GE VERNOVA

PROFICY® SOFTWARE & SERVICES

PROFICY iFIX HMI/SCADA

Creating High Performance Pictures

GE VERNOVA

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doc@ge.com

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Creating High Performance Pictures

High-performance HMI displays provide information to operators in a concise and effective way that maximizes their ability to assess the state of a process. By minimizing visual distractions and irrelevant information, operators can more readily determine what actions they need to take. iFIX provides graphic tools including dynamos, a high-performance color palette, and a Web_HMI Toolbox that are designed to help you create pictures that follow industry guidelines for High-Performance HMI. The use of high performance graphic tools and settings are recommended for pictures intended for export to Proficy Operations Hub. However, you can take advantage of high performance tools and design principles when designing your traditional iFIX pictures as well.

You can export and save Proficy Operations Hub picture files to a folder. The exported files are in JavaScript Object Notation (JSON) format. When these exported files are uploaded to the Proficy Operations Hub server, they can be viewed in the Proficy Operations Hub browser client.

Once you have installed iFIX with support for Proficy Operations Hub and high performance graphics, a Operations Hub group appears in WorkSpace in the Tools tab in Ribbon view. The Operations Hub group contains two buttons to help you create and export Operations Hub pictures. In addition, high performance Dynamos are installed to help you create simple, concise graphics with minimal effort. For more information on using iFIX with support for Proficy Operations Hub, refer to the Creating Pictures for Export to Proficy Operations Hub section.

NOTE: This documentation assumes you are familiar with the traditional iFIX help and picture creation methods and tools. For more information, refer to the Creating Pictures e-book.

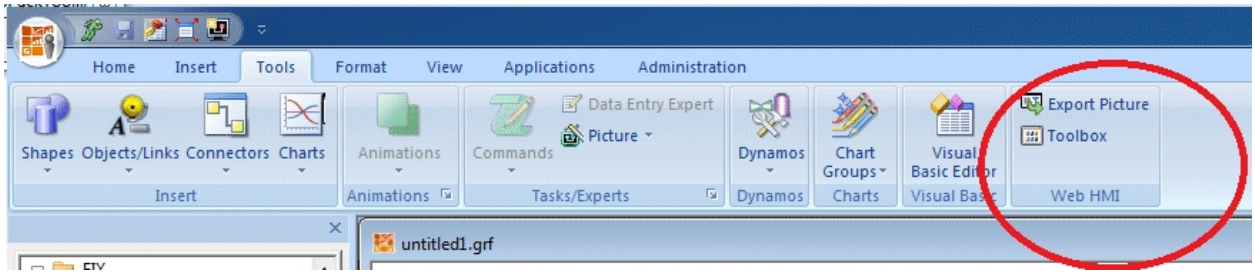
Understanding GE Operations Hub Pictures

iFIX, with support for Proficy Operations Hub and high-performance graphics, delivers the necessary components to create high-performance Operations Hub graphics to display in the Proficy Operations Hub browser client. As with traditional iFIX pictures, Proficy Operations Hub pictures include objects and data sources that represent your process. You create Proficy Operations Hub pictures by inserting and manipulating objects and data sources in your pictures. Not all objects that are supported in traditional iFIX pictures are supported in Proficy Operations Hub pictures. For example, Proficy Operations Hub supports line elements but does not support pipe elements. For more information on Proficy Operations Hub object support, refer to the Proficy Operations Hub Element Support section.

To create and optimize high performance graphics, the high-performance HMI Graphics check box in the User Preference - General Tab dialog box must be enabled (default). This sets the high-performance color box as the default color palette, and also sets the high-performance shape, color, and font settings.

Once iFIX with support for Proficy Operations Hub and high-performance graphics is installed, the following Operations Hub buttons appear in Ribbon view in the Operations Hub group of the Tools tab in WorkSpace:

- Toolbox
- Export Picture



The Toolbox contains objects, animations, and picture creation tools as described in the Using the Web_HMI Toolbox section. This Toolbox also provides a high-performance color box you can use to enhance your iFIX pictures. For more information on the color box, refer to the Using the High-Performance Color Box section.

Once you create and save the picture, use the Export Picture button to export the file to a default folder or a folder location of your choosing. This folder contains corresponding log and zip files for each file exported. For more information, refer to the Exporting Proficy Operations Hub Pictures section.

Proficy Operations Hub Element Support

The following sections provide a listing of objects that the Proficy Operations Hub client does and does not support.

Supported Proficy Operations Hub Elements

- Shapes (rectangle, rounded rectangle, oval, chord, polygon, pie, arc, line, polyline, line connector, and right angle line connector)

  IMPORTANT: Scripting, pipes, and pipe connectors are not supported. For more information on unsupported elements, refer to the Unsupported Elements section.

- Bitmaps (are converted to .png files during export)
- The `IsSelectable` Property is exported for group objects. When set to `True`, it indicates the ability to control one or more data sources associated with objects contained in the group. For more information, refer to the Controlling Data Sources in a Picture section.
- Groups
- Datalink including Historical Datalink
- Animations
  - Fill - vertical and horizontal
  - Rotate (not supported for Rounded Rectangles and Ovals)
  - Color Foreground/Background/Edge
  - Visibility
- Text (the default is GE Inspira font, 12 points)
- Dynamos

- Expressions (simple and complex)
- iFIX or Historian data sources or references to model properties

You can find additional information on using supported elements in the Creating Pictures ebook.

Unsupported Proficy Operations Hub Elements

- Scripting
- Pipe objects and pipe connectors
- Push Button
- OLE objects and ActiveX controls
- Variable
- Timer
- Event
- Time
- Date
- Alarm Summary
- Chart
- Linear Animation of scale and position
- Experts (open picture, close picture, replace, picture, refresh picture, and data entry)
- VisionX Controls (data, grid, list box, and combo box)
- Animating objects using another object's properties
- Data Sources that are not FIX32 or Historian data sources

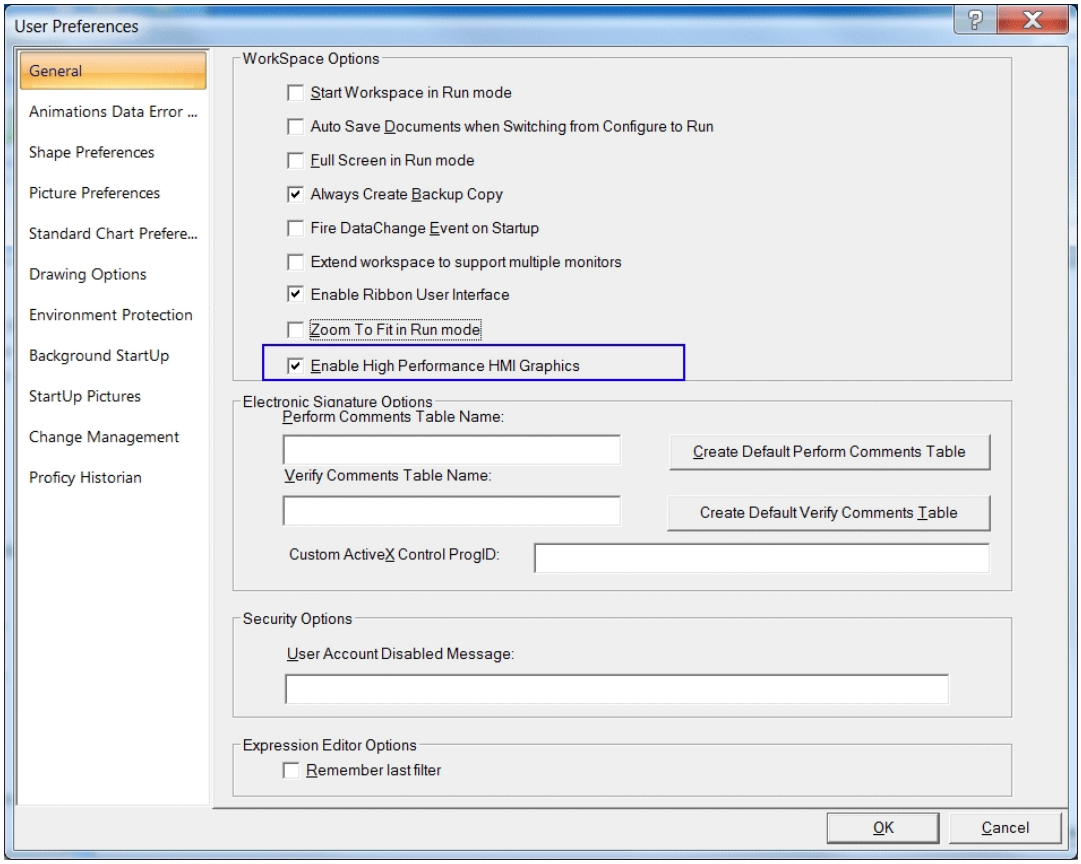
Enabling High Performance Graphics in iFIX

The User Preferences - General Tab dialog box provides a check box to enable or disable high performance HMI graphics as shown in the following illustration. By default, this check box is enabled when you first start WorkSpace.

Enabling this check box helps you to create high performance pictures for export to the GE Operations Hub client or iFIX pictures that use colors and graphic settings that are optimized for high performance. High performance pictures include default settings for the following:

- High performance color box
- GE Inspira font (12 points)
- High performance shape foreground colors

For more information on the User Preferences - General tab, refer to the Understanding iFIX ebook.



Creating Pictures for Export to Proficy Operations Hub

To create a new iFIX high performance picture for export to Proficy Operations Hub, use the Web_HMI Toolbox to select objects and to configure animations. The Web_HMI Toolbox includes only those objects and experts that are supported for export to Proficy Operations Hub pictures. If you use an existing picture, unsupported objects and scripts are not exported. The log file that is generated during the JSON export lists those elements that were not exported. Therefore, it is recommended that you create new pictures for your Proficy Operations Hub environment in order to avoid reworking existing pictures.

The Web_HMI Toolbox can be toggled on and off by clicking the Toolbox button found on the Tools tab in the Operations Hub group of the WorkSpace ribbon. Once enabled, you can use any of the Web_HMI Toolbox elements to create your pictures. For more information on the toolbox, refer to the Using the Web_HMI Toolbox sections.

The elements in the Toolbox (and Dynamos) are designed to use the high-performance Color Box (palette). This color box contains the colors you need to assign high-performance HMI color to objects in your pictures. For more information on the color box, refer to the Using the High-Performance Color Box section.

You can configure animations in your high-performance pictures. Animations can be configured to use iFIX tags, Historian tags, or model references from your Operations Hub model. Model references entered manually in the data sources field of the animation **must** begin and end with an @ (at sign). For example, to use the value of the model reference Pump1.Speed, enter @Pump1.Speed@ in the data

source of the animation expert. For more information on creating animations, refer to the Creating Pictures ebook.

IMPORTANT: Even though the model reference in the data source for Operations Hub pictures may look the same as the iFIX "tag group symbol," Operations Hub does NOT need or use tag groups.

In addition, you can modify a data source within a picture using the group object's `IsSelectable` property. When a data source is contained in a group object with the `IsSelectable` property set to `True`, you can click on the group in the display and enter a new value. This new value is written to the database. For more information on controlling data sources, refer to the Controlling Data Sources in a Picture section.

iFIX, with support for Proficy Operations Hub, also provides pre-built high performance Dynamos. Use these Dynamos to create a consistent design in your high-performance pictures. For a description of these high-performance Dynamos, refer to the Using High-Performance Dynamos section.

Using the Web_HMI Toolbox

The Web_HMI Toolbox contains buttons for objects and picture composition tools that allow you to quickly create high performance HMI pictures. You can click and drag the Web_HMI Toolbox to a position anywhere on your picture, or click and drag one of its edges to resize it.

The Web_HMI Toolbox automatically appears by default when high performance HMI graphics are enabled in the User Preferences - General Tab dialog box.

You can disable the Web_HMI Toolbox by toggling the Toolbox button on the Tools tab in the Operations Hub group of the WorkSpace ribbon.

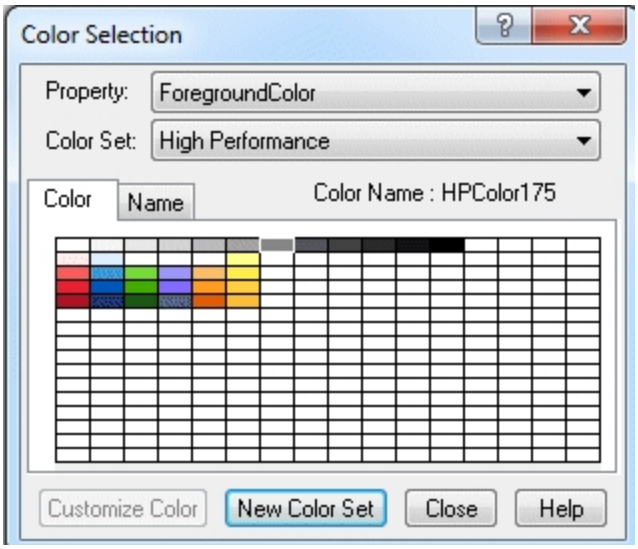
The following table lists the names of the Web_HMI Toolbox buttons. The layout of the cells in this table mimics the layout of the corresponding buttons in the Web_HMI Toolbox. A description of each button can be found in the Creating Pictures ebook.

