Dynamo's Object Properties, the Dynamo Properties dialog box appears after you drop in the Dynamo object. This dialog box allows you to change the data sources for the Dynamo's properties.

## Updating Dynamo Objects in Pictures

You can search for Dynamo Instances and replace them in multiple pictures at once with the latest versions of their associated Master Dynamos using the Dynamo Updater. The Dynamo Updater is accessed using either the Quick Dynamo Updater or the Dynamo Updater Wizard, both of which are available from the Dynamo Toolbar (Classic view) or on the Tools tab, in the Dynamos group, in the Dynamos list (Ribbon view). The Dynamo Updater can also be accessed from the Tool menu of the Cross Reference Tool.

In general, when updating a Dynamo Instance inside a Picture, that Instance is replaced with the Master Dynamo it is being updated from. This replacement is not a merge; if you have made changes to the Dynamo Instance, it is overwritten by the Master Dynamo.

### Limitations

There are a few limitations when using the Dynamo Updater tool:

- The Quick Dynamo Updater and Dynamo Updater Wizard do not support dynamos with Enhanced Charts.
- Pictures in a shared directory that are currently open by another user are not available to be updated. A picture must be able to be opened and saved, which requires that no one else have the file open.
- If you rotated an instance of a Master Dynamo object within a picture, you must review the Dynamo Instance and modify it after the update.
- Resized Dynamos do update, however, not all dimensions resize. For example, for a pipe object, you can resize the height and width, but not the thickness of the actual pipe when you resize it.
- Animations on any object type will map only to an object of the same type.

- Animation Data Sources from an existing Dynamo Instance are maintained as long as a similar object still exists in the Master Dynamo.
- Dynamo descriptions are unique to the Instance and are not overwritten during an update.
- Existing connections made via use of Graphical Connection Nodes are maintained whenever possible.
- It is possible for you to have changed a Master Dynamo so significantly that it is impossible to perform an update and maintain all the data.

For example, if you update a Dynamo to contain only one data source based animation but a previous version had three data source based animations, a best guess match is made about which one of the three data sources to use. A report is then generated based on your settings. The "best guess" approach makes comparisons between common properties. For example, a Fill Animation's data source is copied over only to another Fill Animation. If no Fill Animation exists, the data source is likely to be dropped. For multiple Fill Animations, additional comparisons such as the Animation Name are made.

## Searching for Mismatched Dynamo Instances

There are three ways to search for Dynamo Instances whose versions do not match their Master Dynamos:

- The Quick Dynamo Updater lets you conduct a basic search for Dynamo Instances that are not synchronized with their associated Master Dynamos in the active picture or all open pictures.
- The Dynamo Updater Wizard gives you finer control over which Dynamos and pictures to include in the search, lets you specify a log file in which to record search results, and enables you to specify the update behavior that the Dynamo Updater should use during the replacement process.
- The Cross Reference Tool's Report Wizard enables you to search for Dynamos in pictures, or pictures containing specified Dynamos.

## Updating Mismatched Dynamo Instances

If you have found mismatched Dynamo Instances using the Quick Dynamo Updater, Dynamo Updater Wizard, or Cross Reference Tool Report Wizard, you can update them with the Dynamo Updater. In the Dynamo Updater, you can configure whether iFIX prompts when or if the updates occur.

The Dynamo Updater examines the version differences between Dynamo Instances and their associated Master Dynamos, and then updates the Dynamo Instances based on the update behavior you specify.

## Changing the Configuration of a Dynamo

If you need to modify the configuration of an existing Dynamo object in a picture (a Dynamo Instance), right-click the Dynamo object and select Enter Drill-down. A box appears around the Dynamo object. Select the object you want to make changes to, and update it. Click outside the selected box when you are finished with your changes.

You can also select the Dynamo object and click the Build Dynamo button on the Dynamo Toolbar to update Dynamo user prompts (Classic view) or on the Tools tab, in the Dynamos group, in the Dynamos list, click Build Dynamo (Ribbon view).

Additionally, you can right-click the Dynamo object and select Property Window to update overall properties in the Dynamo.

If you want to modify a Master Dynamo in a Dynamo Set, drag the Dynamo object from the Dynamo Set and into a picture and make your changes. When you are finished, drag-and-drop the Dynamo object from the picture, back into the Dynamo Set. A message appears asking you if you want to overwrite the Master Dynamo and update it. While you can also edit some Dynamo Properties from the Dynamo Set window, it's better to drag-and-drop the Dynamo into a picture to make the update and then drag-and-drop it back into the Dynamo set. Ensure that you remove the updated Dynamo object from the picture and replace it with an instance of the Master Dynamo, and then you can update other instances of Dynamo objects.

## Modifying Dynamo Object Properties

The Dynamo Properties dialog box appears when a Dynamo is double-clicked or when the Dynamo is first copied into a new picture, and there are user prompts available for the Dynamo. This dialog box allows you to quickly modify the data source associated with the property, if necessary. The Dynamo Properties dialog box includes the Dynamo properties listed below:

Property	Description
Dynamo Name	A read-only field listing the name of the Dynamo object. You cannot edit this field.
Dynamo Description	A description of the specific usage of the given Dynamo Instance. The maximum number of characters that you can enter in this description are recorded in the <a href="#">Max_Dynamo_Desc_Length</a> field. The Dynamo Description can be different for each Dynamo Instance. For the Master Dynamo, the description is empty and read-only.
Dynamo Property	If the Dynamo contains animated properties, the Dynamo Properties dialog box displays the animated properties and lets you change their current setting.
Current Setting	Each property contains a Current Setting column. The Current Setting column contains the value or data source assigned to the Dynamo property. The first time you use the Dynamo, it displays the original values assigned to the properties when the Dynamo was created.  If the current setting is a data source, you can select the Browse (...) button to launch the Expression Builder and select a new data source. You can also select the Quick Modify button to modify the data source value itself.

You may later decide to change the user prompts that appear in the Dynamo Properties dialog box. You can do this by selecting the Dynamo object (in a picture or Dynamo Set), and clicking the Build Dynamo button from the Dynamo toolbar (Classic view) or by selecting Build Dynamo from the Dynamo list, in the Dynamo group, on the Tools tab (Ribbon view). When the Dynamo has animated properties, the Build Dynamo with User Prompts dialog box appears. The User Prompts appear in brackets, {}. To change the User Prompt, delete or modify the contents of the User Prompt field and click OK.

## Converting Dynamos to Objects

If you want to convert a Dynamo object back to its individual objects, right-click the Dynamo object and select Convert to Objects. Dynamo objects, just like the pre-existing Dynamo objects, ceases to exist if the Dynamo is ungrouped and converted to individual objects.

When a Dynamo object in a picture is converted to individual objects, the link to the Master Dynamo no longer exists. You cannot use the Quick Dynamo Updater, the Dynamo Updater Wizard, and the Cross Reference Tool to update this instance of the Dynamos object. Only Dynamo objects can be updated with these tools.

## Dynamo Dialog Boxes

The Dynamo feature includes the following dialog boxes:

- [Add Objects to Dynamo Set Dialog Box](#)
- [Build Dynamo Wizard Dialog Box](#)
- [Build Dynamo with User Prompts Dialog Box](#)
- [Data Sources Adjustment Option Dialog Box](#)
- [Dynamo Properties Dialog Box](#)
- [Dynamo Sets Converter Dialog Box](#)
- [Dynamo Sets Converter Progress Dialog Box](#)
- [Dynamo Sets Converter - Conversion Adjustment Option Dialog Box](#)
- [Dynamo Converter Wizard](#)
- [Dynamo Converter Wizard Progress Dialog Box](#)
- [Dynamo Updater Wizard](#)
- [Dynamo Updater Dialog Box](#)
- [Dynamo Updater - Update Behavior Dialog Box](#)
- [Overwrite Master Dynamo Dialog Box](#)
- [Quick Dynamo Updater Dialog Box](#)
- [Quick Dynamo Converter Dialog Box](#)

### Add Objects to Dynamo Set Dialog Box

The Add Objects to Dynamo Set dialog box displays the following items:

#### Name

A read-only field that displays the object name of the selected Dynamo for informational purposes. You cannot edit this field.

## Description

A read-only field that displays the object description of the selected Dynamo for informational purposes. You cannot edit this field.

## Create a New Master Dynamo

Select this option to create a new master Dynamo from the selected object.

## Add to Dynamo Set As-Is

Select this option to add the selected object to the Dynamo Set without creating a Master Dynamo object.

## Build Dynamo Wizard Dialog Box

The Build Dynamo Wizard dialog box displays the following items:

### Dynamo Name Item

Specify a name for the Dynamo in this field. The name you specify must satisfy the following conditions:

- It must begin with an alphabetic character, and must contain only alphanumeric characters.
- It cannot be blank, and cannot contain any spaces.
- The maximum number of characters is 64.
- The name cannot be changed while a script is running or paused.
- The name cannot contain reserved VBA names. See the Microsoft VBA help system for more information on VBA reserved words.

### Dynamo Description

Optionally, specify a description of the Dynamo Instance in this field. The Dynamo Description can be different for each Dynamo Instance. For the Master Dynamo, the description is empty and read-only.

### Object Description

Optionally, specify a description of the object in this field.

## Build Dynamo with User Prompts Dialog Box

The Build Dynamo Wizard With User Prompts dialog box displays the following items:

### Dynamo Name Item

Specify a name for the Dynamo in this field. The name you specify must satisfy the following conditions:

- It must begin with an alphabetic character, and must contain only alphanumeric characters.
- It cannot be blank, and cannot contain any spaces.

- The maximum number of characters is 64.
- The name cannot be changed while a script is running or paused.
- The name cannot contain reserved VBA names. See the Microsoft VBA help system for more information on VBA reserved words.

### Dynamo Description

Optionally, specify a description for the Dynamo Instance in this field. The Dynamo Description can be different for each Dynamo Instance. For the Master Dynamo, the description is empty and read-only.

### Object Description

Optionally, specify a description of the object in this field.

### Object Property

Displays each property assigned to the Dynamo.

### Current Setting

Displays the value, such as the tagname or command script variable, that is currently assigned to the object property.

### User Prompt

The User Prompt fields allow you to enter Dynamo prompts for each object property so you can re-use the Dynamo in multiple displays. A Dynamo prompt should be meaningful, so that when it is placed in a picture, the user can enter the unique properties for the Dynamo.

## Data Sources Adjustment Option Dialog Box

The Data Sources Adjustment Option dialog box displays the following items:

### Update Behavior

The Update Behavior area lets you specify how the Dynamo Updater should reconcile a data source mismatch between a Master Dynamo and Dynamo Instance. Select one of the following options:

- **Update Dynamo, and use Master Dynamo data sources** - If you want to update mismatched Dynamo Instances, but do not want to apply any new data sources from the Master Dynamo. This option uses all data sources from the Master Dynamo, and no data sources from the Dynamo Instance.
- **Update Dynamo, and try to match up data sources** - If you want to update mismatched Dynamo Instances using new data sources from the Master Dynamo.

For example, if a Master Dynamo object contains only one data source (user prompt) based on an animation, but a previous version (an instance of that Dynamo) includes three data sources based on animations, a best guess match is made. For the best guess, iFIX decides which one of the three data sources to use in the instance, and a report is generated based on your settings.

If the object type differs between the Master Dynamo and the Instance, there is no attempt to update the data sources in the animation for that object.

- **Do not Update Dynamo** - If you only want to view a report of mismatched Dynamos and make no actual updates.
- **Prompt for Choice** - If you want a prompt to display with your options each time a mismatched Dynamo is found. This option is the default.

## Dynamo Properties Dialog Box

The Dynamo Properties dialog box appears when a Dynamo is double-clicked or when the Dynamo is first copied into a new picture, and there are user prompts available for the Dynamo. This allows you to quickly modify the data source associated with the property, if necessary. The Dynamo Properties dialog box displays the following items:

### Dynamo Name

A read-only field that displays the Dynamo name for informational purposes. You cannot edit this field.

### Dynamo Description

Optionally, specify a description of the Dynamo Instance in this field. The Dynamo Description can be different for each Dynamo Instance. For the Master Dynamo, the description is empty and read-only.

### Dynamo Property List

The Dynamo Property list box displays each property assigned to the Dynamo. For each Dynamo Property:

- The **Current Setting** field displays a value, such as the tagname or command script variable, that is currently assigned to the object property.
- The **User Prompt** field allows you to enter Dynamo prompts for each object property, so you can re-use the Dynamo in multiple displays. A Dynamo prompt should be meaningful, so that when it is placed in a picture, the user can enter the unique properties for the Dynamo.

## Dynamo Sets Converter Dialog Box

The Dynamo Sets Converter dialog box displays the following items:

### Current Dynamo Set Path

Click the button next to this field to select a path containing the Dynamo Sets you want to convert.

### Dynamo Sets List Box

Displays the Dynamo Sets that exist in the Current Dynamo Set Path. You can expand Dynamo Sets to display the individual legacy Dynamos (top-level group objects) contained in each Dynamo Set. The Dynamo Sets list box is where you select the legacy Dynamos or Dynamo Sets you want to convert.

### Select All/Clear All

Click either the Select All button or the Clear All button to quickly select or de-select all the Dynamos in every listed Dynamo Set.

## Convert

After you have selected at least one legacy Dynamo, the Convert button becomes available. When you click the Convert button, the Dynamo Sets Converter examines the selected Dynamos and opens the Dynamo Sets Converter dialog box, where you can convert Dynamos.

**NOTE:** If the selected Dynamo Set is open before the conversion process begins, it will not be saved; close all Dynamo Sets before conversion to ensure that changes are saved.

## Dynamo Sets Converter (Progress) Dialog Box

After selecting Convert on the Dynamo Sets Converter dialog box, the Dynamo Sets Converter Progress dialog box appears. It displays the following items:

### Quick Dynamo Sets Report for Conversion

Item	Description
Selected Group Objects to Convert - List Box	Displays the Dynamo Instances that were selected for conversion. This list is generated from the Dynamo Sets Converter dialog box.
Selected Group Objects to Convert - Table	Displays the name, object description, dynamo description, revision, file name, and full name of the Dynamo Set selected in the conversion list.

### Convert Group Objects

Item	Description
Conversion Progress Status	Graphically displays the progress of the Dynamo Conversion process.
Conversion Progress Status - Log Display	Displays the date, time, and status of each Dynamo conversion attempted as part of the automated Dynamo Convert process.

### Run Conversion

Launches the conversion process, which converts existing Dynamos to Dynamo objects.

**NOTE:** While the conversion process is running, the Run Conversion button changes to a Cancel Conversion button, allowing you the option of canceling the conversion while it is in progress.

## Dynamo Converter - Conversion Adjustment Option Dialog Box

The Dynamo Converter - Conversion Adjustment Option dialog box displays the following items:

### Options for the Conversion

The Options for the Conversion area lets you specify how the Dynamo Converter should reconcile a mismatch between a Master Dynamo and Dynamo. Select one of the following options:

- **Convert to Dynamo but do not update Dynamo** - If you want to convert the Dynamo to a Dynamo object, but do not want to link it to the Master Dynamo. Use this option if you want to use this Dynamo to create a new Master Dynamo.
- **Convert to Dynamo, then update Dynamo** - If you want to convert the Dynamo to a Dynamo object, and want to link it to the Master Dynamo.
- **Do not convert to Dynamo** - If you only want to view a report of mismatched Dynamos and make no actual conversions for mismatches. Mismatched Dynamos are not converted.

### Apply

Applies the selected adjustment option to a single Dynamo object in the conversion.

### Apply to All

Applies the selected adjustment option to all Dynamo objects in the conversion.

## Dynamo Converter Wizard Dialog Box

The Dynamo Converter Wizard dialog box displays the following items:

### Convert Behavior Tab

The Convert Behavior tab lets you set how Dynamos are handled when the object structure of a Master Dynamo and a Dynamo do not match. You can select from the following options:

- **Convert Dynamo, but do not update Dynamo (Don't link to Master Dynamo)** - If you want to convert the Dynamo to a Dynamo object, but do not want to link it to the Master Dynamo. Use this option if you want to use this Dynamo to create a new Master Dynamo.
- **Convert Dynamo, then update Dynamo (Link to Master Dynamo). Try to match up data sources** - If you want to convert the Dynamo to a Dynamo object, and want to link it to the Master Dynamo.
- **Do not convert Dynamo** - If you only want to view a report of mismatched Dynamos and make no actual conversions. Dynamos that are not mismatched are converted.
- **Prompt for choice** - If you want to be prompted each time a mismatch is detected.

### Convert Options Tab

Item	Description
Save Status Trail Check Box	Select this check box to save a text log of the Dynamo Converter's activities. If you do not check this box, the remaining options on the Convert Options Tab are unavailable.
Save Status Trail Edit Box	Specify a folder, path, and file name for the Dynamo Converter's log file, or click the Browse button to select a file location.
Save Status Trail Browse Button	Click this button to select a path and filename for the Dynamo Converter's log file.
Append/Overwrite Options	Choose Append or Overwrite to either append the new results to the existing status trail log, or overwrite the log file with the new results. If no log exists, either option will create a new status trail log file.

## Select Dynamos Tab

Item	Description
Current Dynamo Set Path	Click the button next to this field to select a path containing the Dynamo Sets you want to convert.
Select DynamoSets and Master Dynamo	Use this drop-down list to select a Dynamo set.
Master Dynamo List Box	Displays the Master Dynamos that exist in the selected Dynamo Sets. The Master Dynamo list box is where you select the Master Dynamos within selected Dynamo Sets you want to convert with the Dynamo Converter Wizard. Only one Master Dynamo can be selected for conversion.
Select All/Clear All	Not available.
Current Picture Path	Click the button next to this field to select a path containing the pictures you want to convert.
Pictures List Box	Displays the pictures that exist in the Current Picture Path. The Pictures list box is where you select the pictures and group objects you want to convert with the Dynamo Converter Wizard.
Pictures Select All/Clear All	Click either the Select All button or the Clear All button to quickly select or de-select all the pictures and group objects in the Pictures List Box.

## View Settings Tab

The View Settings tab displays the options that have been selected from the Convert Behavior, Convert Options, and Select Dynamos tabs.

### Back/Next Buttons

Click the Back or Next buttons to navigate back and forth between tabs. Alternatively, you can click on a tab directly.

### Run Convert Button

After you have selected one Master Dynamo and at least one group object in the picture in the Select Dynamos Tab, the Run Convert button becomes available. Click the Run Convert button to begin the conversion process.

## Dynamo Converter Dialog Box

The Dynamo Converter Progress dialog box displays the following items:

### Quick Dynamo Report for Conversion

Item	Description
Selected Group Objects to convert - List Box	Displays the group objects that were found to not be Dynamos. This list is generated from the Quick Dynamo Converter dialog box or the Dynamo Converter Wizard dialog box.
Selected Group Objects to convert -	Displays the name, object description, dynamo description, revision, file name, and full name of the Dynamo and Master Dynamo asso-

Table	ciated with the selected Dynamo.
-------	----------------------------------

## Convert Group Objects

Item	Description
Convert Behavior	Displays the currently selected behavior that the Dynamo Converter should use when the number of data sources differs between a Master Dynamo and Dynamo.
Modify	Click the Modify button to change the conversion behavior.
Maintain Size	Select to retain the current size of the Dynamo Instance.
Maintain Captions	Select to retain existing captions for all Dynamos.
Conversion Progress Status	Graphically displays the progress of the Dynamo conversion process.
Conversion Progress Status - Log Display	Displays the date, time, and status of each Dynamo and Master Dynamo conversion attempted as part of the automated Dynamo conversion process.

## Run Conversion

Launches the conversion process, which converts legacy Dynamos into Dynamo objects. Conversions are made based on the Convert Behavior setting.

**NOTE:** While the conversion process is running, the Run Conversion button changes to a Cancel Conversion button, allowing you the option of canceling the conversion while it is in progress.

## Dynamo Updater Wizard

The Dynamo Updater Wizard dialog box displays the following items:

### Update Behavior Tab

The Update Behavior tab lets you set how Dynamos are handled when the number of data sources in a Master Dynamo and a Dynamo Instance Object do not match. You can select from the following options:

Item	Description
Update Dynamo, and use Master Dynamo data sources	If you want to update mismatched Dynamo Instances, but do not want to apply any of the data sources from the Dynamo Instance. This option uses all data sources from the Master Dynamo, and no data sources from the Dynamo Instance.
Update Dynamo, and try to match up data sources	If you want to update mismatched Dynamo Instances using data sources from the Dynamo Instance and a best guess matching algorithm.  For example, if a Master Dynamo object contains only one data source (user prompt) based on an animation, but a previous version (an instance of that Dynamo) includes three data sources based on animations, a best guess match is made. For the best guess, iFIX decides which one of the three data sources to use in the instance, and a report is generated based on your settings.

	If the object type differs between the Master Dynamo and the Instance, there is no attempt to update the data sources in the animation for that object.
Do not update Dynamo	If you only want to view a report of mismatched Dynamos and make no actual updates.
Prompt for choice	If you want a prompt to display with your options each time a mismatched Dynamo is found. This option is the default.

### Update Options Tab

Item	Description
Save Status Trail Check Box	Select this check box to save a text log of the Dynamo Updater's activities. If you do not check this box, the rest of the options on the Update Options Tab is unavailable.
Save Status Trail Edit Box	Specify a folder, path, and file name for the Dynamo Updater's log file, or click the Save Status Trail Browse button to select a file location.
Save Status Trail Browse Button	Click this button to select a path and filename for the Dynamo Updater's log file.
Append/Overwrite Options	Choose Append or Overwrite to either append the new results to the existing status trail log, or overwrite the log file with the new results. If no log exists, either option will create a new status trail log file.

### Select Dynamos Tab

Item	Description
Current Dynamo Set Path	Click the button next to this field to select a path containing the Dynamo Sets you want to update.
Dynamo Sets List Box	The Dynamo Sets List Box displays the Dynamo Sets that exist in the Current Dynamo Set Path. You can expand Dynamo Sets to display the individual Dynamos contained in each Dynamo Set. The Dynamo Sets List Box is where you select the Dynamos or Dynamo Sets you want to update with the Dynamo Updater Wizard.  <b>NOTE:</b> The Dynamo Updater Wizard does not support dynamos with Enhanced Charts.
Dynamo Sets Select All/Clear All	Click either the Select All button or the Clear All button to quickly select or de-select all the Dynamos in every listed Dynamo Set.
Current Picture Path	Click the button next to this field to select a path containing the pictures you want to update.
Pictures List Box	The Pictures List Box displays the pictures that exist in the Current Picture Path. The Pictures List Box is where you select the pictures you want to update with the Dynamo Updater Wizard.
Pictures Select All/Clear All	Click either the Select All button or the Clear All button to quickly select or de-select all the pictures in the Pictures List Box.

## **View Settings Tab**

The View Settings tab displays the options that have been selected from the Update Behavior, Update Options, and Select Dynamos tabs.

### **Back/Next Buttons**

Click the Back or Next buttons to navigate back and forth between tabs. Alternatively, you can click on a tab directly.

### **Launch Updater Button**

After you have selected at least one Dynamo and one picture in the Select Dynamos Tab, the Launch Updater button becomes available. When you click the Launch Updater button, the Dynamo Updater Wizard examines the selected Dynamos and pictures and opens the Dynamo Updater dialog box, where you can update mismatched Dynamo Instances and Master Dynamo revisions according to the options you have set.

## **Dynamo Updater Dialog Box**

The Dynamo Updater dialog box displays the following items:

### **Quick Dynamo Report**

Item	Description
Dynamo Instances Mismatched With Revision Of Master Dynamo - List Box	Displays the Dynamo Instances that were found to be a different revision from their associated Master Dynamo. This list is generated from the Quick Dynamo Updater dialog box or the Dynamo Updater Wizard dialog box.
Dynamo Instances Mismatched With Revision Of Master Dynamo - Table	Displays the name, object description, dynamo description, revision, file name, and full name of the Dynamo Instance and Master Dynamo associated with the Dynamo selected in the mismatch list.

### **Update Dynamo Instances**

Item	Description
Update Behavior	Displays the currently selected behavior that the Dynamo Updater should use when the number of data sources does not match between a Master Dynamo and Dynamo Instance.
Modify	Click the Modify button to change the Update Behavior.
Maintain Size	Select to retain the current size of the Dynamo Instance.
Maintain Captions	Select to retain existing captions for all Dynamo Instances.
Update Progress Status	The Update Progress Status bar graphically displays the progress of the Dynamo Update process.
Update Progress Status - Log Display	Displays the date, time, and status of each Dynamo Instance and Master Dynamo modification attempted as part of the automated Dynamo Update process.

## Run Update

Launches the update process, which reconciles the revision differences between associated Dynamo Instances and Master Dynamos. Updates are made based on the Update Behavior setting.

### NOTES:

- While the update process is running, the Run Update button changes to a Cancel Update button, allowing you the option of canceling the update while it is in progress.
- The Dynamo Updater does not support dynamos with Enhanced Charts.

## Dynamo Updater - Update Behavior Dialog Box

The Dynamo Updater - Update Behavior dialog box displays the following items:

### Data Source Adjustments

The Data Source Adjustments area lets you specify how the Dynamo Updater should reconcile a data source mismatch between a Master Dynamo and Dynamo Instance. Select one of the following options:

- **Update the Dynamo, and use Master Dynamo data sources** - If you want to update mismatched Dynamo Instances, but do not want to apply any of the data sources from the Dynamo Instance. This option uses all data sources from the Master Dynamo, and no data sources from the Dynamo Instance.
- **Update the Dynamo and try to match up the Data Sources** - If you want to update mismatched Dynamo Instances using data sources from the Dynamo Instance and a best guess matching algorithm.

For example, if a Master Dynamo object contains only one data source (user prompt) based on an animation, but a previous version (an instance of that Dynamo) includes three data sources based on animations, a best guess match is made. For the best guess, iFIX decides which one of the three data sources to use in the instance, and a report is generated based on your settings.

If the object type differs between the Master Dynamo and the Instance, there is no attempt to update the data sources in the animation for that object.

- **Do not update Dynamo** - If you only want to view a report of mismatched Dynamos and make no actual updates.

### Apply

Applies the selected adjustment option to a single Dynamo object in the update.

### Apply to All

Applies the selected adjustment option to all Dynamo objects in this update.

## Overwrite Master Dynamo Dialog Box

The Overwrite Master Dynamo dialog box displays the following items:

### **Name**

A read-only field that displays the Dynamo name for informational purposes. You cannot edit this field.

### **Dynamo ID**

A read-only field that displays the Dynamo ID for informational purposes. You cannot edit this field.

### **Description**

A read-only field that displays the Dynamo Instance description for informational purposes. You cannot edit this field.

### **Overwrite the Existing Master Dynamo**

Select this option to overwrite the existing Master Dynamo with the updated one. The Dynamo ID does not change when you overwrite the Master Dynamo and your links to existing Dynamos remain.

### **Create a New Master Dynamo**

Optionally, specify a description of the object in this field. A new Dynamo ID is generated, and your links to existing Dynamos Instances no longer exist.

## **Quick Dynamo Updater Dialog Box**

The Quick Dynamo Updater dialog box displays the following items:

### **Dynamics on Active Picture**

Allows you to search Dynamo objects only in the active picture.

### **Dynamics on All Open Pictures**

Allows you to search Dynamo objects in all open pictures.

## **Quick Dynamo Converter Dialog Box**

The Quick Dynamo Converter dialog box displays the following items:

### **Select Dynamo Sets**

Allows you to select the Dynamo Set to convert.

### **Select Master Dynamo**

Allows you to select the Master Dynamo.

### **Select Group Object(s)**

Allows you to select which group objects to convert to Dynamo objects. Your choice is selected on the active picture.

### **Get Selected Group Object(s) on active picture**

Propagates the object selected on the picture to the Select Group Object(s) list.

**NOTE:** The object(s) must be selected on picture prior to clicking this button.

### **Clear All Selection**

Clears all items selected in the Select Group Object(s) list.

### **Run Convert**

Launches the conversion process, which converts old Dynamos (group objects) into Dynamo objects. Conversions are made based on the Convert Behavior settings.

## **How Do I...**

The following sections provide information on how to work with Dynamo objects:

- [Opening the Dynamo Toolbar](#)
- [Working with Dynamo objects](#)
- [Working with Dynamo properties](#)
- [Working with Master Dynamos and Instances](#)
- [Working with Dynamo Sets](#)

### **Opening the Dynamo Toolbar**

#### ► To open the Dynamo toolbar:

1. In the iFIX WorkSpace system tree, double-click the Project Toolbar Files item to open the folder.
2. Double-click the Toolbars folder to view a list of toolbars.
3. Double-click the DynamoToolbar icon to open the Dynamo Toolbar. The six-button Dynamo Toolbar now appears in the WorkSpace.