Pointer Selection	Cut	Copy	Paste	Rectangle	Rounded Rectangle	Oval	Chord	Polygon	Pie
Arc	Line	Polyline	Line Connector	Right Line Connector	Text	Datalink Stamper	Bitmap	Set Color	Toggle Grid
Space Evenly Vertical	Space Evenly Horizontal	Align Top	Align Left	Align Bottom	Align Right	Align Horizontal Center	Align Vertical Center	Group	Ungroup
Bring to Front	Send to Back	Set Layer	Display Layer	Fill Expert	Rotate Expert	Foreground Color Expert	Visibility Expert	Undo	--

Using the High-Performance Color Box

The high-performance Color Box contains the colors you need to assign high performance HMI colors to

your objects. It offers color consistency in your pictures, and can be accessed from anywhere in the iFIX WorkSpace. An example of the high-performance Color Box follows.



The Color Box contains the following two drop-down lists to help you apply color to your pictures:

NOTE: The use of gradient color is discouraged when designing pictures for Proficy Operations Hub.

- Property - Lets you select foreground, background, edge, or fade colors if applicable for a selected object. This dialog box is accessed by right-clicking the object, pointing to Color, and then choosing Fade, Foreground, Background, or Edge from the drop-down menu that appears. The default color is gray.
- Color Set - Lets you select a color set from the drop-down list for the selected object(s). The Color Set dialog box is accessed by clicking the Color button on the Tools (Classic view) or on the Format tab in the Styles group (Ribbon view) or the Toolbox, if enabled. The default color is gray

When launched from the Format Tab in Ribbon view, the dialog 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.

For more information on working with color, refer to the Creating Pictures ebook.

Using High-Performance Dynamos

As explained in the Creating Pictures e-book, a dynamo is a group of objects that make up a custom object that provides consistency when used in multiple pictures across your system. When you install iFIX 5.8 SP2, high performance Dynamo sets are available for you to use as well as traditional Dynamo sets. (High Performance Dynamos do not override traditional Dynamos.)

Dynamo set files have an .fds extension and are located in the following directory by default C:\Program Files (x86)\Proficy\iFIX\PIC.

High-performance dynamo sets include the following files:

- HPArrows.fds

- HPLinearGauges.fds
- HPLinearGaugesHist.fds
- HPMixers.fds
- HPMotors.fds
- HPPipes.fds
- HPPumps.fds
- HPTanks.fds
- HPTankAnim.fds
- HPTanksAdminHist.fds
- HPValves.fds

NOTES:

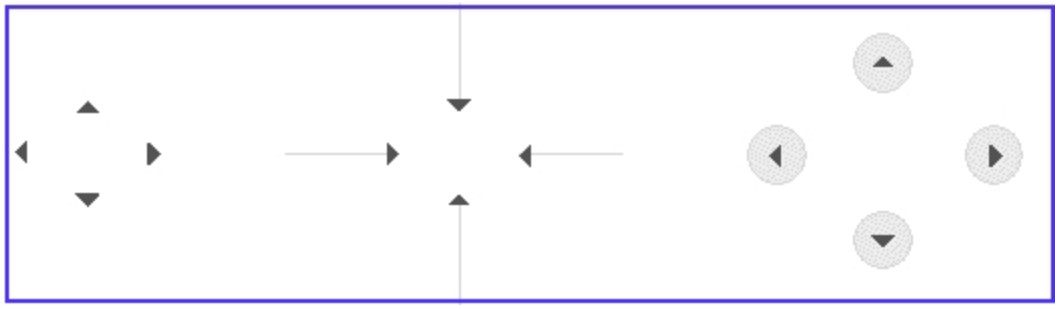
- To optimize dynamo high-performance behavior, it is recommended to enable high-performance graphics in the User Preference - General Tab.
- The following currently apply:
    - HPTanksAnim and HPLinearGauges dynamos do not support Historian. If you plan to use Historian tags, use the HPLinearGaugesHist and HPTanksAnimHist dynamos.
    - HPLinearGaugesHist and HPTanksAnimHist support Historian data sources only.
    - HPMixers, HPPumps, HPValves, HPMotors, HPTankAnim, and HPLinearGauges dynamos support Historian and OPC as data sources. Historian data sources only support the Proficy Historian current value.
    - HPMixers, HPPumps, HPValves, HPMotors, HPTankAnim, and HPLinearGauges Data Sources do not support complex mathematical expressions, Picture object properties, or Global Variables.

You can drag and drop a high-performance Dynamo object from the set into your picture. A Dynamo dialog box appears when you double-click on a Dynamo or when the Dynamo is first copied into a new picture. For more information on using Dynamos, refer to the Creating Pictures e-book.

High-Performance Arrow Dynamos (HPArrows.fds)

Dynamo Set

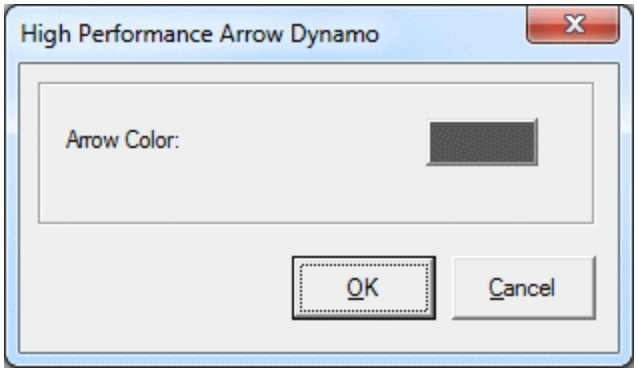
The high-performance Arrow Dynamo set includes the following dynamos.



Dialog Box

A high-performance Arrow Dynamo dialog box contains the following property:

- Arrow Color - You can accept the default Arrow color or select a new color from the high performance Color Box. The following illustration shows the default Arrow color.



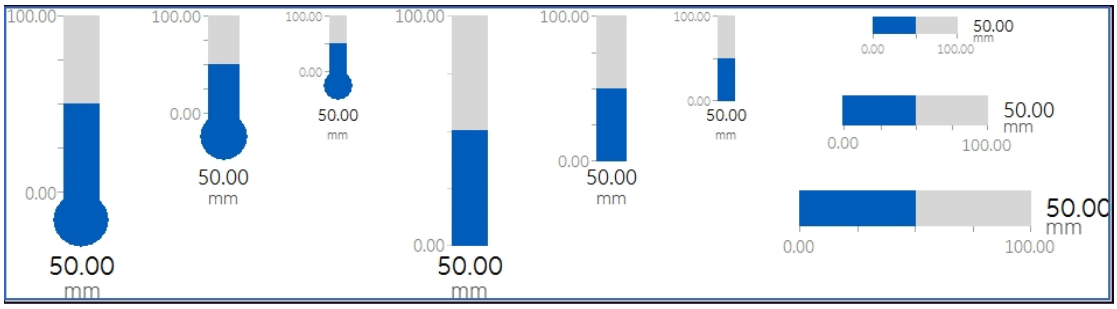
High-Performance Linear Gauges Dynamos (HPLinearGauges.fds)

Dynamo Set

The high-performance Linear Gauges dynamo set is designed for real time data and includes the following horizontal and vertical dynamos.

NOTES:

- This Dynamo Set is currently designed for iFIX real time data, OPC data items, and tag groups with iFIX tags or OPC data items.
- A datalink within this dynamo will show the current value in run mode, which may not scale with the Lowest and Highest Input values.
- Currently, this Dynamo does not support complex mathematical expressions, Picture object properties, or Global Variables



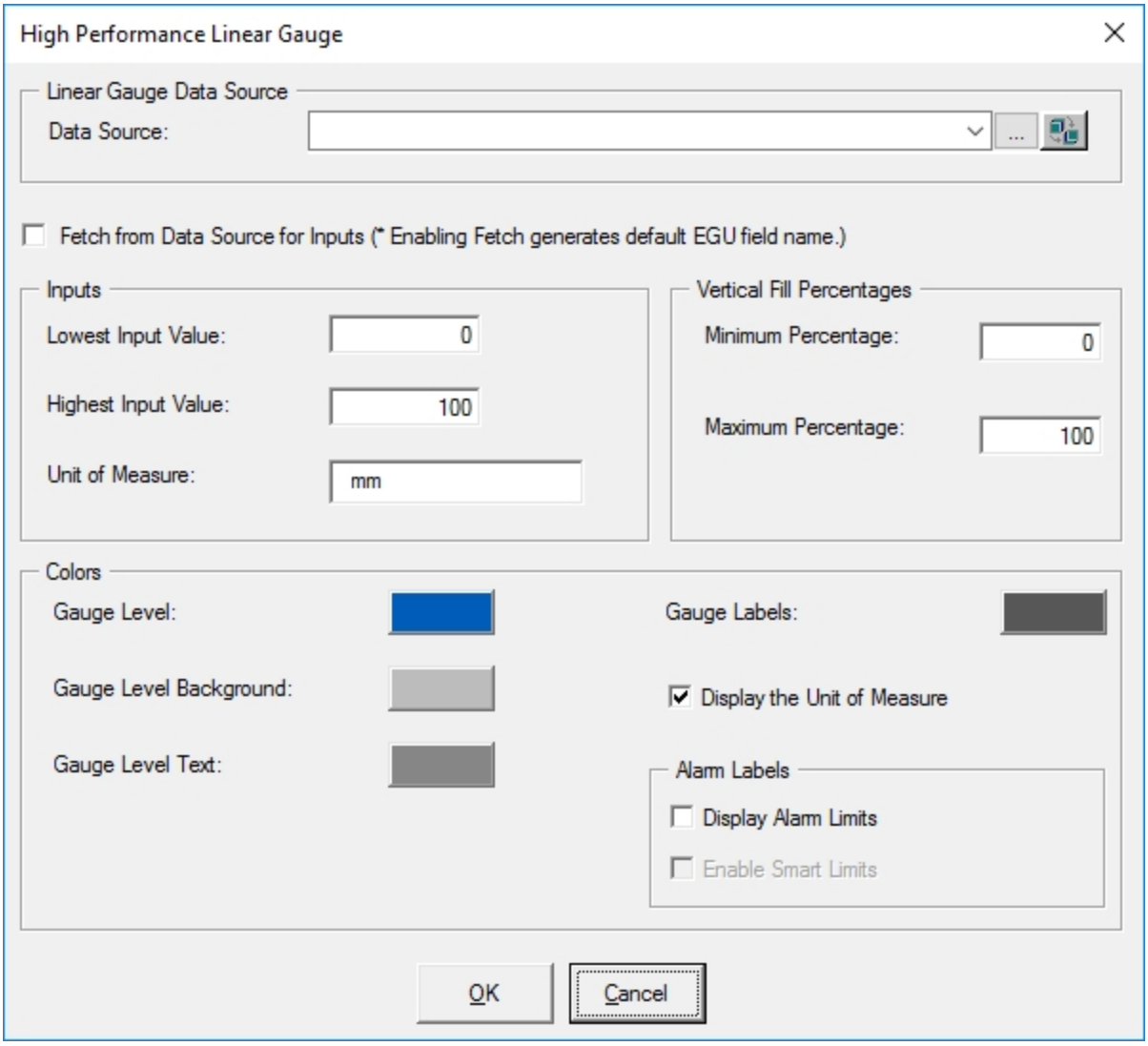
Dialog Box

The high-performance Linear Gauge Dynamo dialog box contains the following properties:

- Linear Gauge Data Source - Allows you to enter the data source that animates the Linear Gauge Dynamo. Click the browse button (...) to browse data sources in the Expression Builder. Click

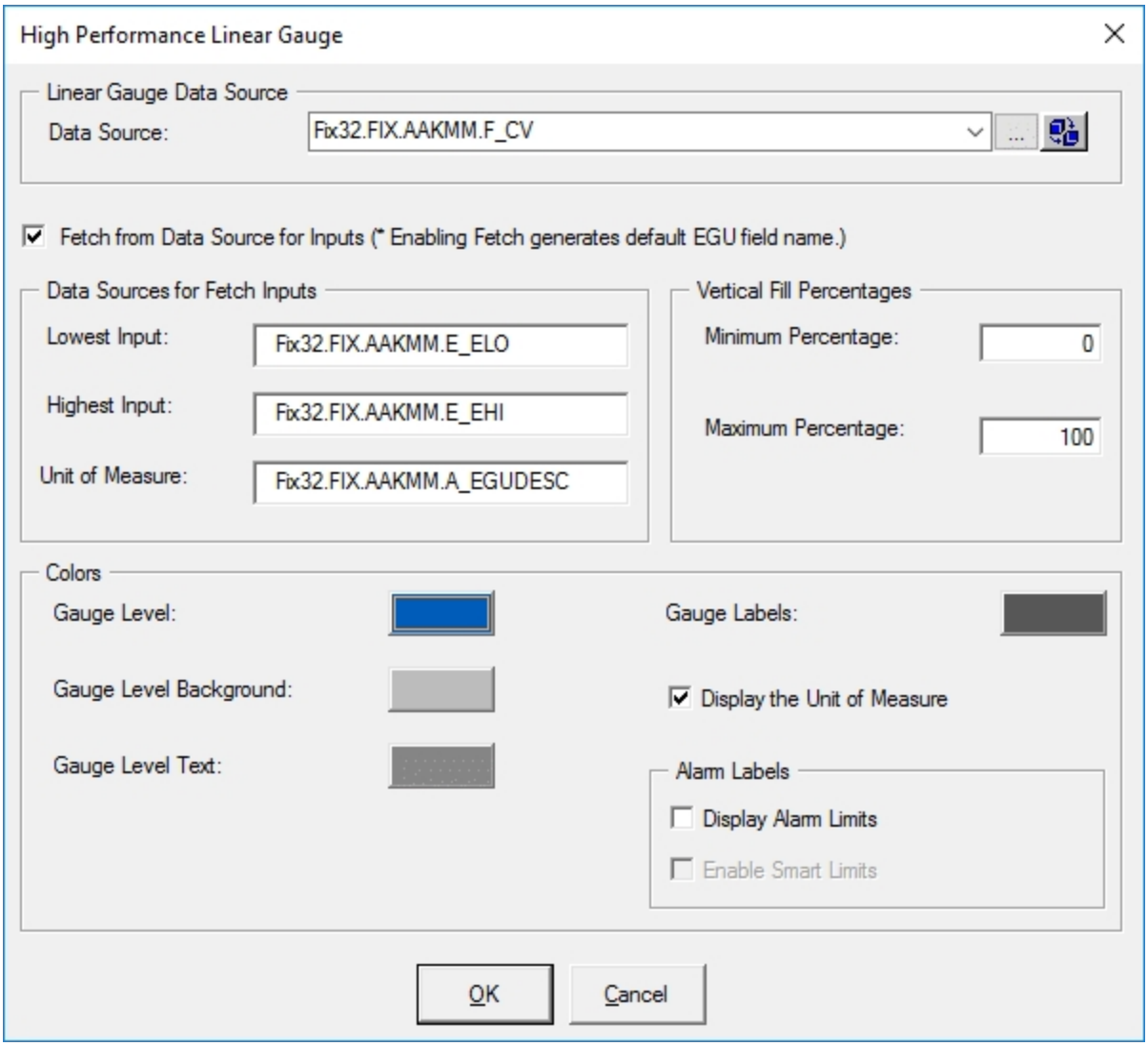
the down button to view the last data sources you used. These dynamos are designed to support real time data only.

- Fetch from Data Source for Inputs
    - When this box is not checked, it provides Input dialog boxes to specify the Lowest and Highest input values and the Unit of Measure.



    - When this box is checked, it provides dialog boxes for the data sources for Fetch Inputs and generates the default data sources with default EGU fields based on the main data source you specified. Default data sources for the Lowest Input, Highest Input, and Unit of Measure can be modified if needed. When you enable this checkbox and specify:
        - A data source, then default fields for the data source are used for fetch. If necessary, you can edit the data sources for fetch inputs.

For example, the following screen shows the default data sources with default fields for the Lowest Input, Highest Input, and Unit of Measure generated from the main data source, Fix32.FIX.AAKMM.F_CV. The Lowest and Highest Input values and the Unit of Measure will be read from those data sources in run mode.

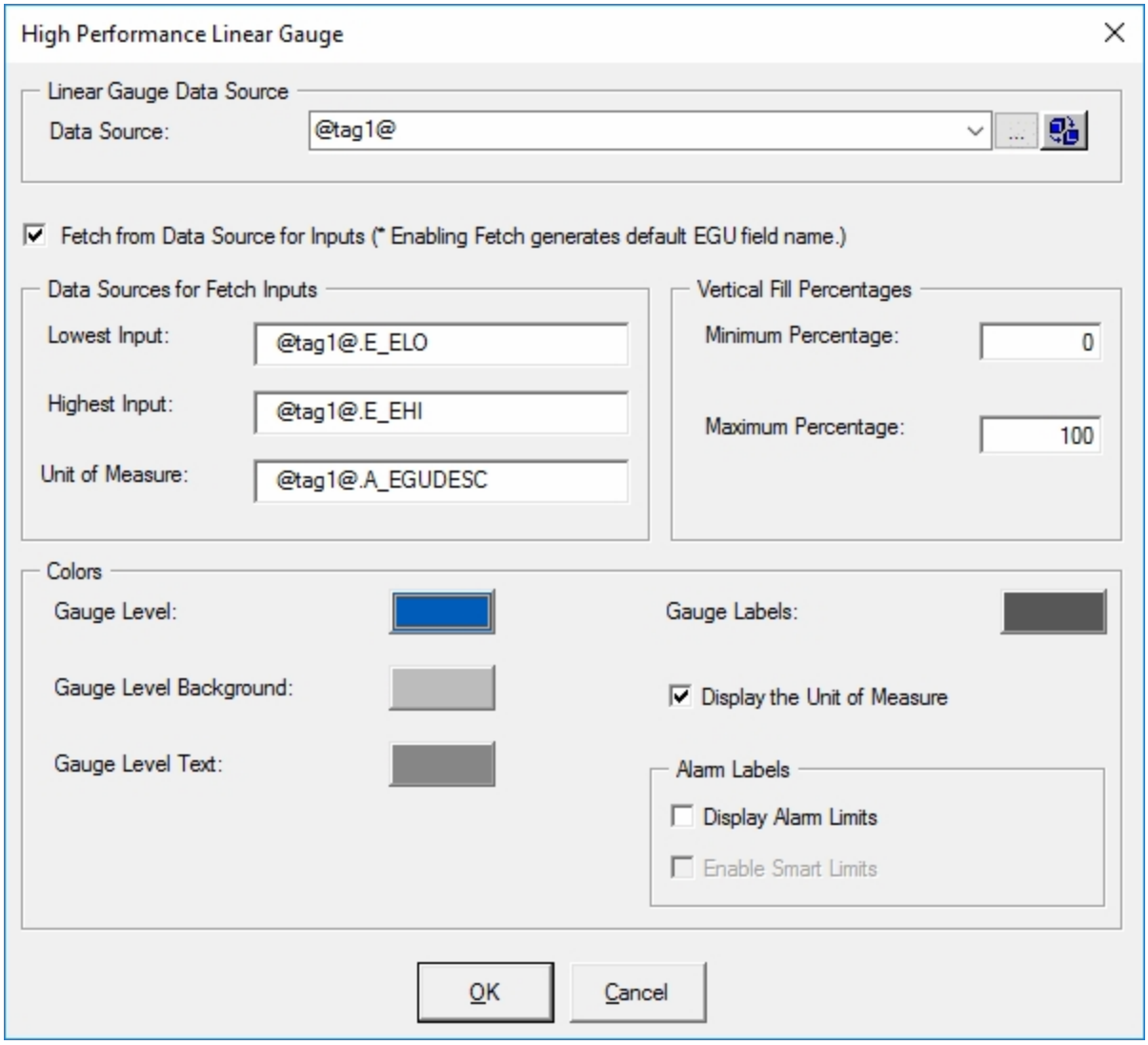


NOTES:

- If you are using iFIX tag item (A_CV or F_CV syntax) through iFIX's OPC server, then the default lowest and highest input datasources and UoM data source are automatically generated as same as straight iFIX tag syntax.
- If you are using a third party OPC driver, then iFIX does not know the EGU data source items for the lowest and highest since it is vendor dependent; therefore, you must specify items for the datasources for Fetch Inputs

  The Default is the same for the main datasource and you can modify it.

- A tag group as a data source, then the tag group substitution is expected to be defined with no fields. The Lowest and Highest Input values and the Unit of Measure are read from the default fields of the tag group symbol. For example, if you define the tag group symbol as tag1, and the substitution is Fix32.FIX.AI0, then you must specify @tag1@ or @tag1@.F_CV in the data source. Refer to the Tag Group Substitution for more information on permissible tag group substitutions.



NOTE: Data sources for Fetch Inputs do not support complex mathematical expressions, Picture object properties, or Global Variables.

- Vertical or Horizontal Fill Percentages - Provides a dialog box for the minimum and maximum percentages to use for the GaugeLevel animation in the dynamo.
- Colors - Allows you to accept the default gauge level and label colors or select a new color from the high performance Color Box. The previous illustration shows the default Gauge Level and Gauge Label colors.
- A check box allows you to select (or deselect) to display the Unit of Measure in the dynamo.

- Alarm Limits - Allows you to display labels for the defined alarm limits in run mode. The optional Enable Smart Limits feature allows you show only the alarm limits that you are approaching on the gauge. Smart Limits help if you have multiple of these Dynamos on screen. In this case, the Alarm Limits labels can crowd the picture and could possibly cause confusion. Smart labels provide the situational awareness with less clutter.

Tag Group Substitution

You can use the following table to guide you with using Tag Group substitutions.

Tag Group Symbol	Tag Group Substitution	Data Source in Dynamo	Result
Sample1	Fix32.FIX.AI0	• @Sample1@.F_CV • @Sample1@	OK
Sample2	FIX.AI0	• @Sample2@.F_CV • @Sample2@	OK
Sample3	AI0	• @Sample3@.F_CV • @Sample3@	It works in general, but is not supported for this dynamo. A Warning message will appear in run mode.
Sample4	Fix32.FIX.AI0.F_CV	• @Sample4@	It works in general, but is not supported for this dynamo. A Warning message will appear in run mode.

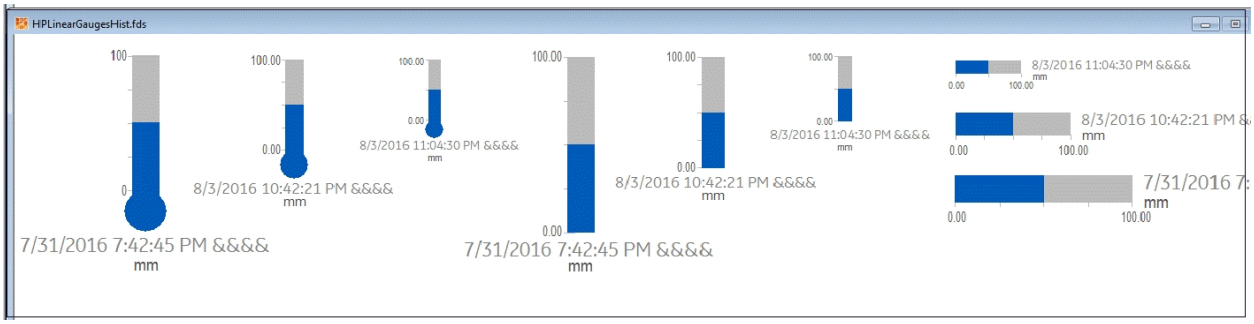
High-Performance Linear Gauge for Historian (HPLinearGaugesHist.fds)

Dynamo Set

The high-performance Linear Gauges for Historian dynamo set is designed to support Historian data sources only. It includes the following horizontal and vertical dynamos.

NOTES:

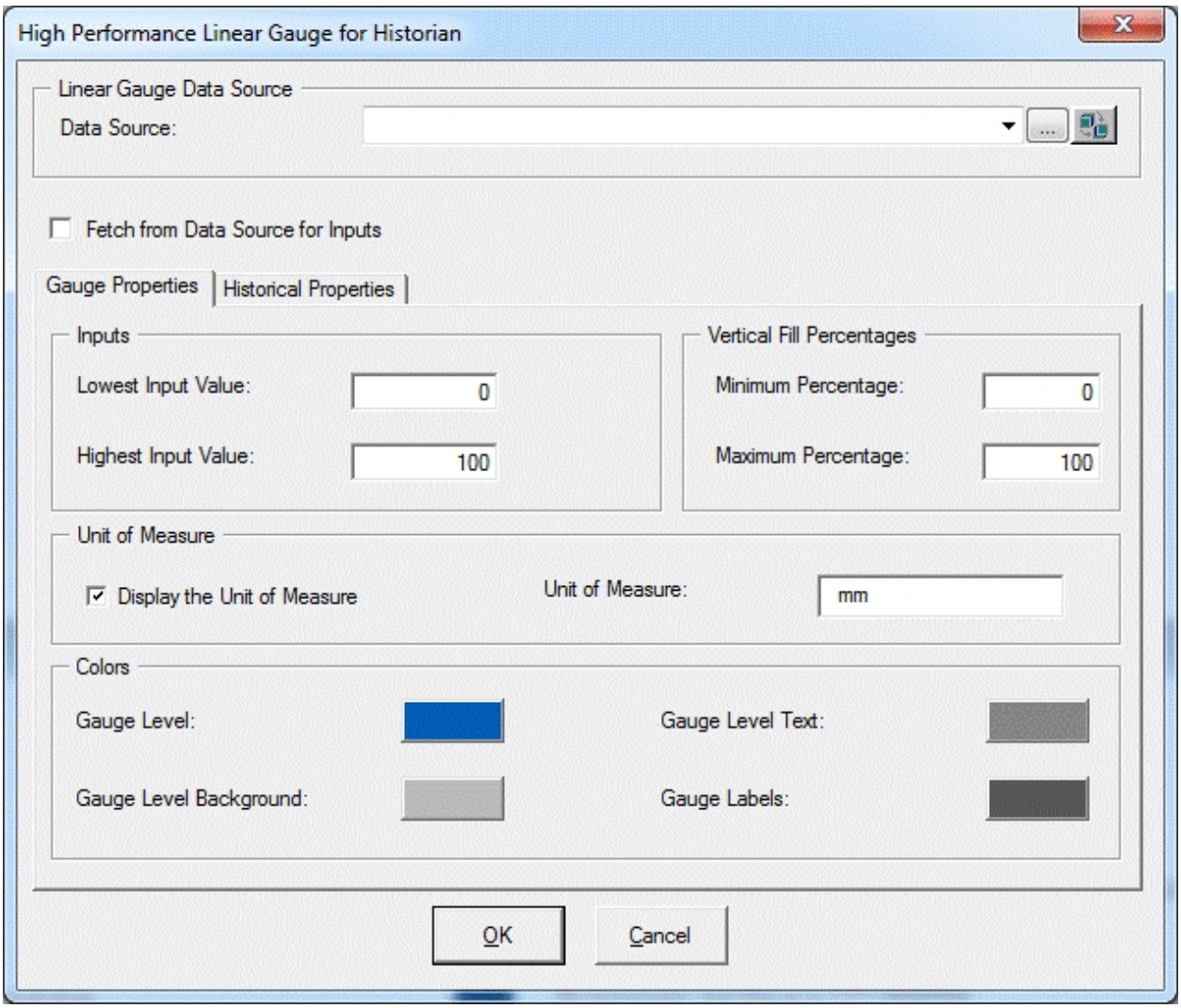
- This dynamo set is designed for Historian data sources, or tag groups with Historian tags.
- A Historical Data Link within this dynamo shows the current value or specified historical data in run mode, which may not scale with the Lowest and Highest Input values.
- Currently, the dynamos do not support complex mathematical expressions, Picture object properties, or Global Variables.