### **Working with Dynamo Objects**

The following sections describe tasks that you can perform when working with Dynamo objects:

- [Creating a Dynamo Object](#)
- [Creating a Dynamo with User Prompts](#)
- [Displaying One Dynamo User Prompt for Multiple Dynamo Object Properties](#)
- [Displaying No User Prompts for a Dynamo Object with Animations](#)
- [Defining Partial Substitution for a Dynamo's Property Values](#)

- [Modifying Dynamo User Prompts](#)
- [Applying User Prompts for Command Scripts](#)
- [Generating a Report of Dynamo Usage in the Cross Reference Tool](#)

## Creating a Dynamo Object in a Picture

► To create a Dynamo object in a picture:

1. In the iFIX WorkSpace, select the custom object or group of objects that you want to convert to a Dynamo.
2. In Classic view, on the Dynamo toolbar, click the Build Dynamo  button.  
-Or-  
In Ribbon view, on the Tools tab, in the Dynamos group, click Dynamos, and then click Build Dynamo.  
-Or-  
Right-click the selected objects and choose Dynamo.
  - If the custom object properties are not animated or set to specific values, the Build Dynamo Wizard dialog box appears, allowing you to name the Dynamo, and provide descriptions for the Dynamo and object.
  - If the object properties are animated, the Build Dynamo with User Prompts dialog box appears. For more information, refer to the [Creating a Dynamo with User Prompts](#) section.
3. In the Dynamo Name field, enter the name you want use for this Dynamo.
4. Optionally, in the Dynamo Description field, enter a description for this Dynamo.
5. Optionally, in the Object Description field, enter a description for this object.
6. Click OK.

**TIP:** When you first create a Dynamo in the WorkSpace, it is not a Master Dynamo. If you immediately want to create a Master Dynamo object(s), instead of using the Build Dynamo Wizard, drag-and-drop the object(s) to a Dynamo set. The Add Object to Dynamo Sets dialog box appears for each object. Select the Create a New Master Dynamo option in each dialog box, and click OK. These actions create the Dynamo object(s) and add them to the set as a Master Dynamo(s). Or, you can create the Dynamo object, and then drag-and-drop it into the Dynamo Set to create a new Master Dynamo.

## Creating a Dynamo Object with User Prompts within a Picture

► To create a Dynamo object with user prompts within a picture:

1. In the iFIX WorkSpace, within a picture, select the custom object or group that you want to convert to a Dynamo.
2. In Classic view, on the Dynamo toolbar, click the Build Dynamo  button.  
-Or-

In Ribbon view, on the Tools tab, in the Dynamos group, click Dynamos, and then click Build Dynamo.

-Or-

Right-click the selected objects and choose Dynamo.

**NOTE:** You must have an object with at least one animation for the Build Dynamo with User Prompts dialog box to appear. Otherwise, the generic Build Dynamo Wizard dialog box appears, requesting only a name.

3. In the Dynamo Name field, enter the name you want use for this Dynamo.
4. Optionally, in the Dynamo Description field, enter a description for this Dynamo.
5. Optionally, in the Object Description field, enter a description for this object.
6. In the User Prompt field, for each object property, enter a prompt to display in the Dynamo User Interface that the Build Dynamo Wizard creates.

The prompt can be up to 127 characters long. Surround the prompt with brackets if you are using [partial substitution](#). Use asterisks (\*) for static values. If you do not enter a User Prompt, the Build Dynamo Wizard uses the property name of the animation for that object property, and no prompt appears. If you want to ensure that the same prompt is used across multiple properties, make sure that all prompts match. For more information, refer to the [Displaying One Dynamo User Prompt for Multiple Object Properties](#) section.

7. Click OK.
8. To test your Dynamo User Interface, double-click the Dynamo. The Dynamo Properties dialog box with User Prompts appears.

**TIP:** When you first create a Dynamo in the WorkSpace, it is not a Master Dynamo. If you immediately want to create a Master Dynamo object(s), instead of using the Build Dynamo Wizard, drag-and-drop the object(s) to a Dynamo set. The Add Object to Dynamo Sets dialog box appears for each object. Select the Create a New Master Dynamo option in each dialog box, and click OK. These actions create the Dynamo object(s) and add them to the set as a Master Dynamo(s). Or, you can create the Dynamo object, and then drag-and-drop it into the Dynamo Set to create a new Master Dynamo.

## Displaying One Dynamo User Prompt for Multiple Dynamo Object Properties

### ► To display one Dynamo user prompt for multiple Dynamo object properties:

In the Build Dynamo with User Prompts dialog box, for each Dynamo property, enter the same value in the User Prompt field.

For example, enter *Tagname* for the User Prompt if you want the Tagname to be the same for all three properties, as shown in the following table.

Object Property	Current Setting	User Prompt
Oval1.VerticalPosition	FIX32.MYNODE.MYTAG.F_CV	Tagname
Rect1.VerticalFillPercentage	FIX32.MYNODE.OTHERTAG.F_CV	Tagname
Oval2.HorizontalPosition	FIX32.MYNODE.MYTAG.F_CV	Tagname

## Displaying No User Prompts for a Dynamo Object with Animations

► To display no user prompts for a Dynamo object with animations:

In the Build Dynamo with User Prompts dialog box, for each Dynamo property, do not enter a value in the User Prompt field.

## Defining Partial Substitution for a Dynamo's Property Values

► To define partial substitution for a Dynamo's property values:

1. In the iFIX WorkSpace, select the custom object or group that you want to convert to a Dynamo.
  2. In Classic view, on the Dynamo toolbar, click the Build Dynamo  button.  
-Or-
  - In Ribbon view, on the Tools tab, in the Dynamos group, click Dynamos, and then click Build Dynamo.
- NOTE:** You must have an object that supports animations for the Build Dynamo with User Prompts dialog box to appear. Otherwise, the generic Build Dynamo Wizard dialog box appears, requesting only a name.
3. Optionally, in the Dynamo Description field, enter a description for this Dynamo.
  4. Optionally, in the Object Description field, enter a description for this object.
  5. In the User Prompt field(s), enter the User Prompt surrounded by brackets {} and use asterisks (\*) for static values.
  6. Click OK.

## Applying User Prompts for Command Scripts

To do this, for each command script, add a Variable object to the Dynamo group and change the command script parameter as described in the example below.

► To apply user prompts for command scripts:

**NOTE:** The following steps assume you have the command script: ToggleDigitalPoint "FIX32.NODE.TAG.F\_CV" on the click event of an oval.

1. Create a local variable object (for example, call it MyVar). Set the Variable Type to String. Do not assign it a data source.
2. Right-click the object, and click Property Window on the shortcut menu. Set the InitialValue property to a value such as FIX32.NODE.TAG.F\_CV.
3. In the WorkSpace system tree, select the variable object and drag it to the Dynamo Set group.
4. Right-click the oval, and click Edit Script on the shortcut menu.
5. Modify the oval's click event script from ToggleDigitalPoint "FIX32.NODE.TAG.F\_CV" to ToggleDigitalPoint MyVar.InitialValue.
6. On the Dynamo toolbar, click the Build Dynamo button. The Build Dynamo with User Prompts dialog box appears.

7. Enter a User Prompt for MyVar.InitialValue. This allows the user to change the parameter for the ToggleDigitalPoint command by changing the value of the variable.
8. Click OK.

## **Generating a Report of Dynamo Usage in the Cross Reference Tool**

► **To generate a report of Dynamo objects:**

1. In Classic view, from the WorkSpace toolbar, click the Cross Reference Tool button.

-Or-

In Ribbon view, on the Applications tab, in the Utilities group, click Utilities, and then click Cross Reference Tool.

2. Generate a report with the Quick Report or Report Wizard.

To generate a report with the Quick Report:

- a. From the File menu, select Quick Report. T
- b. From the Object Tree, select a picture or a Dynamo Set. This allows you to search a single picture for Dynamos, or all pictures containing Dynamos within a specified set.
- c. Select the Dynamos Option. Click Search.

- Or -

To generate a report with the Report Wizard:

- a. From the Tool menu, select Report Wizard.
- b. Select the Dynamos in Pictures or Pictures Containing Dynamos option.
- c. On the Pictures tab, select the Pictures that you want to search.
- d. On the Dynamo Sets tab, select the Dynamo Sets that you want search for.
- e. Click OK.

If you did not earlier select the prompt to refrain from a reminder message, a message box appears indicating that you cannot access the iFIX WorkSpace when the Cross Reference Tool is running.

3. Click OK to continue. Wait a few moments for the report to generate in the Cross Reference Tool.

**NOTE:** You cannot access the iFIX WorkSpace while the Cross Reference Tool generates a report. After the report completes, you are able to access the iFIX WorkSpace again.

4. When the update is complete, review the report.

**TIP:** You can export the report to a .csv, .htm, .xls, or .tb2 file. On the File menu, click Save to open the Save As dialog box.

## **Working with Dynamo Properties**

The following sections describe tasks that you can perform when working with Dynamo properties:

- [Changing a Dynamo Object's Properties](#)
- [Changing a Dynamo Object's User Prompt Properties](#)
- [Changing a Dynamo's Properties from Another Object](#)
- [Converting a Dynamo to Objects](#)

## Changing a Dynamo Object's Properties

► To change a Dynamo object's properties:

1. In the iFIX WorkSpace, in a picture or Dynamo Set, right-click the Dynamo object (Instance or Master) and select Property Window. The Property window appears in the WorkSpace.  
**NOTE:** If you double-click a Dynamo, a dialog box does not display. Instead, the VBA Editor appears. You must right-click the Dynamo object to view the properties.
2. For each Dynamo object, provide property updates as needed. The Dynamo-specific properties include:
  - **Dynamo ID** - You cannot edit this field; it is a system assigned, unique value. This value is a Globally Unique Identifier (GUID). If you have not dragged the Dynamo Instance to a Dynamo Set to create a Master Dynamo, this number is a series of zeros.
  - **Dynamo Description** - Enter a new description. The Dynamo Description can be different for each Dynamo Instance. The maximum number of characters you can enter in this field is displayed in the Max\_Dynamo\_Desc\_Length field.
  - **Master** - You cannot edit this field; it is a system assigned value.
  - **Max\_Dynamo\_Desc\_Length** - You cannot edit this field; it is a system assigned value of 256 characters. This limit is used by the Dynamo Description field.
  - **Revision** - You cannot edit this field; it is a system assigned number for the revision.

Other properties can be updated as well, but be aware you should use caution when updating Master Dynamos this way. Refer to the [Updating a Master Dynamo](#) section for steps on how to properly update other properties for a Master Dynamo and the objects within it.

**NOTE:** Alternatively, you can select the Master Dynamo or Dynamo Instance object, and on the Dynamo toolbar, click the Build Dynamo  button to open the Build Dynamo or Build Dynamo with User Prompts dialog box. This dialog box provides a way to access only the Dynamo properties.

## Changing a Dynamo Object's User Prompt Properties

► To change a Dynamo object's user prompt properties:

1. In the iFIX WorkSpace, within a picture, double-click the Dynamo object (the Dynamo Instance). The Dynamo Properties dialog box appears.
2. For each Dynamo property, enter an appropriate data source.

If necessary, use the scroll bar to page through the list. If you are entering a tagname, you can launch the Expression Builder by clicking the Browse (...) button to select from a list of tags.

3. Select OK to accept the data sources.

**TIPS:**

- You can add a new tag by entering it in the Current Setting field and pressing Tab to move the cursor off the field. A dialog box appears allowing you to create the tag.
- You can modify a tag by entering the tagname in the Current Setting field and clicking the Quick Modify button to the right of the field.

## Changing a Dynamo's Properties from Another Object

The following example demonstrates how to configure a Dynamo's properties from another object's edit event in configuration mode or click event in run mode.

Using a Dynamo named Dynamo2 that has a User Prompt named "Rect Fill," the following example displays the original value of the property in a message box and on the click of the message box OK button. It also changes the value and displays the new value in a message box.

► **To change a Dynamo's properties from another object:**

1. On the Click event of a Command button, enter the following code:

```
Private Sub CommandButton1_Click()
Dim x As String

'Creates an instance of the Dynamo Properties form
GetFormEditDynamo

'Initialize the data type array with the Dynamo2 Dynamo information, and the User Prompt 'whose Value you are looking for
NewEditDynamoForm.Initialize Dynamo2, "Rect Fill"

' Get the Dynamo prompts value
x = NewEditDynamoForm.DynamoPromptValue

'display a message box with that value
MsgBox x

'Set the new Prompt Value then re-initialize the Dynamo.
'If you do not re-initialize the Dynamo
'the old Value will be retrieved.
NewEditDynamoForm.DynamoPromptValue = "FIX32.MYNODE.RAMP.F_CV"
'Re-initialize the array
NewEditDynamoForm.Initialize Dynamo2, "Rect Fill"

'Get the Dynamo Prompt Value again
x = NewEditDynamoForm.DynamoPromptValue

MsgBox x 'display a message box with the new value
```

2. Switch to run mode and click on the command button. The first message box displays the current data source for the Dynamo "Rect Fill" property.
3. Click OK. The second message box displays the new data source for the Dynamo "Rect Fill".

## Converting a Dynamo to Objects

► To convert a Dynamo to objects:

1. In the picture, select the Dynamo object.
2. Right-click the Dynamo object, and select Convert to Objects. The Dynamo attribute is removed and the objects return to their original state. You can now make changes to individual object properties.
3. Remove EasyDynamo variables.

In the WorkSpace System Tree, if an object has a + icon next to it, click the icon. The animation object displays. If the animation object has a + icon next to it, click the icon. If the animation object contains an EasyDynamo variable, delete the EasyDynamo variable.