Dialog Box

The High-Performance Linear Gauge for Historian dynamo dialog box contains the following properties:

- **Linear Gauge Data Source** - Allows you to specify the data source that animates the Linear Gauge Dynamo. Click the browse button (...) to browse data sources in the Expression Builder. Click the down button to view the last data sources you used. These dynamos are designed to support Proficy Historian data sources only.
- **Fetch from Data Source for Inputs** - When enabled, lets you specify the data source for the inputs.
    - When this box is not checked, the Lowest and Highest Input Value fields are accessible in the Inputs section of the dialog box. These fields can be modified by the user.



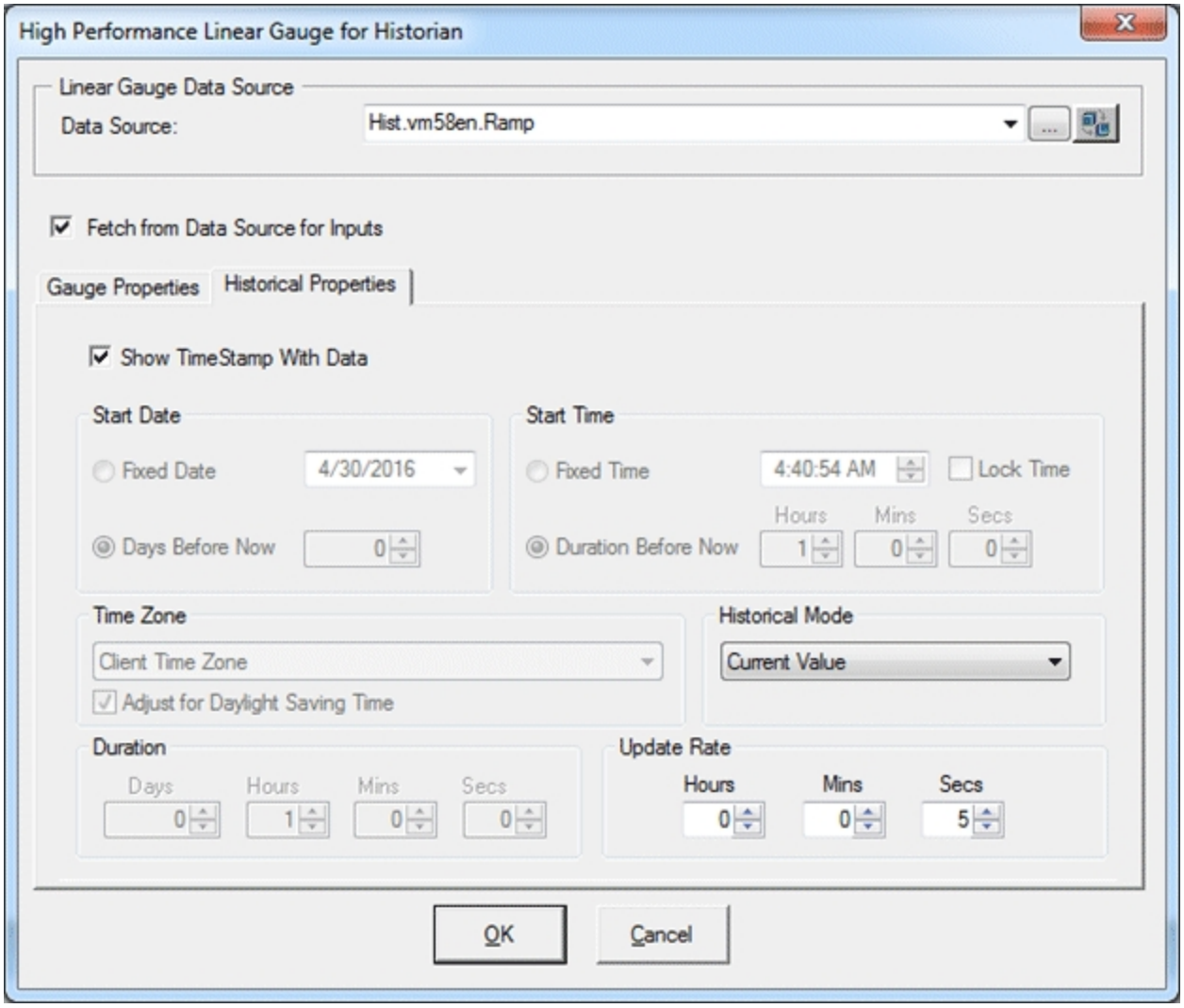
    - When this box is checked, the fields contain dialog boxes with the data sources for the Fetched Inputs value in the Gauge Properties tab. The Lowest Input Value and the Highest Input Value fields show default data sources for the animation object's LoInValue and HiInValue properties.

- **Gauge Properties Tab** - Opens dialog boxes for Inputs or the data sources for Fetched Inputs based on Fetch from Data Source for Inputs status and other settings for animation, Unit of Measure, and Colors.

Gauge Property	Description
Inputs	Allow you to enter the lowest and highest input values to use.
Fetch from Data Source for Inputs	Allows you to specify data sources for Lowest and Highest Inputs. The default data sources are the animation object's LoInValue and HiInValue properties. iFIX reads the EGU (Lo and Hi value) from Historian and then sets them to those properties in run mode. In most cases, you do not need to change them. However, you can use iFIX tags for a workaround if needed.
Fill Percentages	Provides a dialog box for the minimum and maximum percentages to use for the GaugeLevel animation in the dynamo.
Units of Measure	Allows you to select (or de-select) to display the Unit of Measure in the dynamo and specify strings for the Unit of Measure.
Colors	Allows you to accept the default gauge level and label colors or select new colors from the high performance Color Box. The previous illustration shows the default Gauge Level and Gauge Label colors.

NOTE: Data sources for Fetch Inputs do not support complex mathematical expressions, Picture object properties (other than default animation object's LoInValue and HiInValue), or Global Variables.

- **Historian Properties Tab** - Opens dialog boxes to select properties to use with Historian tags.



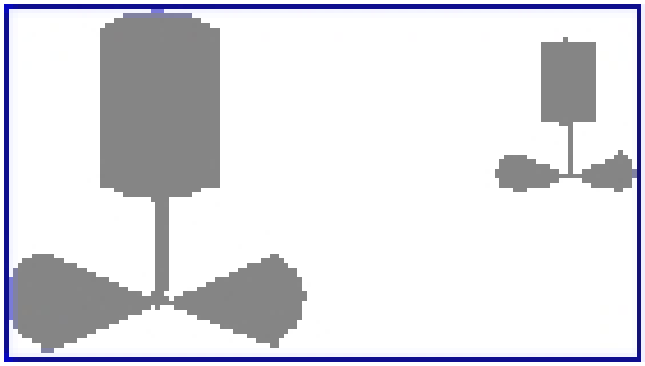
Property	Description
Show Time Stamp with Data	When the check box is selected, a timestamp is shown with the data. Default = Checked.
Start Date	Lets you enter the date to start the data collection. • Fixed Date - Lets you specify a specific date to start gathering data. • Days Before Now - Lets you specify the number of days before today to start gathering data. Default: Disabled since the Historical Mode is the Current Value.
Start Time	Lets you enter the time to begin to collect data. • Fixed Time - Lets you enter a specific time to

	start gathering data. • Lock - Locks the current time, even if you change the timezone in the Date and Time Properties dialog box in the Control Panel. This field is only available when you designate a specific time to start the display using the Fixed Time field. • Duration Before Now - Allows you to specify the hours, minutes, and seconds before now (current date/time) to start the data collection. Default: Disabled since the Historical Mode is the Current Value.
Time Zone	Allows you to select the time zone for the data. You can also use the check box to adjust the time to Daylight Savings Time. Default: Disabled since the Historical Mode is the Current Value.
Historical Mode	Provides a drop-down menu to select the Historian data mode you want to use. Default: Current Value
Duration	Specifies the duration time in days, hours, minutes, and seconds. Default: Disabled since the Historical Mode is the Current Value.
Update Rate	Specifies the update (refresh) rate in hours, minutes, and seconds.

High-Performance Mixer Dynamos (HPMixer.fds)

Dynamo Set

The high-performance Mixer Dynamo set includes the following dynamos.



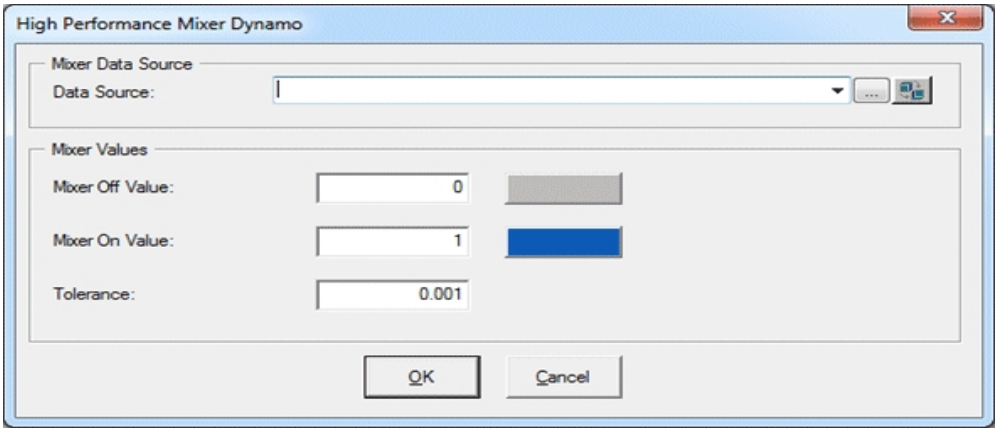
Dialog Box

The high-performance Mixer Dynamo dialog box contains the following properties:

- Mixer Data Source - Allows you to enter the data source that animates the Mixer Dynamo. Click the browse button (...) to browse data sources in the Expression Builder. Click the down button to view the last data sources you used. These dynamos are designed to support iFIX real time data, OPC, and Proficy Historian. Proficy Historian data source is supported for the current value.

  NOTE: Currently, this dynamo does not support complex mathematical expressions, Picture object properties, or Global Variables.

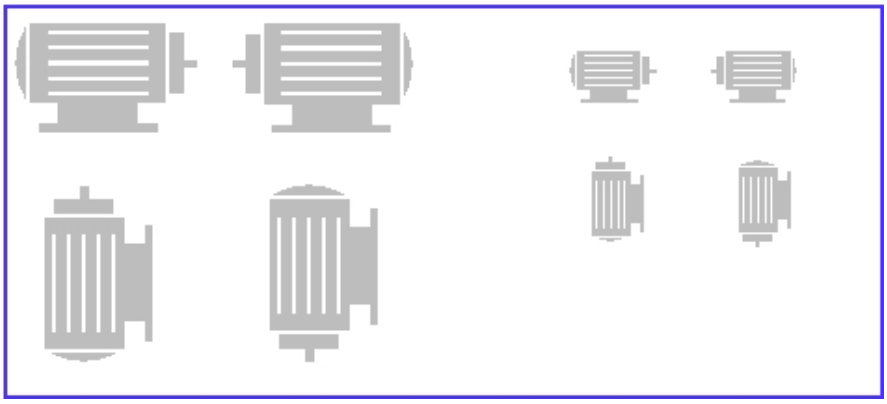
- Mixer Values - Allow you to specify the following:
  - Mixer Off and Mixer On values - Specifies the values to turn the mixer on and off. You can accept the default colors for these values or select new colors from the high performance Color Box. The following illustration shows the default Mixer Off and On Value colors.
  - Tolerance - Specifies the rounding factor to be used for the Mixer Off and Mixer On values. 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 within the range 0.9 to 1.1 to equal the target value.