## Working with Master Dynamos and Instances

The following sections describe tasks that you can perform when working with Master Dynamos and Dynamo Instances:

- [Creating a Master Dynamo](#)
- [Adding a Dynamo Instance to a Picture](#)
- [Modifying the User Prompts of a Dynamo Instance](#)
- [Modifying the User Prompts of a Master Dynamo](#)
- [Converting Dynamos Using the Quick Dynamo Converter](#)
- [Converting Dynamos Using the Dynamo Converter Wizard](#)
- [Converting Dynamo Sets Using the Dynamo Sets Converter](#)
- [Updating a Master Dynamo](#)
- [Updating Dynamo Instances Using the Quick Dynamo Updater](#)
- [Updating Dynamo Instances Using the Dynamo Updater Wizard](#)
- [Updating Dynamo Instances Using the Cross Reference Tool](#)
- [Changing Dynamo Instance Update Options](#)

## Creating a Master Dynamo

► To create a Master Dynamo:

1. Create a Dynamo object. Use the steps in either section:
  - [Creating a Dynamo \(without Animations that include User Prompts\)](#)
  - [Creating a Dynamo with User Prompts](#)
2. Open a Dynamo Set. For details, refer to the [Opening Dynamo Sets](#) section.
3. Drag-and-drop or copy and paste the Dynamo object(s) you created into the Dynamo Set. The Dynamo object automatically becomes a Master Dynamo.

**NOTES:**

- Alternatively, if you did not create a Dynamo object yet, you can still drag-and-drop the object(s) to the set. The Add Object to Dynamo Sets dialog box appears for each object you add. Select the Create a New Master Dynamo option and click OK in each dialog box that appears. These actions create the Dynamo object(s) and add them to the set as a Master Dynamo(s). If you want to change the Dynamo description, object description, or name, you must edit the Dynamo properties separately.
- When a group containing Dynamo objects is promoted to a Master Dynamo, as in the case when it is dragged and dropped into a Dynamo Set, the contained Dynamo objects (instances) are converted to standard group objects. A message prompts you about this occurrence, and allows you to cancel the operation.

4. Save the Dynamo Set.
5. Delete the original Dynamo object from step1, since this Dynamo object is not an instance of the Master Dynamo.

The Dynamo object in step 1 is not connected to the Master Dynamo created in step 4. If you look at the Dynamo\_ID in the Property window, you will notice that the number for the original Dynamo is all zeros and does not match the Master Dynamo. This means that it contains no links to the master. Only Dynamo Instances that you add *after* you create the Master Dynamo are connected to the Master Dynamo.

**TIP:** If you want the original picture to include an instance of the Master Dynamo, drag-and-drop or copy and paste the Master Dynamo object from the Dynamo set back to the picture that you created the original Dynamo object in.

## Adding a Dynamo Instance to a Picture

### ► To add a Dynamo Instance to a picture:

1. Open a Dynamo Set. For details, refer to the [Opening Dynamo Sets](#) section.
2. From the Dynamo Set, drag-and-drop or copy and paste the Master Dynamo object into the picture.

Each new Dynamo object that you add to a picture (not a Dynamo Set) becomes a new Dynamo Instance.

**NOTE:** Pre-built Dynamos and Dynamos created in versions of iFIX before 4.5 are not considered Dynamo objects. You cannot update these Dynamos like you can with Master Dynamo objects.

## Modifying the User Prompts of a Dynamo Instance

### ► To modify the user prompts of a Dynamo Instance:

1. In the iFIX WorkSpace picture, select the Dynamo object.
2. In Classic view, on the Dynamo toolbar, click the Build Dynamo  button.  
-Or-  
In Ribbon view, on the Tools tab, in the Dynamos group, click Dynamos, and then click Build Dynamo.

User Prompts appear in brackets, { }. If the User Prompt has partial substitution, the User Prompt appears in brackets, while static values are represented as asterisks.

3. In the User Prompt fields, modify the entries as necessary. You can delete the brackets when modifying User Prompts.
4. Click OK.
5. To test your changes, double-click the Master Dynamo object to view the Dynamo Properties dialog box and observe the Dynamo Properties column.

## Modifying the User Prompts of a Master Dynamo

### ► To modify the user prompts of a Master Dynamo:

**IMPORTANT:** The only way to modify the user prompts of a Master Dynamo is by manually editing them through the Properties Window, as described below. Do not try to modify the user prompts by using the Build Dynamo wizard. The Build Dynamo wizard only creates a new Master Dynamo and breaks the connection between the selected Master Dynamo and any Instances.

1. In the iFIX WorkSpace system tree, browse to the Dynamo Sets folder. Double-click the folder name to view the contents.
2. In the Dynamo Sets folder, locate the Dynamo Set and Master Dynamo that you want to update.
3. Using the plus (+) symbol, expand the item to locate the Lookup table and view the Easy Dynamo variable.
4. Right-click the EasyDynamo variable that contains the user prompts that you want to update and select Property Window. The Properties window appears.
5. In the CurrentValue field, enter the current value of the user prompt between the quotation marks and the brackets, { }. For example, here you would edit the text MyPrompt to change the user prompt text:  
`ForegroundColor.Blink="{MyPrompt}"`
6. Likewise, in the initialValue field, enter the initial value for the new user prompt between the quotation marks and the brackets.
7. After you finish your changes, save the Dynamo Set.

## Converting Dynamos Using the Quick Dynamo Converter

### ► To convert a legacy Dynamo, or a Dynamo created before iFIX 4.5, using the Quick Dynamo Converter:

1. Open the following:
  - the picture(s) you want to convert
  - the Dynamo set to use for the conversion.
2. Make sure that your picture is active.
3. In Classic view, on the Dynamo toolbar, click the Quick Dynamo Converter button.  
-Or-

In Ribbon View, on the Tools tab, in the Dynamos group, click Dynamos, and then click Quick Dynamo Converter.

4. Select the Dynamo Sets.
5. Select the Master Dynamo. The selected Master Dynamo is highlighted in the Dynamo Set.
6. Select the Group Object(s).
7. Click Run Convert. After a few moments, the Dynamo Converter dialog box displays with an on screen report of the conversion.
8. Click Run Conversion to complete the conversion. A Dynamo Caution message box appears if you did not select the prompt to hide it.
9. Click OK to continue. The progress of the conversion displays in the Status area. If you selected the "Prompt for Choice" option, and any data sources or contained object structures are mismatched between the Master Dynamo and the legacy Dynamos, the Dynamo Converter - Conversion Adjustment Option dialog box appears.
10. If the Dynamo Converter - Conversion Adjustment Option dialog box appears, select an option and click Apply:
  - **Convert to Dynamo but do not update Dynamo** - If you want to convert the Dynamo to a Dynamo object, but do not want to link it to the Master Dynamo. Use this option if you want to use this Dynamo to create a new Master Dynamo.
  - **Convert to Dynamo, then update Dynamo** - If you want to convert the Dynamo to a Dynamo object, and want to link it to the Master Dynamo.
  - **Do not convert to Dynamo** - If you only want to view a report of mismatched Dynamos and make no actual conversions of mismatched Dynamos. Dynamos that are not mismatched are converted.
11. Repeat step 10 each time the Dynamo Converter - Conversion Adjustment Option dialog box appears. This allows you to approve each Dynamo object conversion individually. Otherwise, select an option and click Apply to All to use the same option for all Dynamo object conversions, and review the report later.
12. Review the report, and click Close to exit.

**NOTE:** The Quick Dynamo Converter does not save open pictures after conversion. If you want to save the open pictures, you must do so manually.

## Converting Dynamos Using the Dynamo Converter Wizard

► To convert legacy Dynamos, or Dynamos created before iFIX 4.5, using the Dynamo Converter Wizard:

1. In Classic view, on the Dynamo toolbar, click the Dynamo Converter Wizard button.  
-Or-
- In Ribbon View, on the Tools tab, in the Dynamos group, click Dynamos, and then click Dynamo Converter Wizard.
2. On the Convert Behavior tab, select a conversion adjustment option:
  - **Convert to Dynamo but do not update Dynamo** - If you want to convert the Dynamo to a Dynamo object, but do not want to link it to the Master Dynamo. Select this option if you want to use this Dynamo to create a new Master Dynamo.

- **Convert to Dynamo, then update Dynamo** - If you want to convert the Dynamo to a Dynamo object, and want to link it to the Master Dynamo.
  - **Do not convert to Dynamo** - If you only want to view a report of mismatched Dynamos and make no actual conversions of mismatched Dynamos. Mismatched Dynamos are not converted.
  - **Prompt for Choice** - If you want a prompt to display options, each time a mismatched Dynamo is found. The Prompt for Choice option is the default.
3. Click Next.
4. On the Convert Options tab, if you want to create a log file of the conversion process:
- a. Select the Save Status Trail Info check box.
  - b. If you want to change the default path and file name, enter a path in the Path field.
  - c. To add to an existing log file, select Append.  
-Or-  
To create a new one, select Overwrite.
5. Click Next.
6. On the Select Dynamos tab, in the Dynamo Sets area, select a Master Dynamo that you want to use for the conversion process.
7. On the Select Dynamos tab, in the Pictures area, select the pictures you want to search in.  
-Or-  
Click Select All to select all pictures and all contained group objects.
- NOTES:**
- The Dynamo Converter Wizard allows you to select picture files whether the file is open or closed. During the conversion process, the wizard opens picture files and saves them on close. If a picture is already open, the wizard does not save the picture file, and the file is kept open in the WorkSpace. For these open pictures, you must manually close and save them.
  - If you are using Change Management with iFIX, be aware that pictures need to be checked out (even if closed), otherwise the Dynamo Converter Wizard will not convert these files. If you do not check out the files, the picture files in the Select Dynamos tab appear in red and you are unable to select them.
8. Click Next and, on the View Settings tab, review your settings.
9. Click Run convert. After a few moments the Dynamo Converter Progress dialog box appears with a report of the Dynamos to convert.
- NOTES:**
- If no Master Dynamo or legacy Dynamos from your selection require conversion, the Run Conversion button is unavailable.
  - You can click a legacy Dynamo in the Quick Dynamo Report list to view its name, description, revision number, and associated Master Dynamo information.
10. Click Run Conversion. A Dynamo Caution message box appears if you did not select the prompt to hide it.

11. Click OK to continue. The progress of the conversion displays in the Status area. If there are mismatched between the Master Dynamo and the legacy Dynamo, and you selected the Prompt for Choice option in step 2, the Dynamo Converter - Conversion Adjustment Option dialog box appears.
  12. If the Dynamo Converter - Conversion Adjustment Option dialog box appears, select an option and click Apply:
    - **Convert to Dynamo but do not update Dynamo** - If you want to convert the Dynamo to a Dynamo object, but do not want to link it to the Master Dynamo.
    - **Convert to Dynamo, then update Dynamo** - If you want to convert the Dynamo to a Dynamo object, and want to link it to the Master Dynamo.
    - **Do not convert to Dynamo** - If you only want to view a report of mismatched Dynamos and make no actual conversions.
  13. Repeat step 12 each time the Dynamo Converter - Conversion Adjustment Option dialog box appears. This allows you to approve each Dynamo object conversion individually. Otherwise, select an option and click Apply to All to use the same option for all Dynamo object conversions, and review the report later.
- After a few moments, the Dynamo Converter dialog box displays with an on screen report of the conversion.
14. Review the report, and click Close to exit.

### Converting Dynamo Sets Using the Dynamo Sets Converter

► To convert legacy Dynamo Sets, or Dynamo Sets created before iFIX 4.5, using the Dynamo Sets Converter:

**NOTE:** If you are using Change Management with iFIX, be aware that pictures need to be checked out (even if closed), otherwise the Dynamo Converter Wizard will not convert these files. If you do not check out the files, the picture files in the Select Dynamos tab appear in red and you are unable to select them.

1. In Classic view, click the Convert Dynamo Sets button on the Dynamo toolbar.  
-Or-
- In Ribbon View, on the Tools tab, in the Dynamos group, click Dynamos, and then click Convert Dynamo Sets.
2. Verify that the correct path appears in the Dynamo Set Path field. If not, either use the browse button to locate the correct folder, or enter the path directly in the Dynamo Set Path field.
3. From the Dynamo Sets list box, select the Dynamo Set(s) to convert, or choose Select All to select all Dynamo Sets.
4. Click Convert. The Dynamo Sets Converter Progress dialog box appears.
5. Click Run Conversion. The progress of the conversion displays in the Status area.
6. Click Close.

### Updating a Master Dynamo

► To update a Master Dynamo:

1. Open the Dynamo Set that contains the Master Dynamo object that you want to update. For details, refer to the [Opening Dynamo Sets](#) section.

2. In the Dynamo Set, select the Master Dynamo object.

3. Drag-and-drop the Master Dynamo to an open picture.

**NOTE:** While you can right-click a Dynamo from within the Dynamo Set and select Dynamo Properties to edit overall Dynamo properties, you have limited access to what you can edit within the Dynamo this way. Instead, we recommend editing the Master Dynamo from an open picture, instead.

4. If user prompts are associated with the Dynamo object, the Dynamo Properties dialog box appears. Enter the required information and click OK,

5. In the picture, make the required changes to the Dynamo object you just copied in.

**TIP:** To select a single object within a Dynamo object, with the Dynamo object selected, on the right-click menu, select the Enter Drill-down option. A box appears around the group. Select the object in the group you want to change and make your changes.

6. When finished, deselect the object and the group. The box disappears.

7. Select the Dynamo again, and drag-and-drop the Dynamo back to the same Dynamo Set. The Overwrite Master Dynamo dialog box appears.

8. Select Overwrite the Existing Master Dynamo option.

**NOTE:** If you select the Create a New Master Dynamo instead, all instances created from the old Master Dynamo will no longer be linked to the new Master Dynamo. And, a new Dynamo ID number will be generated.

9. Click OK. The Master Dynamo is updated in the Dynamo Set. You may need to scroll slightly to view the Master Dynamo in the Dynamo Set document.

10. If you want to update the Dynamo Instances in your pictures so that they reflect the new settings in the Master Dynamo, use the steps in the following sections:

- [Updating Dynamo Instances Using the Quick Dynamo Updater](#)
- [Updating Dynamo Instances Using the Dynamo Updater Wizard](#)
- [Updating Dynamo Instances Using the Cross Reference Tool](#)

## Updating Dynamo Instances Using the Quick Dynamo Updater

► To update mismatched Dynamo Instances using the Quick Dynamo Updater:

1. Open the picture(s) you want to update.

Additionally, you can select the specific Master Dynamo(s) that you want to use to update the Dynamo Instances:

- If you want to use a single Dynamo, select the Master Dynamo in the Dynamo set. Only one Dynamo per Dynamo Set can be selected. When nothing is selected, all Master Dynamos in the selected Dynamo Set are used for the update.
- If you want to use one Dynamo from more than one set, select the Master Dynamo in each set. Only one Dynamo per set can be selected for the update.

2. If you want to update the Dynamos on a single picture, select the picture in the iFIX WorkSpace now. Click anywhere in the picture to ensure the title bar is active. Otherwise, proceed to step 2 to update all pictures.
3. In Classic view, on the Dynamo toolbar, click the Quick Dynamo Updater  button.  
-Or-  
In Ribbon view, on the Tools tab, in the Dynamos group, click Dynamos, and then click Quick Dynamo Updater.
4. Select an update option:
  - If you want to update the Dynamo objects on a single, selected picture only, select the *Dynamos on Active Picture* option. If no active pictures are selected in the WorkSpace (for instance, a Dynamo set is selected instead), this option is unavailable.
  - If you want to update the Dynamo objects on all pictures, select the *Dynamos on All Open Pictures* option.
5. Click OK. After a few moments, the Dynamo Updater dialog box displays with an on screen report of the update.
 

**TIP:** You can click a Dynamo Instance in the Quick Dynamo Report list to view its name, description, revision number, and associated Master Dynamo information.
6. Click Run Update to complete the update. A Dynamo Caution message box appears if you did not select the prompt to hide it.
7. Click OK to continue. The progress of the update displays in the Status area. If any data sources are mismatched between the Master Dynamo and the Dynamo Instances, the Dynamo Updater - Update Behavior dialog box appears.
 

**NOTE:** By default, Prompt for Choice is selected as the Update Behavior. You can change the Update Behavior so that you will not be prompted to choose an update action for each mismatched Dynamo Instance. For more information, refer to the [Changing Dynamo Instance Update Options](#) section.

If the Dynamo Updater - Update Behavior dialog box appears, select an option and click Apply:
 
  - **Update the Dynamo, and use Master Dynamo data sources** - If you want to update mismatched Dynamo Instances, but do not want to apply any of the data sources from the Dynamo Instance. This option uses all data sources from the Master Dynamo, and no data sources from the Dynamo Instance.
  - **Update the Dynamo and try to match up the Data Sources** - If you want to update mismatched Dynamo Instances using data sources from the Dynamo Instance and a best guess matching algorithm.
 For example, if a Master Dynamo object contains only one data source (user prompt) based on an animation, but a previous version (an instance of that Dynamo) includes three data sources based on animations, a best guess match is made. For the best guess, iFIX decides which one of the three data sources to use in the instance, and a report is generated based on your settings.
 

If the object type differs between the Master Dynamo and the Instance, there is no attempt to update the data sources in the animation for that object.

  - **Do not update Dynamo** - If you only want to view a report of mismatched Dynamos and make no actual updates.

8. Repeat step 7 each time the Dynamo Updater - Update Behavior dialog box appears. This allows you to approve each Dynamo object update individually. Otherwise, select an option and click Apply to All to use the same option for all Dynamo object updates, and review the report later.
9. Review the report, and click Close to exit.

**NOTES:**

- The Quick Dynamo Updater does not save open pictures after update.
- The Quick Dynamo Updater does not support dynamos with Enhanced Charts.

## Updating Dynamo Instances Using the Dynamo Updater Wizard

► To update mismatched Dynamo Instances using the Dynamo Updater Wizard:

1. In Classic view, on the Dynamo toolbar, click the Dynamo Updater Wizard  button.  
-Or-  
In Ribbon view, on the Tools tab, in the Dynamos group, click Dynamos, and then click Dynamo Updater Wizard.
2. On the Update Behavior tab, select an update option:
  - **Update the Dynamo, and use Master Dynamo data sources** - If you want to update mismatched Dynamo Instances, but do not want to apply any of the data sources from the Dynamo Instance. This option uses all data sources from the Master Dynamo, and no data sources from the Dynamo Instance.
  - **Update the Dynamo and try to match up the Data Sources** - If you want to update mismatched Dynamo Instances using data sources from the Dynamo Instance and a best guess matching algorithm.  
  
For example, if a Master Dynamo object contains only one data source (user prompt) based on an animation, but a previous version (an instance of that Dynamo) includes three data sources based on animations, a best guess match is made. For the best guess, iFIX decides which one of the three data sources to use in the instance, and a report is generated based on your settings.  
  
If the object type differs between the Master Dynamo and the Instance, there is no attempt to update the data sources in the animation for that object.
3. Click Next.
4. On the Update Options tab, if you want to create a log file of the update process, select the Save Status Trail Info check box, and enter a path in the Path field, if you want to change the default path and file name. Select Append to add to an existing log file, or Overwrite to create a new one.
5. Click Next.

6. On the Select Dynamos tab, in the Dynamo Sets area, select the Dynamos that you want to search for. Click Select All to select all Dynamo Sets.
7. On the Select Dynamos tab, in the Pictures area, select the pictures you want to search in. Click Select All to select all pictures.

The Dynamo Updater Wizard allows you to select picture files whether the file is open or closed. During the update process, the wizard opens picture files and saves them on close. If a picture is already open, the wizard does not save the picture file, and the file is kept open in the WorkSpace.

If you are using Change Management with iFIX, be aware that pictures needs to be checked out (even if closed), otherwise the Dynamo Updater Wizard will not update these files. When this happens, the picture files in the Select Dynamos tab appear in red and you are unable to select them.

8. Click Next and, on the View Settings tab, review your settings.
9. Click Launch Updater. After a few moments the Dynamo Updater dialog box appears with a report of the Dynamos to update.

#### **NOTES:**

- The Dynamo Updater Wizard does not support dynamos with Enhanced Charts.
  - If no Dynamo Instances from your selection require updating, the Launch Updater button is unavailable.
  - You can click a Dynamo Instance in the Quick Dynamo Report list to view its name, description, revision number, and associated Master Dynamo information.
10. Click Run Update. A Dynamo Caution message box appears if you did not select the prompt to hide it.
  11. Click OK to continue. The progress of the update displays in the Status area. If any data sources are mismatched between the Master Dynamo and the Dynamo Instances, and you selected the Prompt for Choice option in step 2, the Dynamo Updater - Update Behavior dialog box appears.
  12. If the Dynamo Updater - Update Behavior dialog box appears, select an option and click Apply:
    - **Update the Dynamo, and use Master Dynamo data sources** - If you want to update mismatched Dynamo Instances, but do not want to apply any of the data sources from the Dynamo Instance. This option uses all data sources from the Master Dynamo, and no data sources from the Dynamo Instance.
    - **Update the Dynamo and try to match up the Data Sources** - If you want to update mismatched Dynamo Instances using data sources from the Dynamo Instance and a best guess matching algorithm.

For example, if a Master Dynamo object contains only one data source (user prompt) based on an animation, but a previous version (an instance of that Dynamo) includes three data sources based on animations, a best guess match is made. For the best guess, iFIX decides which one of the three data sources to use in the instance, and a report is generated based on your settings.

If the object type differs between the Master Dynamo and the Instance, there is no attempt to update the data sources in the animation for that object.

- **Do not update Dynamo** - If you only want to view a report of mismatched Dynamos and make no actual updates.
13. Repeat step 11 each time the Dynamo Updater - Update Behavior dialog box appears. This allows you to approve each Dynamo object update individually. Otherwise, select an option and click Apply to All to use the same option for all Dynamo object updates, and review the report later.  
After a few moments, the Dynamo Updater dialog box displays with an on screen report of the update.
  14. Review the report, and click Close to exit.

## **Updating Dynamo Instances Using the Cross Reference Tool**

► **To update mismatched Dynamo Instances using the Cross Reference Tool:**

1. In Classic view, from the WorkSpace toolbar, click the Cross Reference Tool button.

-Or-

In Ribbon view, on the Applications tab, in the Utilities group, click Utilities, and then click Cross Reference Tool.

2. Generate a report with the Quick Report or Report Wizard.

To generate a report with the Quick Report:

- a. From the File menu, select Quick Report.
- b. From the Object Tree, select a picture or a Dynamo Set. This allows you to search a single picture for Dynamos, or all pictures containing Dynamos within a specified set.
- c. Select the Dynamos Option. Click Search.

- Or -

To generate a report with the Report Wizard:

- a. From the Tool menu, select Report Wizard.
- b. Select the Dynamos in Pictures or Pictures Containing Dynamos option.
- c. On the Pictures tab, select the Pictures that you want to search.
- d. On the Dynamo Sets tab, select the Dynamo Sets that you want search for.
- e. Click OK.

If you did not earlier select the prompt to refrain from a reminder message, a message box appears indicating that you cannot access the iFIX WorkSpace when the Cross Reference Tool is running.

3. Click OK to continue. Wait a few moments for a report to generate in the Cross Reference Tool.

**NOTE:** You cannot access the iFIX WorkSpace while the Cross Reference Tool generates a report. After the report completes, you are able to access the iFIX WorkSpace again.

4. On the Tool menu, select Dynamo Updater. The iFIX WorkSpace appears in the foreground and the Dynamo Updater dialog box appears.

5. In the Quick Dynamo Report area, review the Dynamos to be updated and click Run Update. A Dynamo Caution message box appears if you did not select the prompt to hide it.

**TIP:** You can click a Dynamo Instance in the Quick Dynamo Report list to view its name, description, revision number, and associated Master Dynamo information.

6. Click OK to continue. The progress of the update displays in the Status area. If any data sources are mismatched between the Master Dynamo and the Dynamo Instances, the Dynamo Updater - Update Behavior dialog box appears.

**NOTE:** By default, Prompt for Choice is selected as the Update Behavior. You can change the Update Behavior so that you are not prompted to choose an update action for each mismatched Dynamo Instance. For more information, refer to the [Changing Dynamo Instance Update Options](#) section.

7. If the Dynamo Updater - Update Behavior dialog box appears, select an option and click Apply:

- **Update the Dynamo, and use Master Dynamo data sources** - If you want to update mismatched Dynamo Instances, but do not want to apply any of the data sources from the Dynamo Instance. This option uses all data sources from the Master Dynamo, and no data sources from the Dynamo Instance.
- **Update the Dynamo and try to match up the Data Sources** - If you want to update mismatched Dynamo Instances using data sources from the Dynamo Instance and a best guess matching algorithm.

For example, if a Master Dynamo object contains only one data source (user prompt) based on an animation, but a previous version (an instance of that Dynamo) includes three data sources based on animations, a best guess match is made. For the best guess, iFIX decides which one of the three data sources to use in the instance, and a report is generated based on your settings.

If the object type differs between the Master Dynamo and the Instance, there is no attempt to update the data sources in the animation for that object.

- **Do not update Dynamo** - If you only want to view a report of mismatched Dynamos and make no actual updates.
8. Repeat step 7 each time the Dynamo Updater - Update Behavior dialog box appears. This allows you to approve each Dynamo object update individually. Otherwise, select an option and click Apply to All to use the same option for all Dynamo object updates, and review the report later.  
After a few moments, the Dynamo Updater dialog box displays with an on screen report of the update.
  9. Review the report, and click Close to exit.

## Changing Dynamo Instance Update Options

► To change the update options in Dynamo Updater dialog box:

1. Update Dynamo Instances using the:
  - [Quick Dynamo Updater](#)
  - [Dynamo Updater Wizard](#)
  - [Cross Reference Tool](#)

2. When the Dynamo Updater dialog box displays with an on screen report of the update, click Modify to change the Dynamo Update options. The Data Sources Adjustment Options dialog box appears.
3. Select an update option and click OK:
  - Update Dynamo, and use Master Dynamo data sources
  - Update Dynamo, and try to match up data sources
  - Do not update Dynamo
  - Prompt for choice (the default)
4. Click Run Update to complete the update. A Dynamo Caution message box appears if you did not select the prompt to hide it.
5. Click OK to continue. The progress of the update displays in the Status area. If any data sources are mismatched between the Master Dynamo and the Dynamo Instances, the Dynamo Updater - Update Behavior dialog box appears.
6. If the Dynamo Updater - Update Behavior dialog box appears, select an option and click Apply:
  - **Update the Dynamo, and use Master Dynamo data sources** - If you want to update mismatched Dynamo Instances, but do not want to apply any of the data sources from the Dynamo Instance. This option uses all data sources from the Master Dynamo, and no data sources from the Dynamo Instance.
  - **Update the Dynamo and try to match up the Data Sources** - If you want to update mismatched Dynamo Instances using data sources from the Dynamo Instance and a best guess matching algorithm.

For example, if a Master Dynamo object contains only one data source (user prompt) based on an animation, but a previous version (an instance of that Dynamo) includes three data sources based on animations, a best guess match is made. For the best guess, iFIX decides which one of the three data sources to use in the instance, and a report is generated based on your settings.

If the object type differs between the Master Dynamo and the Instance, there is no attempt to update the data sources in the animation for that object.

  - **Do not update Dynamo** - If you only want to view a report of mismatched Dynamos and make no actual updates.
7. Repeat step 6 each time the Dynamo Updater - Update Behavior dialog box appears. This allows you to approve each Dynamo object update individually. Otherwise, select an option and click Apply to All to use the same option for all Dynamo object updates, and review the report later.
8. Review the report, and click Close to exit.

## Working with Dynamo Sets

The following sections describe tasks that you can perform when working with Dynamo Sets:

- [Opening Dynamo Sets](#)
- [Creating New Dynamo Sets](#)

- [Adding a Dynamo Object to a Set](#)

## Opening Dynamo Sets

### ► To open a Dynamo set:

1. In the iFIX WorkSpace system tree, open the Dynamo Sets folder.
2. Double-click the set you want to open. A window opens with the Dynamo Set (.fds file) displayed.

**TIP:** To create a new Dynamo Set to open, in the iFIX WorkSpace, on the Standard toolbar, click the New Dynamo Set button. Add Dynamo objects to the blank document to build the set. Each new Dynamo object that you add to the set becomes a Master Dynamo. Save the Dynamo Set.

## Creating New Dynamo Sets

### ► To create a new Dynamo Set:

1. In Classic view, in the iFIX WorkSpace, on the Standard toolbar, click the New Dynamo Set button.  
-Or-
2. In Ribbon view, click the WorkSpace button, select New, and click Dynamo Set.

## Adding a Dynamo Object to a Set

### ► To add a Dynamo object to a Dynamo Set:

1. In the iFIX WorkSpace, open an existing Dynamo Set or create a new one.
2. Drag-and-drop or copy and paste the Dynamo object you created with the Build Dynamo Wizard into the Dynamo Set.  
If more than one object is selected, the Add Object to Dynamo Sets dialog box appears.
3. If the Add Object to Dynamo Sets dialog box appears, select the Create a New Master Dynamo option and click OK. The Dynamo is added to the set as a Master Dynamo.  
Each new Dynamo object that you add to the set becomes a Master Dynamo.
4. Save the Dynamo Set.