High-Performance Motors Dynamos (HPMotors.fds)

Dynamo Set

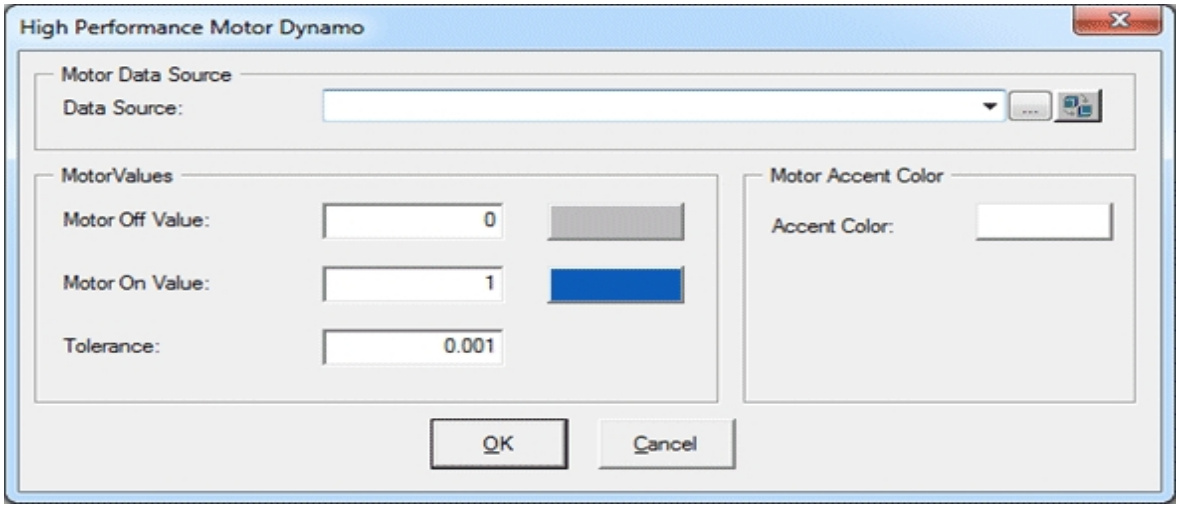
The high-performance Motors Dynamo set includes the following dynamos.



Dialog Box

The high-performance Motor Dynamo dialog box contains the following properties:

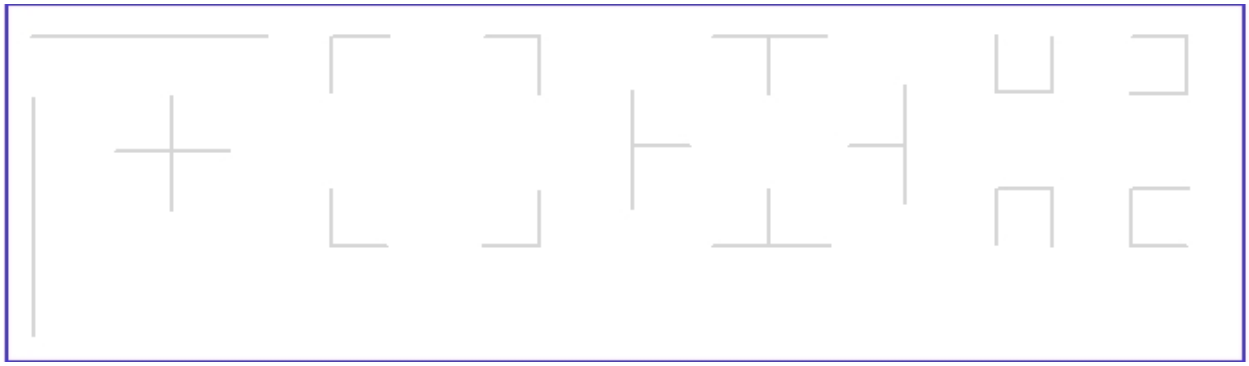
- Motor Data Source - Allows you to enter the data source that animates the Motor Dynamo. Click the browse button (...) to browse data sources in the Expression Builder. Click the down button to view the last data sources you used. These dynamos are designed to support iFIX real time data, OPC, and Proficy Historian. Proficy Historian data source is supported for the current value. **NOTE**: Currently, this dynamo does not support complex mathematical expressions, Picture object properties, or Global Variables.
- Motor Values - Allows you to specify the following:
    - Motor Off and Motor On values - Specifies the values to turn the motor on and off. You can accept the default colors for these values or select new colors from the high performance Color Box. The following illustration shows the default Motor Off and On Value color (and Accent color).
    - Tolerance - Specifies the rounding factor to be used for the Motor Off and Motor On values. 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. 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 within the range 0.9 to 1.1 to equal the target value.
- Motor Accent Color - Lets you accept the default color or select a new color from the high performance Color Box.



High-Performance Pipes Dynamo (HPPipes.fds)

Dynamo Set

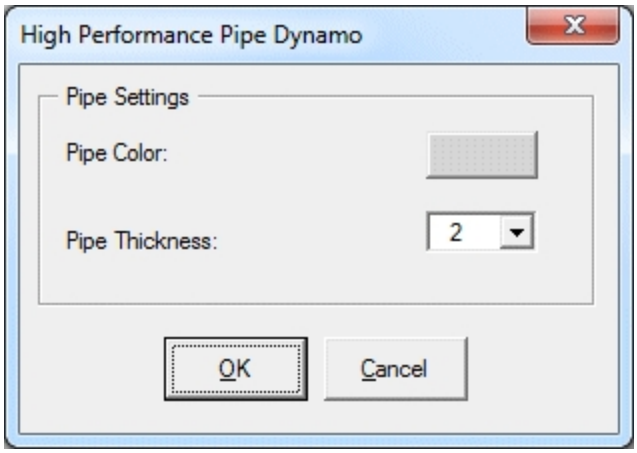
The high-performance Pipes dynamo set includes the following dynamos.



Dialog Box

The high-performance Pipes dialog box contains the following properties:

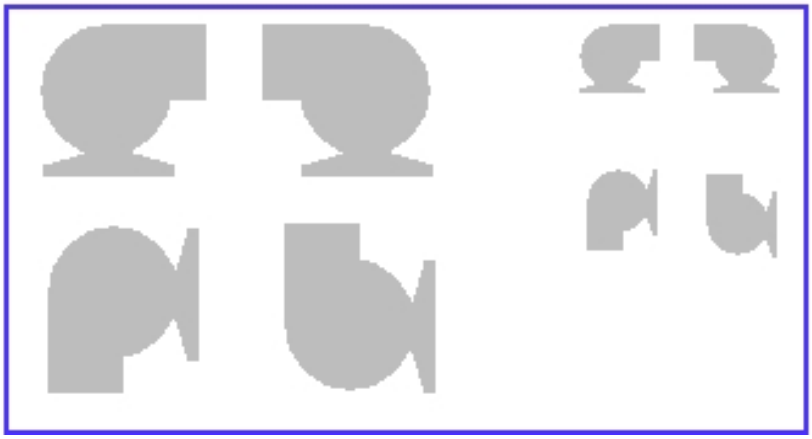
- Pipe Settings - Lets you accept the default color or select a new color from the high performance Color Box. You can also change the Pipe Thickness if you wish. The following illustration shows the default Pipe Color.



High-Performance Pump Dynamos (HPPump.fds)

Dynamo Set

The high-performance Pump dynamo set includes the following dynamos.



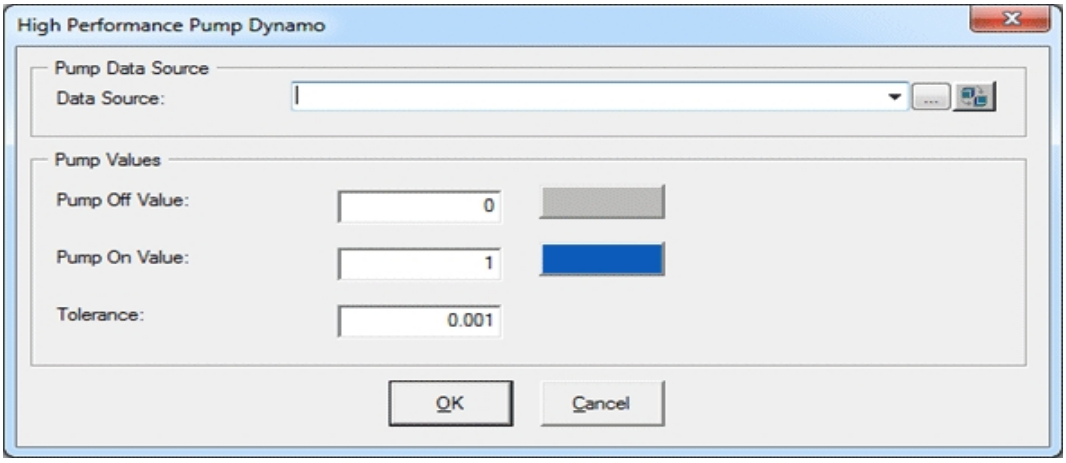
Dialog Box

The high-performance Pump Dynamo dialog box contains the following properties:

- Pump Data Source - Allows you to enter the data source that animates the Pump Dynamo. Click the browse button (...) to browse data sources in Expression Builder. Click the down button to view the last data sources you used. These Dynamos are designed to support iFIX real time data, OPC, and Proficy Historian. Proficy Historian data source is supported for the current value.
  NOTE: Currently, this dynamo does not support complex mathematical expressions, Picture object properties, or Global Variables.
- Pump Values - Allow you to enter the following:
  - Pump Off and Pump On values - Specifies the values to turn the pump on and off. You can accept the default colors for these values or select new colors from the high performance

Color Box. The following illustration shows the default Pump Off and On Value color (and Accent color).

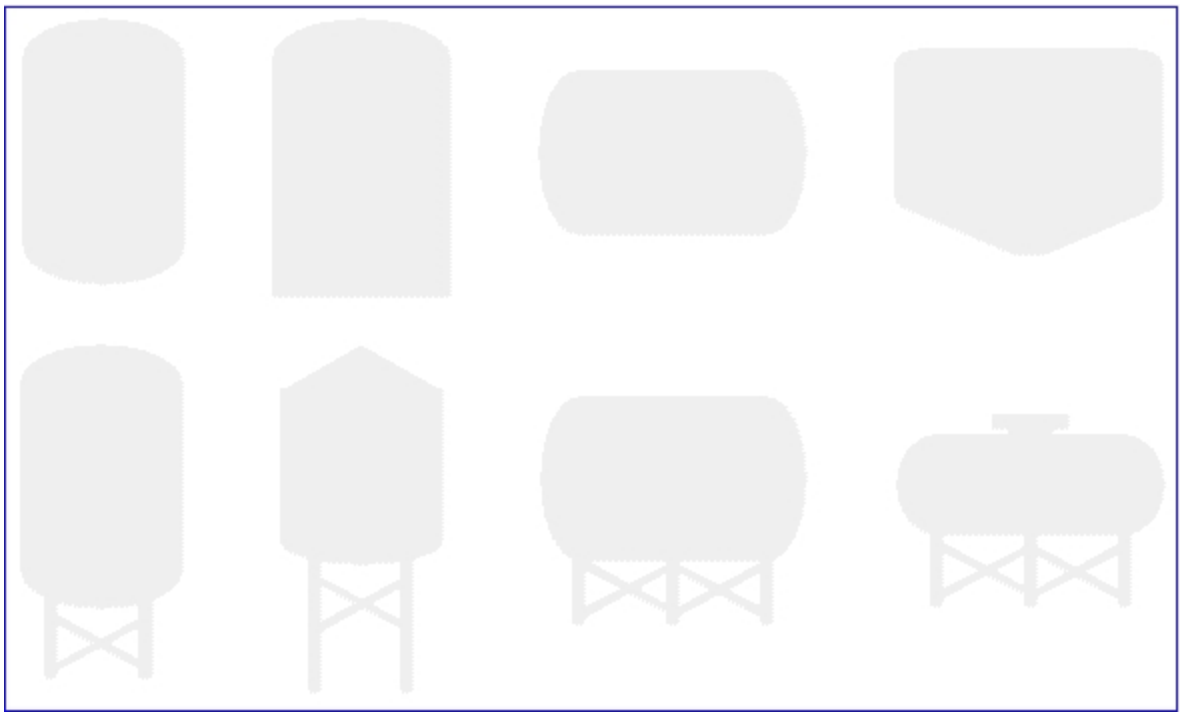
- Tolerance - Specifies the rounding factor to be used for the Pump Off and Pump On values. Typically, iFIX uses this value when comparing a process value to a target value. If the process value is within the specified tolerance, iFIX assumes the two values are equal. For example, if the target value 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 within the range 0.9 to 1.1 to equal the target value.



High-Performance Tank Dynamos (HPTanks.fds)

Dynamo Set

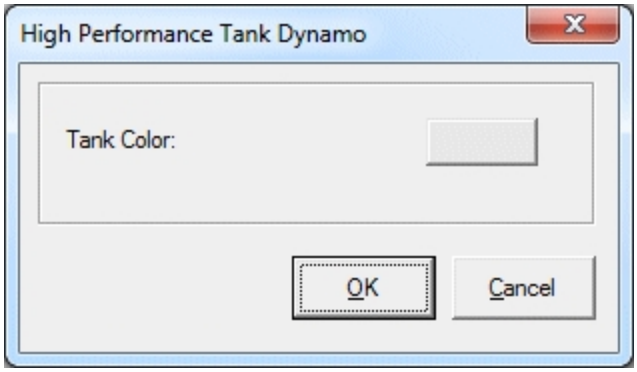
The high-performance Tank dynamo set includes the following dynamos.



Dialog Box

The high-performance Tank Dynamo dialog box contains the following properties:

- Tank Color - Lets you accept the default Tank color or select a new color from the high performance Color Box. The following illustration shows the default Tank color.



High-Performance Tank Animation Dynamos (HPTanksAnim.fds)

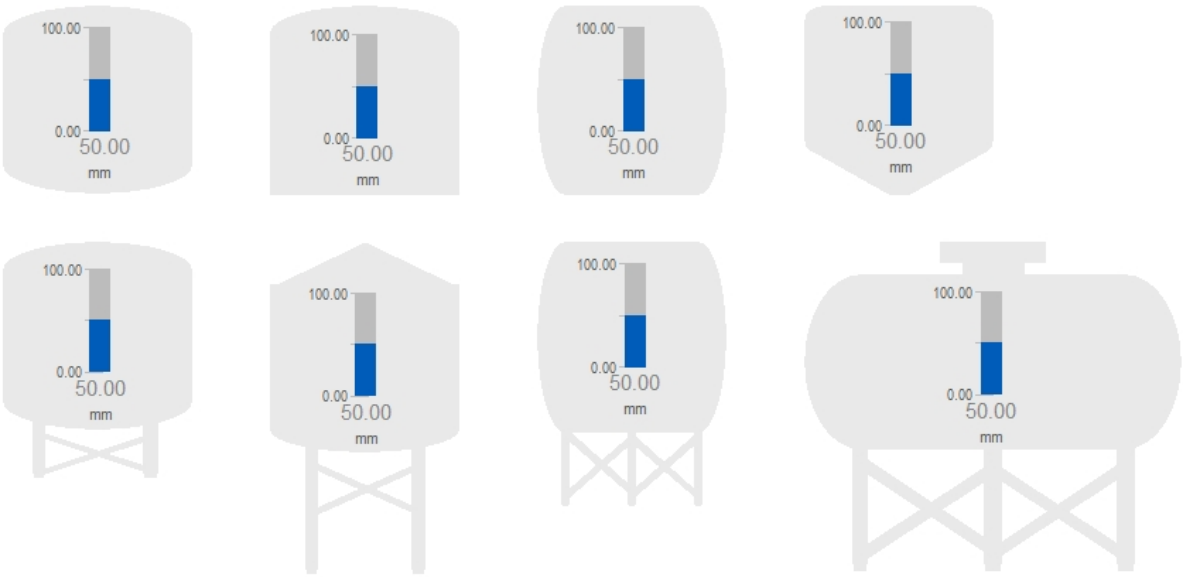
Dynamo Set

The high-performance Tank Animations Dynamo set is designed for real-time datasources only. This dynamo set includes the following dynamos.

NOTES:

- This dynamo set is currently designed for iFIX real time data, OPC data items, and tag groups with iFIX tags or OPC data items.

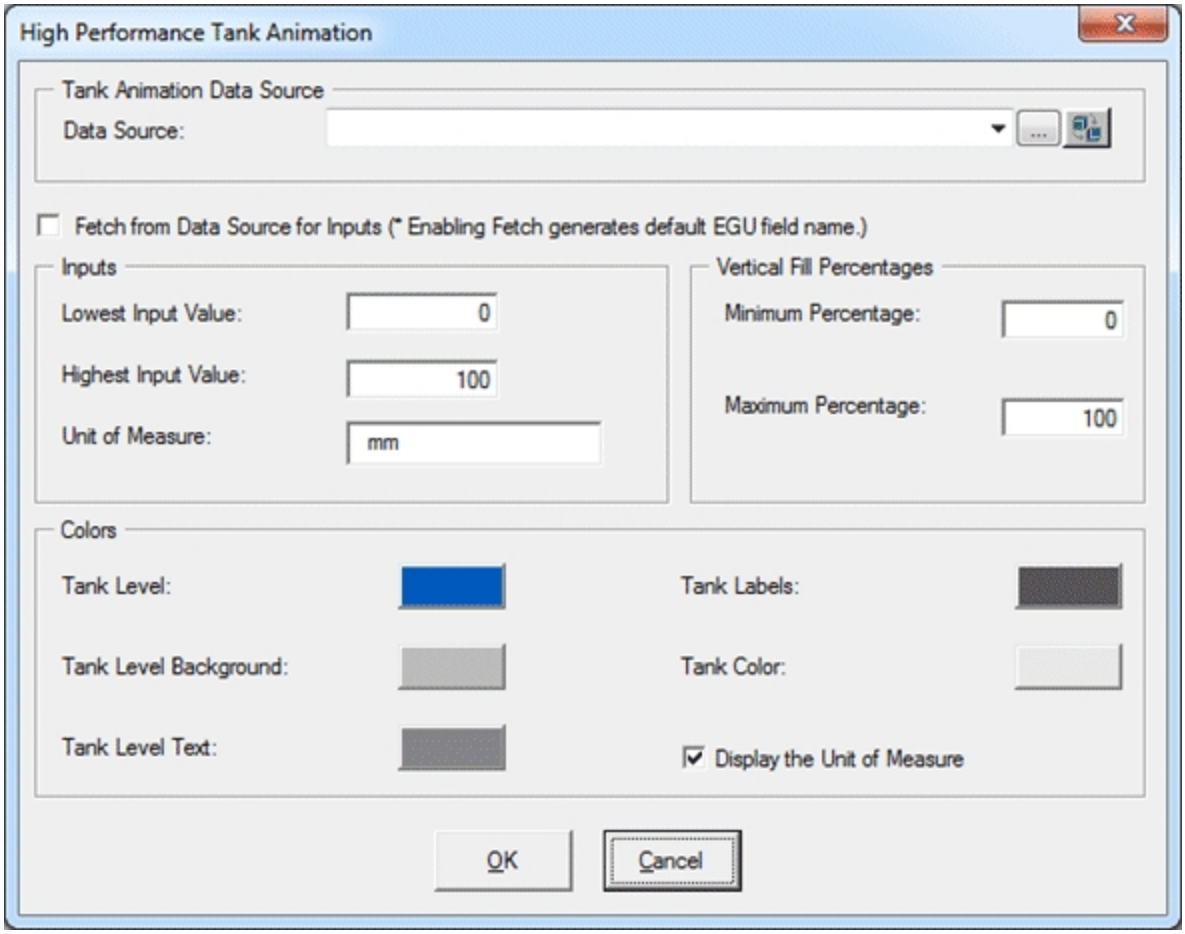
- A datalink within this dynamo will show the current value in run mode, which may not scale with the Lowest and Highest Input values.
- Currently, this dynamo does not support complex mathematical expressions, Picture object properties, or Global Variables.



Dialog Box

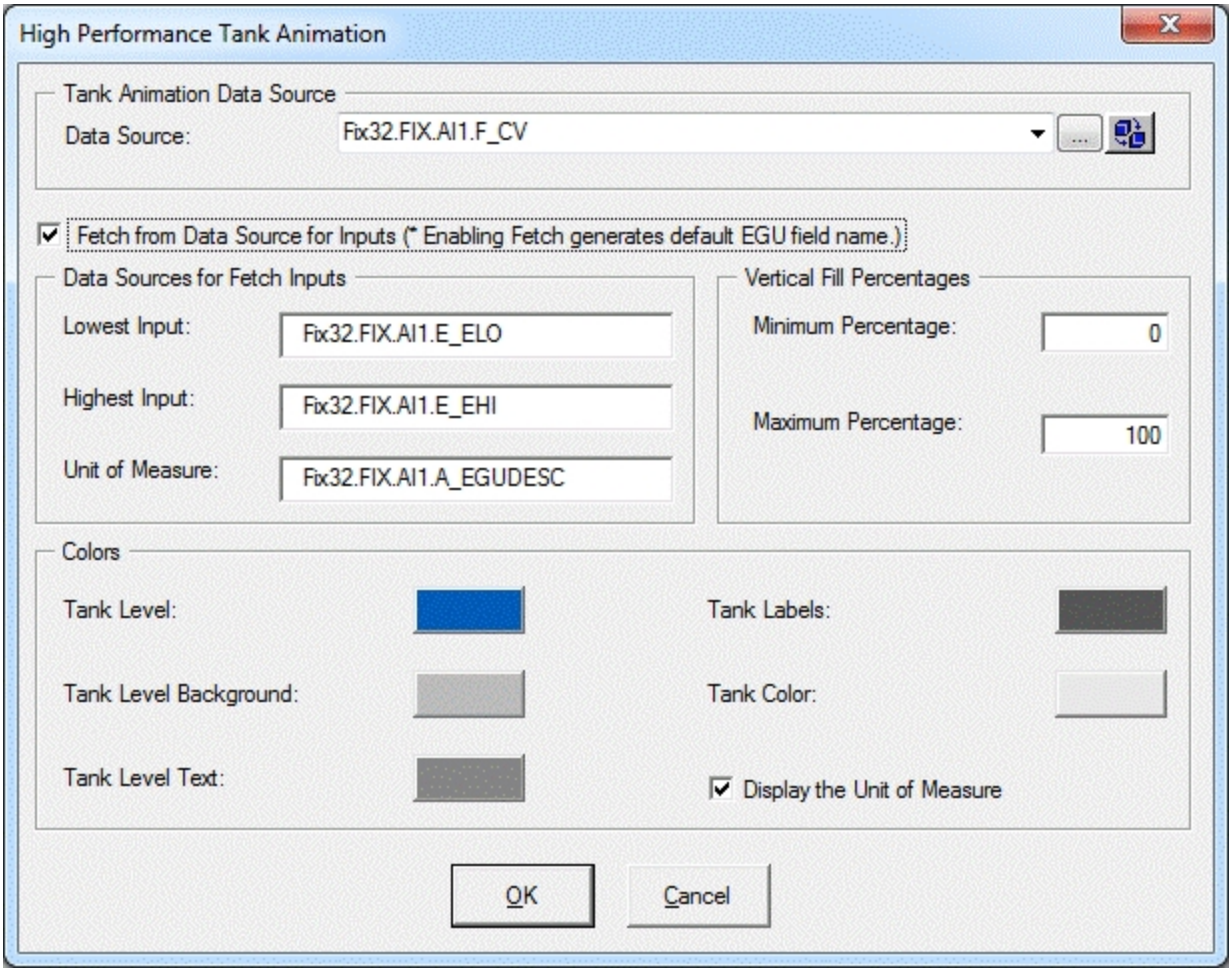
The high-performance Tank Animation Dynamo dialog box contains the following properties:

- Tank Animation Data Source - Allows you to enter the data source that animates the Tank Dynamo. Click the browse button (...) to browse data sources in Expression Builder. Click the down button to view the last data sources you used. These dynamos are designed to support real time data only.
- Fetch from Data Source for Inputs:
    - When this box is not checked, it provides Input dialog boxes to specify the Lowest and Highest inputs and the Unit of Measure.



- When this box is checked, it provides dialog boxes for the Data Sources for Fetch Inputs and generates the default data sources with default EGU fields based on the main data source you specified. Default data sources for the Lowest Input, Highest Input, and Unit of Measure can be modified if needed. When you enable this checkbox and specify:
  - A data source, then default fields for the data source are used for fetch. If necessary, you can edit the data sources for fetch inputs. For example, the following screen shows the default data sources with default fields for the Lowest Input, Highest Input, and Unit of Measure generated from the main data source, Fix32.FIX.AI1.F_CV.

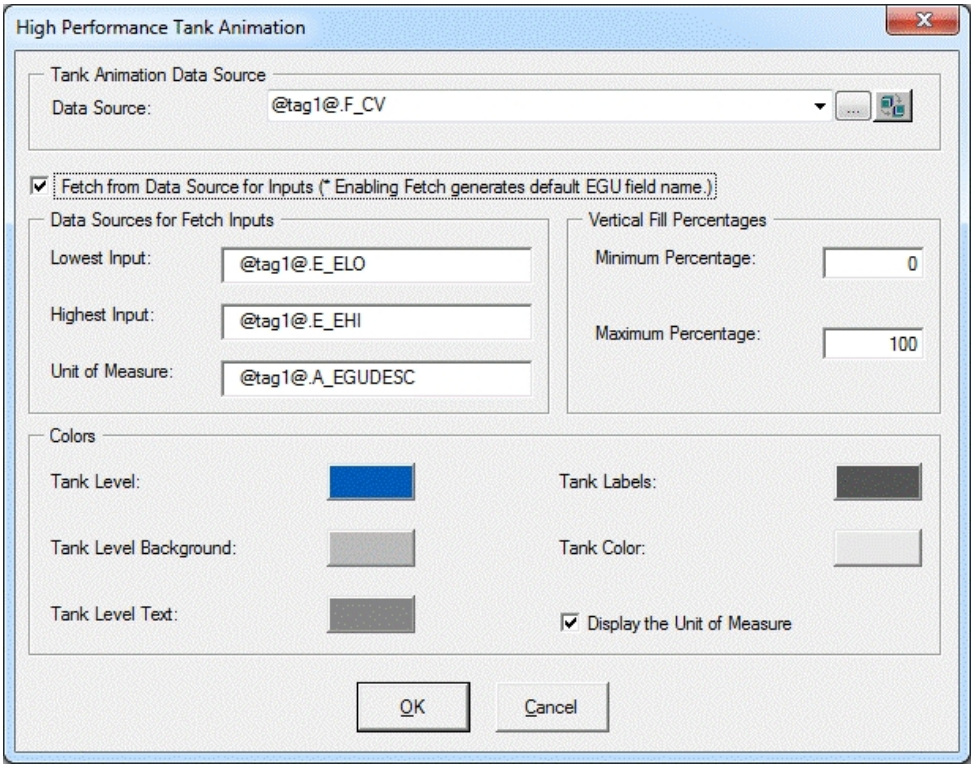
    For example, the following screen shows the default data sources with default fields for the Lowest Input, Highest Input, and Unit of Measure generated from the main data source, Fix32.FIX.AI1.F_CV. The Lowest and Highest Input values and the Unit of Measure will be read from those data sources in run mode.