## Using Key Macros

You can create key macros in the iFIX Key Macro Editor (KeyMacroEditor.exe). Key macros allow you to assign a key combination on the keyboard to a specific action in the iFIX WorkSpace that you can execute in operator displays at run time. You can use key macros to automate routine tasks or to group multiple sequential tasks into one function. Some of the functions that you can use key macros for include:

- Customizing navigation through pictures
- Initiating a backup
- Printing a report
- Acknowledging an alarm
- Toggling a digital point
- Controlling database blocks
- Starting other applications

You can associate key macros:

- With shapes or Dynamo objects inside an iFIX picture
- With iFIX pictures
- Across all pictures

For example, you can use one key macro to acknowledge an alarm in a display, and then other key macros to switch views between different pictures of your plant. The key macro feature lets you add custom functionality to objects within a single operator display, to the display itself, or to all operator displays.

This chapter describes how to create and manipulate key macros in the iFIX WorkSpace, using the Key Macro Editor.

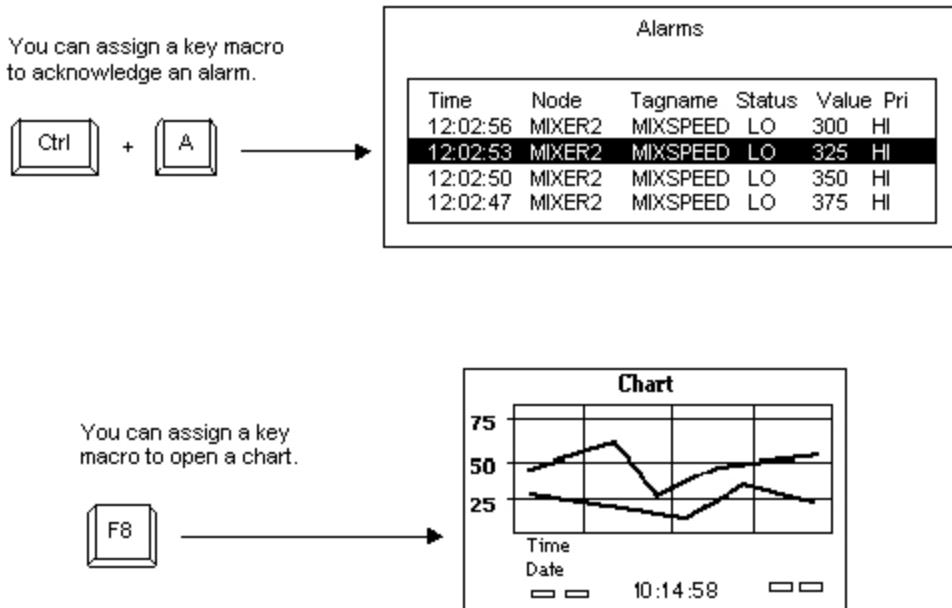
### Do You Need Key Macros?

If the computers that your operators use are located in areas where dust or liquids may be a problem, you may want to use key macros. If your mouse risks getting wet or dirty, you probably won't want to use it on the plant floor. With key macros your operators do not need to use a mouse. Instead, your operators can use regular computer keyboards or heavy-duty industrial keyboards, for instance, that are dust-protected and surface waterproof. Industrial keyboards are used in applications at many pharmaceutical and medical facilities, clean rooms, factories, mining sites, construction sites, chemical facilities, and laboratories.

For example, you might design a series of key macros that open up different pictures of pumps on your plant floor. All that an operator needs to do to monitor pumps at run time is press a key on his industrial keyboard to switch between iFIX pictures, rather than use a mouse to open up each picture manually. Key macros not only save time, but also allow you to easily standardize actions based on specific key-strokes.

Use of key macros, however, is not restricted to users of industrial keyboards. Any user who wants to automate routine tasks, group multiple sequential tasks into one function, manage alarming and operator

messaging, run applications, control database blocks, or manipulate files by the use of a key combination can use key macros. The following figure shows examples of how you might use key macros.



### Key Macro Examples

## Introduction to the Key Macro Editor

The Key Macro Editor gives iFIX users an easy way to create and manipulate key macros in the iFIX WorkSpace. This section describes the Key Macro Editor interface and its basic functionality. Topics included are:

- [Getting Ready to Use Key Macros](#)
- [Starting the Key Macro Editor](#)
- [Recognizing the Key Macro Editor Window](#)
- [Understanding Column Definitions in the Key Macro Editor](#)
- [Using the Toolbar](#)
- [Navigating in the Key Macro Editor](#)
- [Defining User Preferences](#)

## Getting Ready to Use Key Macros

Before you can begin using key macros you must:

- Understand how to create pictures and use experts in the iFIX WorkSpace
- Be familiar with your process database
- Understand how to work with objects in the run-time environment

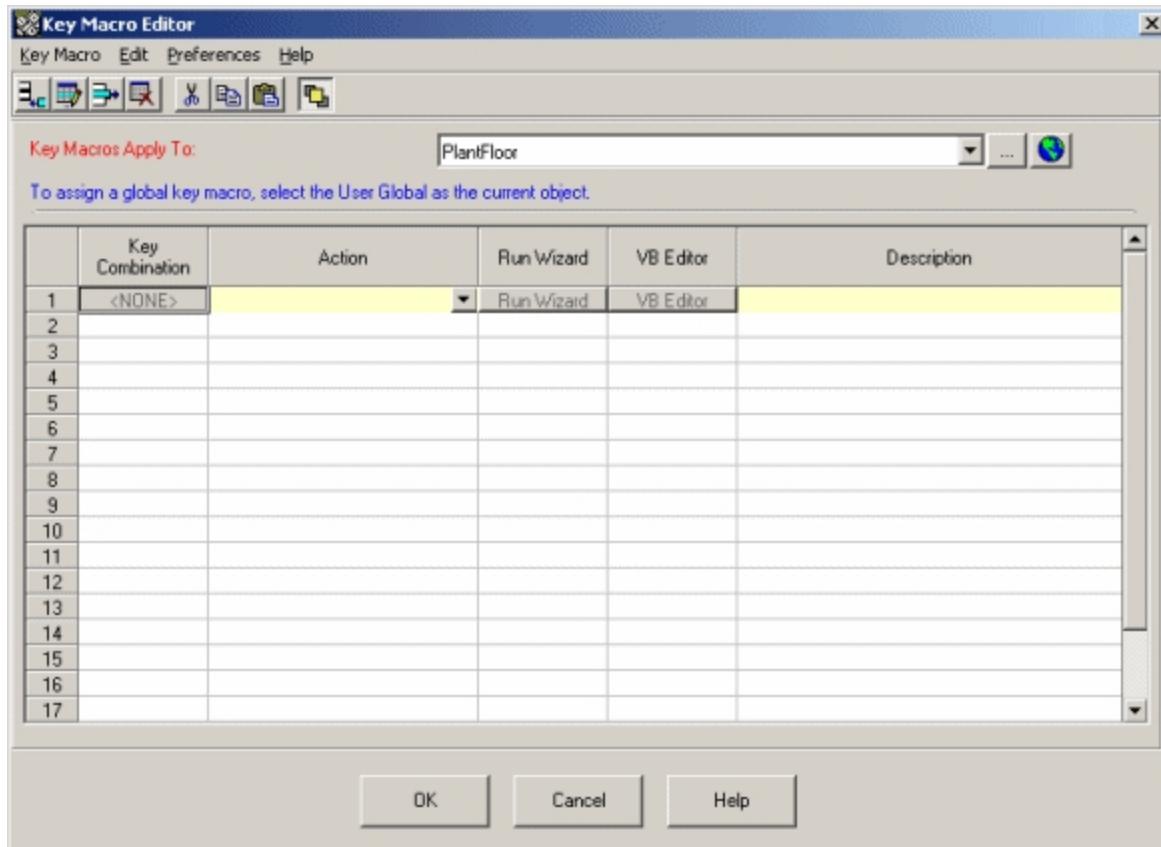
## Starting the Key Macro Editor

You must have the iFIX WorkSpace running before you start the Key Macro Editor. You can start the Key Macro Editor from the iFIX WorkSpace by clicking the Key Macro button on the Application toolbar in configure mode (Classic view) or on the Applications tab in the Utilities group, click Key Macro Editor (Ribbon view).

You can also start the Key Macro Editor by selecting Add or Edit from the Key Macros option in the right-click menu. You access the right-click menu after selecting an object, picture, or user global page. You can select an object or picture from the system tree or drawing area. You can select the user global page from the system tree.

## The Key Macro Editor Window

The Key Macro Editor window appears as follows:



### *Key Macro Editor Main Window*

Initially, the Key Macros Apply To field displays the object, picture, or user global page that was selected when you opened the Key Macro Editor.

### **Column Definitions for the Key Macro Editor**

The following table describes the columns of the Key Macro Editor spreadsheet and the information that you can enter into them.

**NOTE:** You can only access these columns when a row is active. Click a row to make it active.

#### **Column Definitions for the Key Macro Editor**

<b>Use this column...</b>	<b>To...</b>
Key Combination	Define the key assignment for the macro. The key combination can include one key or a combination of keys. For example: F1, Ctrl+A, or Ctrl+Shift+H are all possible key macros.
Action	Define the expert that you want to run for the key macro. The expert automatically launches after you select it from the drop-down list.  An expert consists of a dialog box that requires minimum input to quickly create a script to perform a task. For example, the OpenPicture expert requires you to enter the picture name that you want to open in the dialog box.  If you select Custom, the Microsoft Visual Basic Editor opens so you can enter a custom script.
Run Expert	Re-run the expert defined in the Action cell. You can re-run the expert to modify the expert's parameters.  For example, you can use the Run Expert button to change the name of the picture that is opened with the OpenPicture expert. You do not need to know Visual Basic to run an expert.
VB Editor	Access the Microsoft Visual Basic Editor so that you can view or modify the VBA script behind the key macro.  <b>NOTE:</b> It is highly recommended that you do not modify the code that an expert created because the format of those comments and code written by the expert is used when re-running the expert.
Description	Enter text that describe the function of the key macro. Can contain up to 60 alphanumeric characters, including special characters, such as -(*)&+% and spaces.  The Description field is optional.

### **Using the Toolbar**

Many of the commands found on the menu bar have corresponding toolbar buttons. The following table describes the functions of the Key Macro Editor-specific toolbar buttons.

## Key Macro Editor Toolbar Buttons

Clic-To...

k  
this  
but-  
to-  
n...

-  Add a row to the spreadsheet.
-  Edit the fields in a row.
-  Delete the active row.
-  Delete all rows.
-  Cut the active row or rows, and move them to the Clipboard.
-  Copy the active row or rows, and place them on the Clipboard.
-  Paste a row or rows into the spreadsheet.
-  Keep the Key Macro Editor on top of the iFIX WorkSpace. By default, this button is selected.

## Navigating in the Key Macro Editor

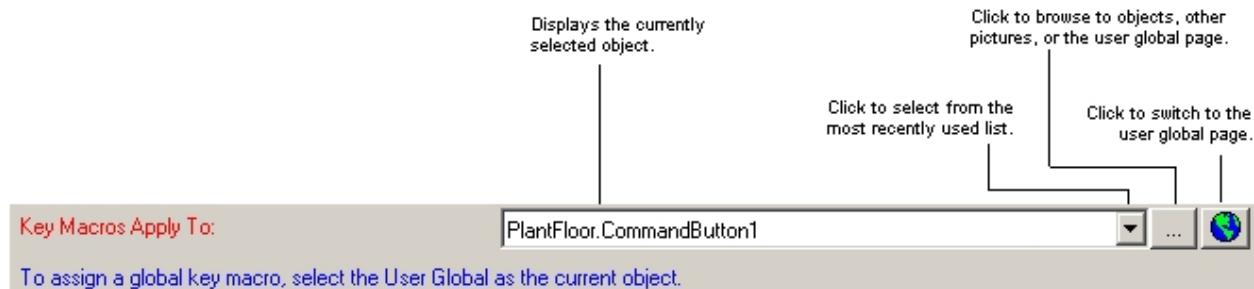
After you open the Key Macro Editor, you can apply key macros to the currently selected item, or navigate to another object, picture, or user global page. To navigate in the Key Macro Editor:

- Use the drop-down list next to the Key Macros Apply To field to view the most recently used shape, picture, or the user global page. The Key Macro Editor stores up to ten items in the most recently used list.

**NOTE:** If you want to modify the number of items that appear in the most recently used list, edit the \\HKEY\_CURRENT\_USER\Software\VB and VBA Program Settings\FDKeyMacros\AddressMRU\MaxEntries values in the Windows Registry.

- Use the browse button to select an object, picture, or user global page.
- Use the Global Key Macros button to switch immediately to the user global page, if you want to define a system wide key macro.

The Key Macros Apply To field and its related buttons are described in the following figure.



## *Key Macros Apply To Field*

### Defining User Preferences

You can define certain features for the Key Macro Editor by using the Preferences menu:

- **Keep on Top** - Keeps the Key Macro Editor on top of the iFIX WorkSpace. By default, Keep on Top is enabled.
- **Always Save User.fgx on Navigate** - Every time you make changes to the user global page and then navigate to a picture or object, you save the changes without being prompted. The User.fgx file contains your system wide key macros. If you do not save the User.fgx file on navigation, global key macros will not be saved to disk until you shut down the WorkSpace. You are prompted to save the User.fgx during the shutdown.
- **Always Save Key Macros on Navigate** - Every time you browse to another shape, picture, or the user global page, you save the key macros that are configured without being prompted. This preference does not save the picture, however. The Always Save Key Macros on Navigate option is a good development tool, if you want to safely design key macros and do not want to modify your pictures until you close the picture or the WorkSpace.

You can have any combination of these preferences enabled at the same time. For instance, you can select Always Save User.fgx on Navigate and Always Save Key Macros on Navigate if you want to enable both in the Key Macro Editor. With both selected, you will not see a prompt asking you to save either the User.fgx file or the key macros since both will be saved automatically.

**NOTE:** These preferences do not automatically save the picture file. You can save the picture file (.GRF file) yourself at any time, or when prompted when you close the picture or the WorkSpace.

### Defining Key Macros

The actions that you can perform with key macros are defined by VBA scripts. Each individual VBA script contains a series of commands and instructions that your iFIX software executes on request. You can use experts to define your actions or write your own custom VBA scripts.

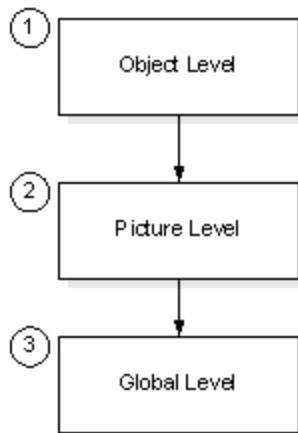
This section describes how to define key macros, including:

- [Understanding How iFIX Checks for Key Macros in Run Time](#)
- [Adding Key Macros](#)
- [Defining a Keystoke Assignment](#)
- [Selecting an Expert](#)
- [Writing Custom Key Macros](#)

### Understanding How iFIX Checks for Key Macros

As the following picture details, when a user enters a key or key combination at run time, iFIX first checks to see if a key macro exists at the object level for the currently selected object. If it does, the

action executes. If the key macro does not exist on the object level, iFIX checks the picture level. If the key macro exists on the picture level, the action executes. If the key macro does not exist on either the object or picture level, iFIX finally checks at the global level.

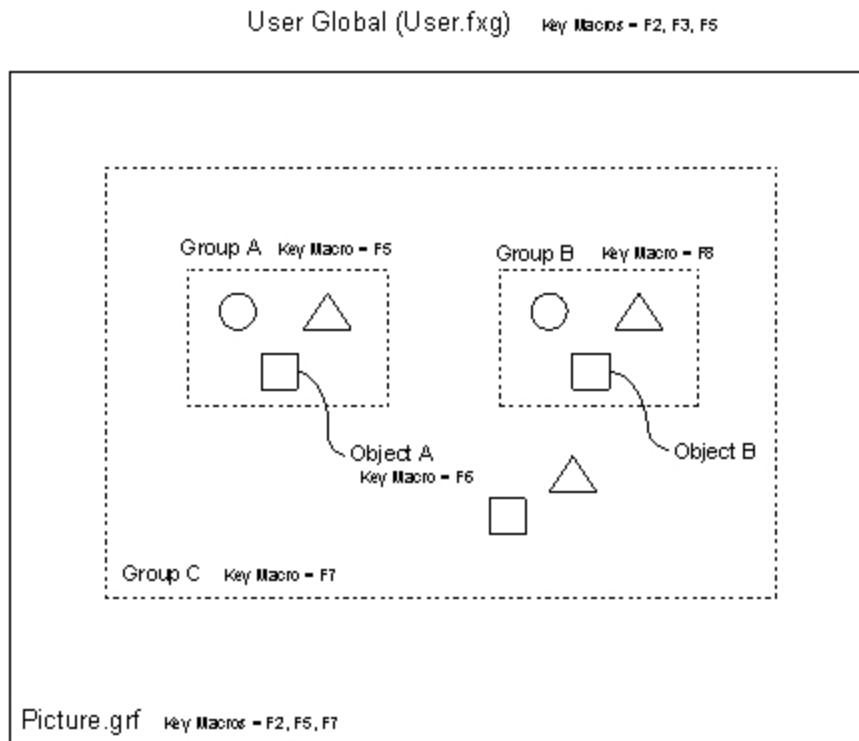


#### *How iFIX Checks for Key Macros*

When you are defining your key macros, keep in mind that object level key macros can override picture and global level key macros. Also, picture level key macros can override global key macros. For example, you can define a global level key macro that executes no matter what picture is open (or even if no picture is open), unless it is overridden by an object or picture level key macro.

For instance, say you define a picture level key macro as F2 to close a picture, and a global level key macro as F2 to replace a picture. When you are in run-time mode and select F2, the close picture key macro will run. The close picture key macro runs because the picture level key macro takes precedence over the global level key macro. So be careful if you are using the same key macro at different levels.

Also, use care if you are assigning key macros to objects within a group. iFIX does not check for key macros at the group level, unless the group is selected. For example, say you are in run time and you select Object A which is inside Group A, and the group contains a key macro of F5, as shown in the following figure. However, the picture also contains a key macro of F5. In this case, if you press F5, the picture's F5 key macro would run, and not Group A's. If instead you select Group A and then press F5, the group's key macro would run and not the picture's. As you can see, if you assign the same key macro to different objects within the same group and to the group itself, the operator could become confused.



#### *Example of Key Macros at Multiple Levels*

As another example, say Group A is part of Group C, as shown in the previous figure. Both Group C and the picture have a key macro of F7 assigned to them. If you are in run time and select Group A and then press F7, the picture's F7 key macro would run and not Group C's. The system does take into account the group hierarchy.

As another example, say Object B is within Group B, and the group contains a key macro of F8 but the object, picture, or user global does not contain a key macro of F8. In this case, if you are in run time and select Object B and then press F8, nothing happens. You would need to select the group before pressing F8 for the key macro to execute. You cannot run a group's key macros by selecting an object within a group. If you are creating Dynamo objects, be sure to keep that in mind.

## Adding Key Macros

To add a key macro in the Key Macro Editor:

- Click in the first empty row of the Key Macro Editor.
- Select Add Row from the Edit menu.
- Click the Add Row button in the toolbar.

The Key Macro Editor allows you to:

- Add a key macro to a shape or a Dynamo object within a picture
- Add a key macro to a picture
- Add a key macro to a user global page

If you add a key macro to a shape or Dynamo object within a picture or to a picture itself, the key macro is saved with the picture file.

If you add a key macro to a user global page, the key macro is available to all displays. Key macros that apply "globally" live in the user global file, User.fgx.

**NOTE:** If you add key macros during run mode, when you switch back to configure mode those key macros are gone.

## Defining a Keystoke Assignment

Each key macro requires a keystroke assignment. This assignment can be a single key or a key combination. A key combination can consist of most keyboard keys including the function keys, number pad, and punctuation keys. The following exceptions are:

- Backspace
- Alt
- Caps Lock
- Spacebar

**NOTE:** Key codes that cannot be applied in the Key Macro Editor can be added using the interface methods.

The Shift or Control keys cannot be used alone. Alphanumeric keys are only valid with Ctrl or Ctrl+Shift.

When you click the Key Combination cell of an active row, you open the Keyboard dialog box, as shown in the following figure.



*Keyboard Dialog Box*

The Keyboard dialog box lets you define a keystroke assignment quickly and easily. Use your mouse to select the keys on the Keyboard dialog box, or enter the key combination in the text box. If you make a mistake, click Clear to start over.

You are not limited to the keys that appear in the Keyboard dialog box. For example, if the keyboard on your computer has an F18 key, when you hit this key the system recognizes and displays it in the text box, even though the key is not included in the Keypad in the Keyboard dialog box. There are some keys

that are not valid though. If you select an invalid key, when you close the Keyboard dialog box, you will get an error message. See the following table for guidelines you can use when defining key macros.

Keystroke Assignment Guidelines	
Key	Guideline
Alphanumeric	<ul style="list-style-type: none"> <li>Do not use alone, or just with the Shift key.</li> <li>Use in combination with the Ctrl or Ctrl+Shift keys.</li> </ul>
Ctrl	<ul style="list-style-type: none"> <li>Do not use alone.</li> <li>When used in a combination, select Ctrl first.</li> <li>Can use in combination with function keys.</li> </ul>
Delete	Use alone or in combination with the Ctrl and/or Shift key.
Function keys	Use alone or in combination with the Ctrl and/or Shift key.
Insert	Use alone or in combination with the Ctrl and/or Shift key.
Arrow keys	Use alone or in combination with the Ctrl and/or Shift key.
Number pad keys	Use alone or in combination with the Ctrl and/or Shift key.
Punctuation keys	<ul style="list-style-type: none"> <li>Do not use alone.</li> <li>Use in combination with the Ctrl or Ctrl+Shift keys.</li> </ul>
Shift	<ul style="list-style-type: none"> <li>Do not use alone.</li> <li>When used in a combination, select Shift first.</li> <li>Use in combination with function, symbol, punctuation, movement, Insert, or Delete key.</li> <li>Do not use in combination with alphanumeric keys, unless used with the Ctrl key.</li> </ul>
Symbols	Use alone or in combination with the Ctrl and/or Shift key.

## Selecting an Action

Select an action for a specified key macro by doing one of the following:

- Click the Run Wizard button to use the Multiple Command Script Wizard.
- Click the VB Editor button to open the Visual Basic Editor.

The Multiple Command Script Wizard enables you to use Experts to automatically create a scripted action, or series of actions, for the key macro. Alternatively, you can use the Visual Basic Editor to create a custom scripted action.

The following Experts are available for use with key macros through the Multiple Command Script Wizard:

- Custom
- AcknowledgeAlarm
- AcknowledgeAllAlarms
- AlarmHorn
- CloseDigitalPoint

- ClosePicture
- DataEntry
- DisableAlarm
- EnableAlarm
- LocateObject
- GenerateReport
- OpenDigitalPoint
- OpenPicture
- RampAValue
- ReplacePicture
- SetTagAuto
- SetTagManual
- ToggleDigitalPoint
- ToggleScan
- ToggleTagAutoManual
- TurnTagOffScan
- TurnTagOnScan
- WriteToADatabasePoint

For information on particular Experts, refer to the [Experts Summary](#).

## Writing Custom Key Macros

You can use your Visual Basic Editor to write a custom script or edit an existing expert configuration for a key macro. Editing expert code is only recommended for advanced users. If you want to modify the expert parameters, we suggest that you re-run the expert rather than edit the code. Use the Run Expert button to modify these parameters.

**NOTE:** If you modify the expert generated code, you should delete the Expert generated comments in the VBA script.

For information on the VBA scripts and Experts, refer to the following sections:

- [Writing Scripts](#)
- [iFIX Automation Reference](#)
- [Experts Summary](#)

## Managing Macros

The Key Macro Editor provides the tools necessary to manage and refine key macros. You can use these tools to:

- Create Global Key Macros.
- Automatically Save the User.fgx when navigating.
- Delete a key macro.
- Delete all key macros for an object, picture, or user global.
- Export all key macros in the selected object, picture, or user global page to a .CSV file.

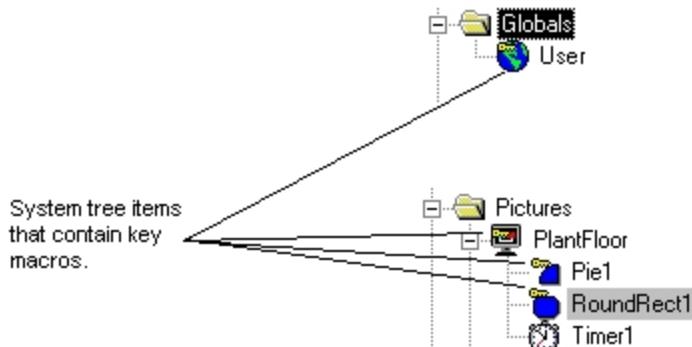
**NOTE:** There is no import functionality in this release.

In addition, you can also manage key macros in the WorkSpace by:

- Copying and pasting key macros from one object to another object.
- Copying and pasting key macros from one picture to another picture.
- Copying and pasting an object containing key macros.

### Determining if an Object, Picture, or User Global Contains a Key Macro

If an object, picture, or user global contains a key macro, it is identified by a key at the top left-hand corner of the icon in the system tree. See the following figure for an example.



*Example of Key Macros, as Displayed in the System Tree*

### Overriding WorkSpace Shortcuts in Run Time

Key macros override shortcut keys that you can normally use in the WorkSpace's run-time environment. For example, you can override the WorkSpace shortcut of Ctrl+O to open a picture with a key macro that does another function when you select Ctrl+O. You can also disable a shortcut by creating an empty key macro. For example, if you don't want to give operators the ability to open pictures, you create an empty key macro for the Ctrl+O key combination. This disables the action for the key combination, not the key macro itself. So, when the operator presses Ctrl+O, nothing happens.

To create an empty key macro in the Key Macro Editor, you select Custom in the Action drop-down. This functionality is different from the VBA Key Up/Key Down events that only have access to key combinations not used by the WorkSpace.

**NOTE:** When you create a key macro for Ctrl+F4, a user logged in as guest may not be able to use Ctrl+F4 as expected. To overcome this restriction, assign the Enable Task Switching application feature to that user's account.

## Tips And Tricks

Some of the additional functionality provided with key macros include:

- Right-click on an object or picture from the system tree or drawing area, or right-click the user global page from the system tree to display a menu with the Key Macros option.

**NOTE:** The Key Macros option is not available in the right-click menu for variable, timer, or event objects.

- Determine if an object, picture, or user global contains a key macro by looking at the System Tree.
- Search and replace for a key macro within a picture.
- Search and replace for a key macro within a user global.
- Copy all key macros for an object.

## Notes for Users Familiar with the FIX Product

If you are familiar with the FIX product line and have used key macros before, there are a few things that you should be aware of in the latest iFIX release:

- The User Interface to the Key Macro Editor is re-designed both visually and functionally.
- Key macros are now object-based, as well as picture-based and global-based.
- The Key Macro Apply To field allows you to select a user global by clicking the Global Key Macros button. If you add a key macro to a user global page (User.fgx file), the key macro is available to all displays.
- You can now use the F10 key for key macros.

**NOTE:** Unless you enable task switching, the key macro Shift+F10 will not work.

- Key macros are only functional in the run-time environment.
- Key macros are saved with pictures and the user file (User.fgx), and not in a separate .KMX file.
- If you copy and paste an object that contains key macros, the key macros are copied and pasted along with the object.

## Key Macro Editor Dialog Boxes

The Key Macro Editor includes the following dialog boxes (listed in alphabetical order):

- [Key Macro Editor Main Window](#)
- [Keyboard Dialog Box](#)

## Key Macro Editor Main Window

The Key Macro Editor main window displays the following items:

### Key Macros Apply To

Enter the object, picture, or user global page to which you want to apply key macros. You can type the name directly into the Key Macros Apply To field or you can:

- Click the drop-down arrow next to the Key Macros Apply To field to select from the most recently used list.
- Click the browse button to open the browse box to select another object, picture, or the user global page.
- Click the Global Key Macros button to apply key macros to the user global page.