NOTES:

- If you are using iFIX tag item (A_CV or F_CV syntax) through iFIX's OPC server, then the default lowest and highest input datasources and UoM data source are automatically generated as same as straight iFIX tag syntax.
- If you are using a third party OPC driver, then iFIX does not know the EGU data source items for the lowest and highest since it is vendor dependent; therefore, you must specify items for the datasources for Fetch Inputs.
- The Default is the same for the main datasource as you can modify it.

- A tag group as a data source, then the tag group substitution is expected to be defined with no fields. The Lowest and Highest Input values and the Unit of Measure are read from the default fields of the tag group symbol. For example, if you define the tag group as tag1, and the substitution is Fix32.FIX.AI0, then you must specify @tag1@ or @tag1@.F_CV in the data source. Refer to the Tag Group Substitution section for more information.



NOTE: Data sources for Fetch Inputs do not support complex mathematical expressions, Picture object properties, or Global Variables.

- Vertical Fill Percentages - Provides a dialog box for the minimum and maximum percentages to use for this dynamo.
- Tank Colors - You can accept the default colors or select new colors from the high performance Color Box. The previous illustration shows the default Tank Level and Tank Label colors.
- A check box allows you to select (or deselect) to display the Unit of Measure in the dynamo.

Tag Group Substitutions

You can use the following table to guide you with using Tag Group substitutions.

Tag Group Symbol	Tag Group Sub-stitution	Data Source in Dynamo	Result
Sample1	Fix32.FIX.AI0	• @Sample1@.F_CV • @Sample1@	OK
Sample2	FIX.AI0	• @Sample2@.F_CV • @Sample2@	OK
Sample3	AI0	• @Sample3@.F_CV • @Sample3@	It works in general, but not supported for this dynamo. A Warning message will appear in run mode
Sample4	Fix32.FIX.AI0.F_CV	• @Sample4@	It works in general, but not supported for this dynamo. A Warning

	message will appear in run mode

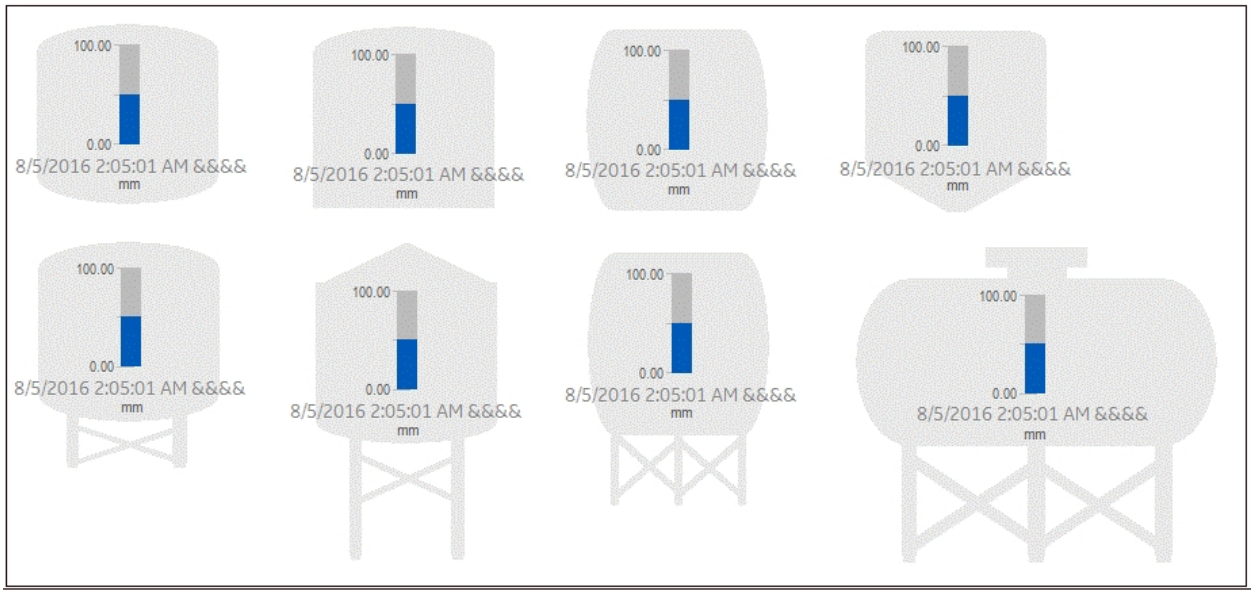
High-Performance Tank Animations for Historian (HPTanksAnimHist.fds)

Dynamo Set

The high-performance Tank Animations for Historian dynamo set is designed for Historian data sources only and includes the following dynamos.

NOTES:

- This dynamo set is designed for Historian data sources, or tag groups with Historian tags.
- A Historical Data Link within this dynamo shows the current value or specified historical data in run mode, which may not scale with the Lowest and Highest Input values.
- Currently, the dynamos do not support complex mathematical expressions, Picture object properties, or Global Variables.

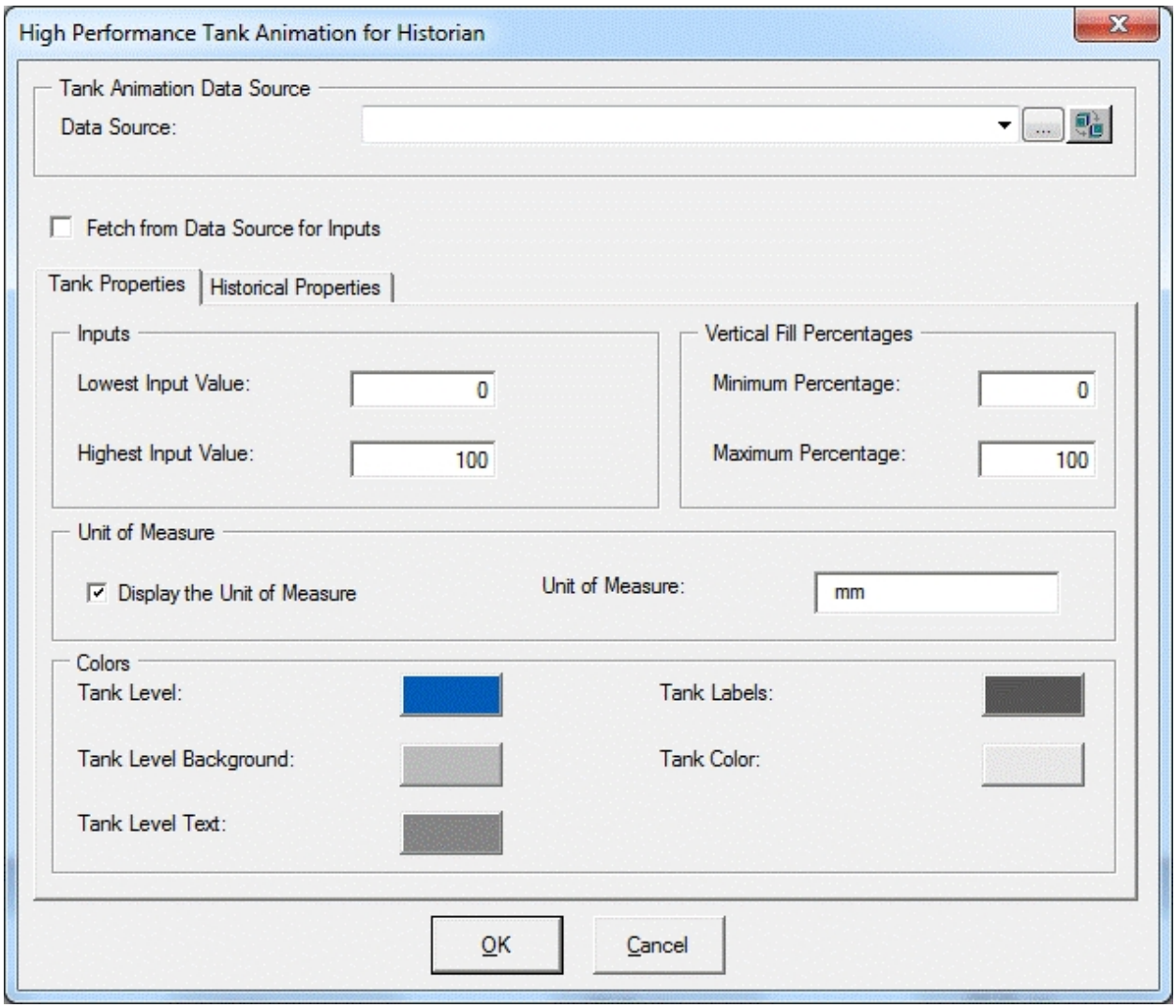


Dialog Box

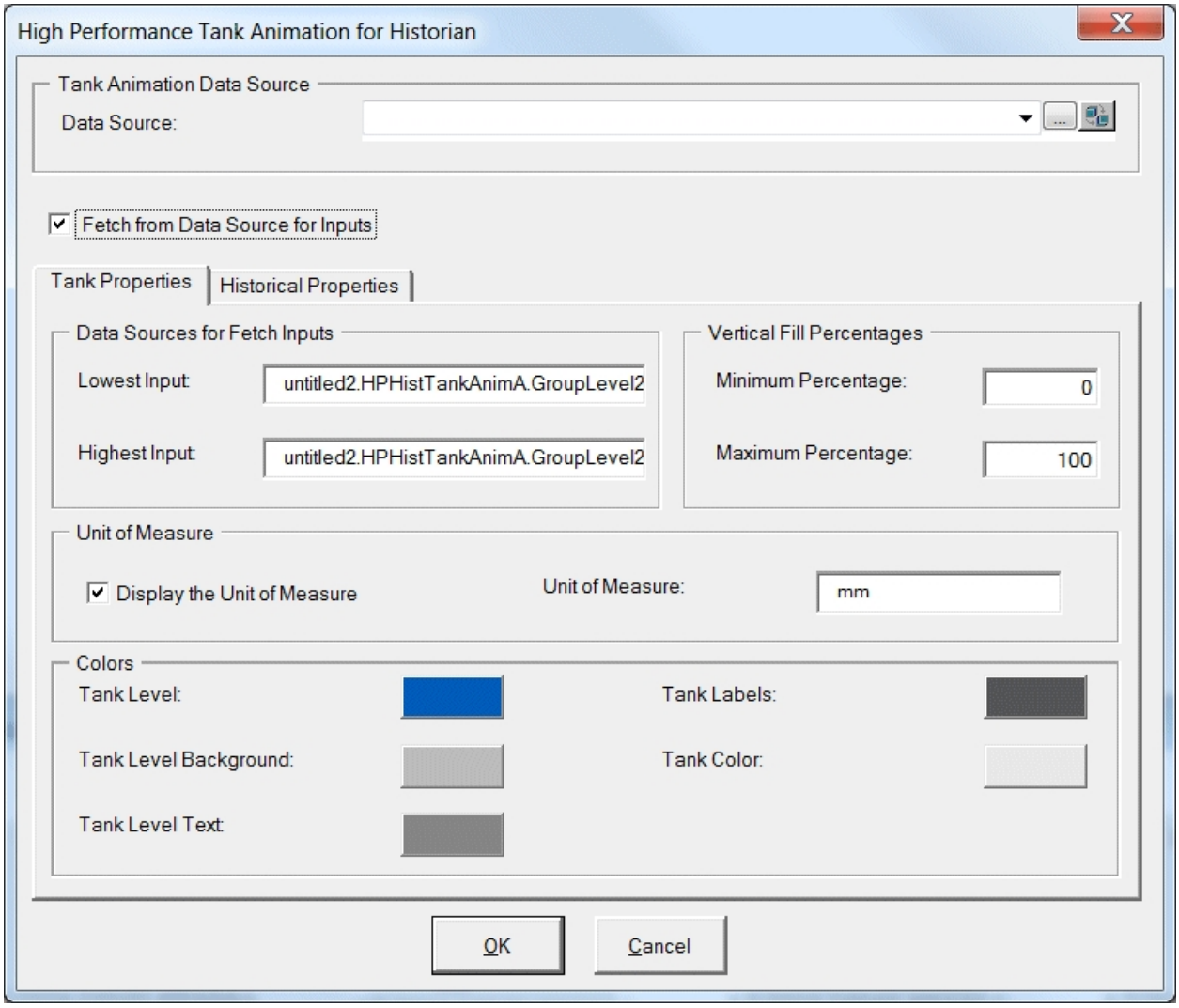
The high-performance Tank Animation for Historian Dynamo dialog box contains the following properties:

- **Tank Animations Data Source** - Allows you to specify the data source that animates the Tank Dynamo. Click the browse button (...) to browse data sources in the Expression Builder. Click the down button to view the last data sources you used. These dynamos are designed to support Proficy Historian data sources only.
- **Fetch from Data Source for Inputs** - When enabled, lets you specify the data source for the inputs.