### Spreadsheet

Click in any cell in the spreadsheet to enter data:

- Key Combination - Defines the key assignment for the macro. Can include one or multiple keys.
- Action - Defines the expert that you want to run for the key macro. The expert automatically launches after you select it. If you select Custom, the Microsoft Visual Basic Editor opens so you can enter a custom script.
- Run Expert - Button that re-runs the expert defined in the Action cell so you can modify the expert's parameters.
- VB Editor: Button that provides access to the Microsoft Visual Basic Editor so that you can view or modify the VBA script behind the key macro.

**NOTE:** It is highly recommended that you do not modify the code created by an expert because the expert's code is used when re-running the expert.

- Description - Text that describes the function of the key macro. Can contain up to 60 alpha-numeric characters, including special characters, such as -(\*)&+% and spaces. The Description field is optional.

## Keyboard Dialog Box

In the Keyboard Dialog Box use the mouse to select keys on the Keyboard dialog box, or enter the key combination in the text box.

A key combination can consist of most keyboard keys except: Backspace, Alt, Caps Lock, or the Spacebar. The Shift or Control keys cannot be used alone. Alphanumeric keys are only valid with Ctrl or Ctrl+Shift.

## How Do I...

The following sections provide steps on how to use iFIX Key Macro Editor:

- [Managing Key Macros](#)
- [Navigating in the Key Macro Editor](#)
- [Copy and Paste Macros](#)
- [Tips and Tricks](#)

### Managing Key Macros

The following sections provide steps to help you manage your key macros when working in the iFIX WorkSpace:

- [Adding a Key Macro](#)
- [Copy and Paste a Row in the Key Macro Editor](#)
- [Creating Global Key Macros](#)
- [Defining a Keystroke Assignment](#)
- [Deleting a Key Macro](#)
- [Deleting All Key Macros](#)
- [Exporting to a .CSV File](#)
- [Selecting an Action](#)

#### Adding a Key Macro

► To add a key macro:

1. In Classic view, in the iFIX WorkSpace, click the Key Macro Editor button.  
-Or-
2. Click in the first empty row of the spreadsheet.
3. Click the Key Combination cell to define the keystrokes for the key macro.
4. Select an action from the drop-down list.
5. Optionally, in the Description field, enter a description of the key macro.
6. Click OK.

#### Copy and Paste a Row in the Key Macro Editor

► To copy and paste a row in the Key Macro Editor:

1. In the iFIX Key Macro Editor main window, click anywhere in the row of the key macro that you want to copy.  
**NOTE:** If you want to copy multiple rows, hold the Shift key while you click the rows that you want to copy. To select multiple rows that are not located next to each other, hold the Ctrl key while you click each row.
2. On the Edit menu, click Copy Row.
3. Browse to the object, picture, or user global page to which you want to paste the key macros.
4. On the Edit menu, click Paste Row.

## Creating Global Key Macros

► To create global key macros:

1. From the iFIX Key Macro Editor main window, click the Global Key Macros button.
2. Define your keystroke assignment, assign an action, and enter a description.
3. Click OK.

**NOTE:** Global key macros are saved in the user global file, User.fwg.

## Defining a Keystroke Assignment

► To define a keystroke assignment:

1. From the iFIX Key Macro Editor main window, click the Key Combination cell in an active row. The Keyboard dialog box appears.
2. Use the mouse to select keys on the Keyboard dialog box, or enter the key combination in the text box. You are not limited to the keys that appear just in the Keyboard dialog box.

For example, if the keyboard on your computer has an F18 key, when you hit this key the system recognizes and displays it in the text box, even though the key is not included in the Keypad in the Keyboard dialog box.

**NOTE:** A key combination can consist of most keyboard keys except: Backspace, Alt, Caps Lock, or the Spacebar. The Shift or Control keys cannot be used alone. Alphanumeric keys are only valid with Ctrl or Ctrl+Shift.

3. Click OK.

## Deleting a Key Macro

► To delete a key macro:

1. In the iFIX Key Macro Editor main window, click anywhere in the row of the key macro that you want to delete.
2. On the Key Macro menu, click Delete Row.

**NOTE:** If you want to delete multiple key macros, hold the Shift key while you click the rows that you want to delete. To select multiple rows that are not located next to each, hold the Ctrl key while you click each row. A confirmation message box appears if more than one row is highlighted when deleting.

## Deleting All Key Macros

► **To delete all key macros for a given object, picture, or user global page:**

1. In the iFIX Key Macro Editor main window, on the Key Macro menu, click Delete All Rows. A confirmation message box appears.
2. Click Yes to continue.

## Exporting to a .CSV File

► **To export to a .CSV file:**

1. In the iFIX WorkSpace, from the system tree or drawing area, click the object, picture, or user global page from which you want to export key macros.
2. In Classic view, on the iFIX WorkSpace toolbar, click the Key Macro Editor button.  
-Or-  
In Ribbon View, on the Applications tab in the Utilities group, click Key Macro Editor.
3. On the Key Macros menu, click Export.

**NOTE:** You cannot import .CSV files. The exported .CSV file is intended to be used for cross-referencing key macros in Excel.

By default the Recursive (Include Children) check box is selected. This allows you to include key macros for all pictures and objects if you select the user global page, or all objects within a picture and the selected picture if you select a picture.

4. In the File Name field, enter a path and name for the .CSV file. If you do not include a path, the .CSV file is saved to your iFIX directory.  
If you enter or browse to an existing file name and click the Append to File check box, the key macros are added to the end of the existing .CSV file.
5. Click Export.

## Selecting an Action

**NOTE:** You must have a key combination defined before you can select an action.

► **To select an action with the Multiple Command Script Wizard:**

1. In the iFIX Key Macro Editor main window, click the Run Wizard button. The Multiple Command Script Wizard appears.

2. Choose a command from the Select Action to Append list. The Expert associated with the command you chose appears.
3. Complete the Expert with your desired settings and information.
4. Optionally, repeat steps 2 and 3 if you want to add additional commands to your scripted command sequence.
5. When you have finished choosing your command sequence, click OK.

► **To select an action with the Visual Basic Editor:**

1. In the iFIX Key Macro Editor main window, click the VB Editor button. The Visual Basic Editor appears.
2. Create your custom script in the VB Editor, then click OK.

For more information on the Multiple Command Script Wizard, see [The Multiple Command Script Wizard](#). For more information on creating custom scripts, see the [iFIX Automation Interfaces](#) Help.

## [Copying and Pasting Macros](#)

In the Key Macro Editor you can do the following:

- [Copy and Paste Between Objects in a Picture](#)
- [Copy and Paste Between Pictures](#)
- [Copy and Paste Whole Objects in a Picture](#)

### **Copy and Paste Between Objects in a Picture**

► **To copy and paste key macros between objects:**

1. In the iFIX WorkSpace, from the system tree or drawing area, right-click the object that contains the key macros that you want to copy. A pop-up menu appears.
2. On the Key Macros menu, click Copy to copy all key macros for the object.
3. Right-click the object to which you want to copy the key macros. A pop-up menu appears.
4. On the Key Macros menu, click Paste.

### **Copy and Paste Between Pictures**

► **To copy and paste key macros between pictures:**

1. In the iFIX WorkSpace, in the system tree, right-click the picture that contains the key macros that you want to copy. A pop-up menu appears.
2. On the Key Macros menu, click Copy.
3. Right-click the picture to which you want to copy the key macros. A pop-up menu appears.
4. On the Key Macros menu, click Paste.

**NOTE:** When you copy and paste key macros between pictures, you copy and paste those at the picture level and not at the object level.

## Copy and Paste Whole Objects in a Picture

► To copy and paste objects with key macros:

1. In the iFIX WorkSpace, from the system tree or drawing area, select the object.
2. Hold the Control key down and drag and drop the object to the desired location. The pasted the object brings the key macros with it.

**NOTE:** You can copy and paste objects when the source and destination do not appear on the screen simultaneously, by using the right-click menu.

## Navigating in the Key Macro Editor

The following sections describe how to navigate within the Key Macro Editor:

- [Browsing in the Key Macro Editor](#)
- [Selecting a Key Macro from the Most Recently Used List](#)
- [Selecting the User Global Page](#)
- [Saving Key Macros When Navigating](#)
- [Saving the User.fwg File When Navigating](#)

## Browsing in the Key Macro Editor

► To browse to another object, picture, or user global page in the Key Macro Editor:

1. In the iFIX Key Macro Editor main window, click the browse button next to the Key Macros Applies To field.
2. Select the object, picture, or user global page to which you want to apply key macros.
  - Click the plus sign next to a picture to view the objects contained in the picture.
  - Click the minus sign next to a picture to collapse the expanded view.
3. Click OK.

## Selecting a Key Macro from the Most Recently Used List

► To select a key macro from the most recently used list in the Key Macro Editor:

1. In the iFIX Key Macro Editor main window, click the drop-down arrow next to the Key Macros Apply To field. A list box opens with the most recently used items.

2. Select a shape, picture, or the user global page from the most recently used list.

**NOTE:** Up to ten items are stored in the most recently used list.

## Selecting the User Global Page

► To select the user global page in the Key Macro Editor:

1. In the iFIX Key Macro Editor main window, click the Global Key Macros button. The word User appears in the Key Macros Apply To field.
2. Enter your key macros for the user global page.

## Saving Key Macros When Navigating

► To save key macros automatically when navigating:

1. In the iFIX Key Macro Editor main window, on the Preferences menu, click Always Save Key Macros on Navigate.
2. Be sure that a check mark appears next to the Always Save Key Macros on Navigate option in the Preferences menu.

## Saving the User.fxg File When Navigating

► To automatically save the User.fxg file when navigating:

1. In the iFIX Key Macro Editor main window, on the Preferences menu, click Always Save User.fxg on Navigate.
2. Be sure that a check mark appears next to the Always Save User.fxg on Navigate option in the Preferences menu.

## Using Tips and Tricks

The following sections provide tips and tricks for working with the iFIX Key Macro Editor:

- [Adding a Key Macro Button to the Toolbar](#)
- [Copy and Paste All Key Macros for an Object](#)
- [Viewing Key Macros in the System Tree](#)
- [Disabling a Key or Key Combination](#)
- [Exporting Key Macros Without Launching the Key Macro Editor](#)
- [Searching Within a Picture](#)
- [Searching Within the User Global Page](#)

## **Adding an Export Key Macro Button to the Toolbar**

### **► To add an Export Key Macros button to the toolbar:**

1. In Classic view, in the iFIX WorkSpace, click Toolbars.
- Or-
- In Ribbon view, on the Home tab, in the WorkSpace group, click Settings, and then click Toolbars.
2. Click the Customize button.
3. Click the Buttons tab.
4. In the Categories list, select Picture Tasks.
5. Drag the Export Key Macros button from the Customize Toolbars dialog box to the toolbar.
6. Click the Close button.

## **Copy and Paste All Key Macros for an Object**

### **► To copy and paste all key macros for an object:**

1. In the iFIX WorkSpace, from the system tree or drawing area, right-click the object that contains the key macros that you want to copy. A pop-up menu appears.
2. On the Key Macros menu, click Copy.
3. Right-click the object, picture, or user global to which you want to paste the key macros. A pop-up menu appears.
4. On the Key Macros menu, click Paste.

## **Viewing Key Macros in the System Tree**

### **► To determine where key macros exist from the WorkSpace system tree:**

1. In the WorkSpace system tree, look for a key in the upper left corner of the object, picture, or user global page icon.
2. If you want to view or add key macros, click the object, picture, or user global page and open the Key Macro Editor.

## **Disabling a Key or Key Combination**

► To disable a key or key combination:

1. In the iFIX Key Macro Editor main window, click the Key Combination cell in an active row. The Keyboard dialog box appears.
2. Use the mouse to select the key or key combination that you want to deactivate.
3. Click OK.
4. Click Custom from the Action drop-down list. The Microsoft Visual Basic Editor launches.
5. If a script was previously defined for the key or key combination, comment out the contents of the script and save the script.

**NOTE:** Do not comment out the procedure's declaration if you want the key to be handled. If you do, the key macro will be removed.

By commenting out the contents of the script, you are disabling the action for the key or key combination, not the key macro itself. This functionality is different from the VBA Key Up/Key Down events that only have access to key combinations not used by the WorkSpace.

6. If no script was previously defined for the key or key combination, do not enter a new script.
7. On the File menu, click Close and Return to WorkSpace Application. This closes the Visual Basic Editor and returns you to the Key Macro Editor main window.
8. Optionally, when you return to the Key Macro Editor main window, you can enter a description for the key macro.

## Exporting Key Macros Without Launching the Key Macro Editor

► To export key macros without launching the Key Macro Editor:

1. In the iFIX WorkSpace, from the system tree or drawing area, click the object, picture, or user global page from which you want to export key macros.
2. Click the Export Key Macros button on your toolbar.

**NOTE:** The Export Key Macros button is a custom toolbar option. If it does not display in your toolbar, you will need to add it.

The Export Key Macros dialog box appears. By default the Recursive (Include Children) check box is selected. This allows you to include key macros for all pictures and objects if you select the user global page, or all objects within a picture and the selected picture if you select a picture.

3. In the File Name field, enter a path and name for the .CSV file. If you do not include a path, the .CSV file is saved to your iFIX directory.

If you enter or browse to an existing file name and click the Append to File check box, the key macros are added to the end of the existing .CSV file.

4. Click Export.

## Searching Within a Picture

► To search for a key macro within a picture:

1. From the iFIX WorkSpace system tree, click the picture in which you want to search for key macros.
2. On the Edit menu, click Find and Replace. The Find and Replace dialog box appears.
3. In the Find What field, enter the key or key combination that you want to search for.
4. Select the Include Scripts check box.

You need to select Include Scripts so that Procedure Declaration and Display String properties for key macros appear in the match list. Both properties are used in key combinations.

5. Click the Find button.

**NOTE:** Do not use the replace feature, unless you are an advanced user. For example, if you replace a key combination with one that exists already, you will cause a compiler error.

## Searching Within the User Global Page

► To search for a key macro within the user global page:

1. From the iFIX WorkSpace system tree, within the Globals folder, click the User item.
2. On the Edit menu, click Find and Replace. The Find and Replace dialog box appears.
3. In the Find What field, enter the key or key combination that you want to locate.
4. Select the Include Scripts check box.

You need to select Include Scripts so that Procedure Declaration and Display String properties for key macros appear in the match list. Both properties are used in key combinations.

5. Click the Find button.

**NOTE:** Do not use the replace feature, unless you are an advanced user. For example, if you replace a key combination with one that exists already, you will cause a compiler error.

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