- When this box is not checked, the Lowest Input Value and the Highest Input Value fields are accessible by the user in the Inputs portion of the dialog box. These fields can be modified by the user.



- When this box is checked, the fields contain dialog boxes with the data sources for the Fetch Inputs values in the Tank Properties tab. The Lowest Input Value and Highest Input Value fields show default data sources of the animation object's LoInValue and HiInValue properties.



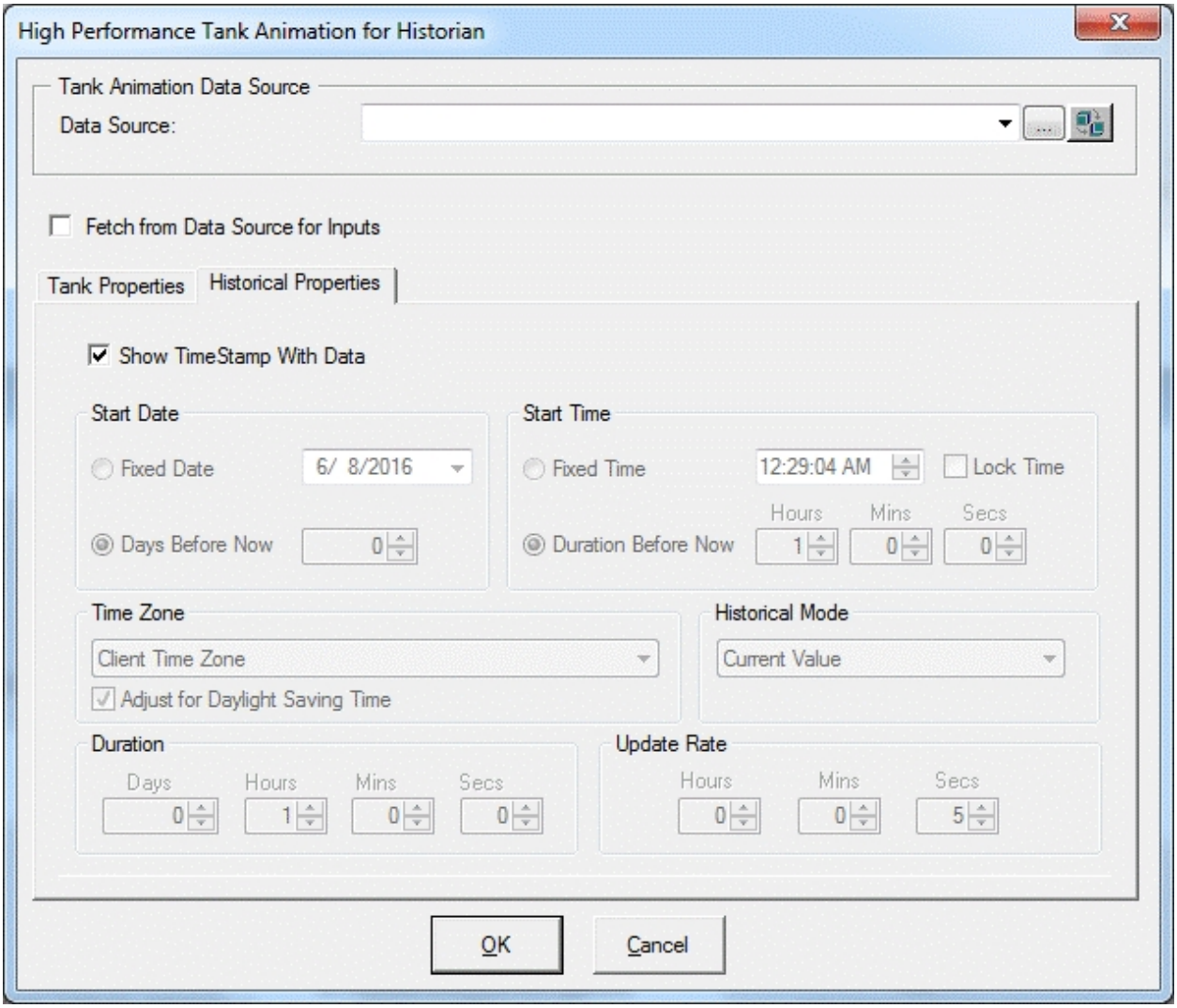
- **Tank Properties Tab** - Opens dialog boxes for Inputs or the data sources for Fetched Inputs based on Fetch from Data Source for Inputs status and other settings for animation, Unit of Measure, and Colors.

Tank Property	Description
Inputs	Allow you to enter the lowest and highest input values to use. Allows you to specify data sources for Lowest and Highest Inputs.
Fetch from Data Source for Inputs	The default data sources are the animation object's LoInValue and HiInValue properties. iFIX reads the EGU (Lo and Hi value) from Historian and then sets them to those properties in run mode. In most cases, you do not need to change them. However, you can use iFIX tags for a work around if needed.
Fill Percentages	Provides a dialog box for the minimum and maximum percentages to use for the TankLevel animation in the dynamo.

Units of Measure	Allows you to select (or de-select) to display the Unit of Measure in the dynamo and specify strings for the Unit of Measure.
Colors	Allows you to accept the default gauge level and label colors or select new colors from the high performance Color Box. The previous illustration shows the default Tank Level and Tank Label colors.

NOTE: Data sources for Fetch Inputs do not support complex mathematical expressions, Picture object properties (other than default animation object's LoInValue and HiInValue) or Global Variables

- **Historian Properties Tab** - Opens dialog boxes to select properties to use with Historian tags.



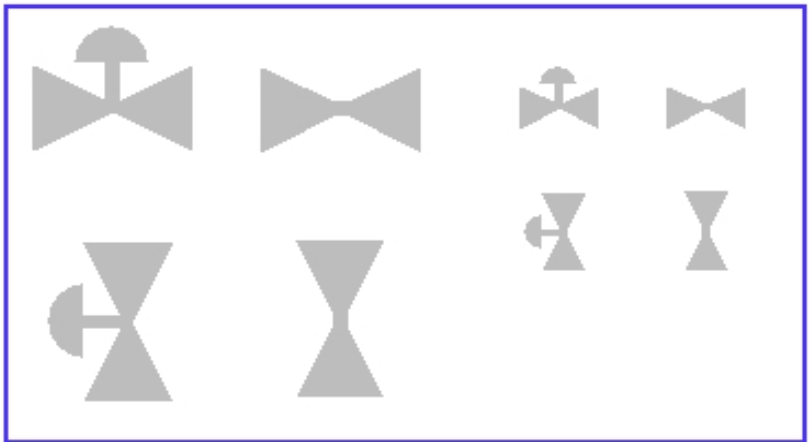
Historian Properties	Description
Show Time Stamp with Data	When the checkbox is selected, a timestamp is shown with the data. Default = Checked.

Start Date	Lets you enter the date to start the data collection. • Fixed Date - Lets you specify a specific date to start gathering data. • Days Before Now - Lets you specify the number of days before today to start gathering data. Default: Disabled since the Historical Mode is the Current Value.
Start Time	Lets you enter the time to begin to collect data. • Fixed Time - Lets you enter a specific time to start gathering data. • Lock - Locks the current time, even if you change the time zone in the Date and Time Properties dialog box in the Control Panel. This field is only available when you designate a specific time to start the display using the Fixed Time field. • Duration Before Now - Allows you to specify the hours, minutes, and seconds before now (current date/time) to start the data collection. Default: Disabled since the Historical Mode is the Current Value.
Time Zone	Allows you to select the time zone for the data. You can also use the checkbox to adjust the time to Daylight Savings Time. Default: Disabled since the Historical Mode is the Current Value.
Historical Mode	Provides a drop-down menu to select the Historian data mode you want to use. Default: Current Value
Duration	Specifies the duration time in days, hours, minutes, and seconds. Default: Disabled since the Historical Mode is the Current Value.
Update Rate	Specifies the update (refresh) rate in hours, minutes, and seconds.

High-Performance Valve Dynamos (HPValves.fds)

Dynamo Set

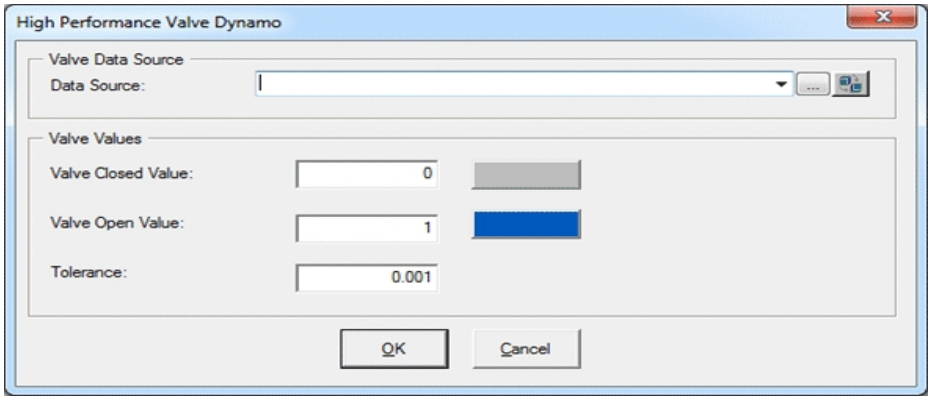
The high-performance Valve dynamo set includes the following dynamos.



Dialog Box

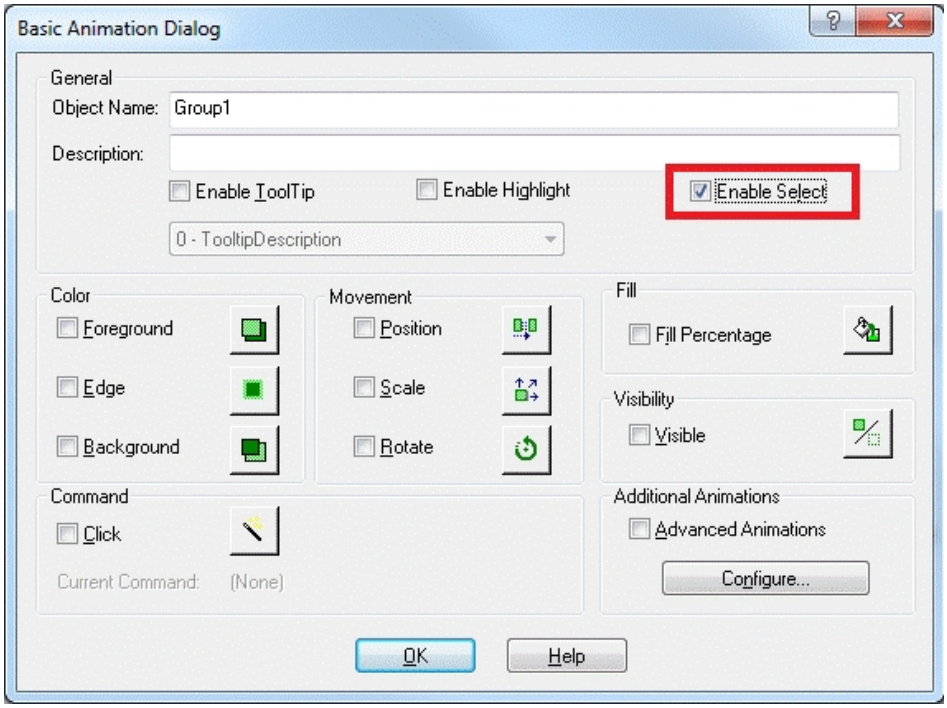
The high-performance Valve Dynamo dialog box contains the following properties:

- Valve Data Source - Allows you to enter the data source that animates the Valve Dynamo. Click the browse button (...) to browse data sources in Expression Builder. Click the down button to view the last data sources you used. These Dynamos are designed to support iFIX real time data, OPC, and Proficy Historian. Proficy Historian data source is supported for the current value.
  NOTE: Currently, this dynamo does not support complex mathematical expressions, Picture object properties, or Global Variables.
- Valve Values - Allows you to enter the following:
  - Valve Closed and Open values - Specify the values for the valve to close or open, and allows you to accept corresponding default colors or select new colors from the high performance Color Box. The following illustration shows the default colors.
  - Tolerance - Specifies the rounding factor to be used for the Valve Closed and Valve Open values. 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.



Controlling Data Sources in a Picture by Group Selection

Proficy Operations Hub allows you to write to tag values associated with an asset's properties in the Proficy Operations Hub Asset Model. It is possible to define a group of objects in a picture that can be selected at runtime, resulting in a control card appearing in which the operator can write to controllable properties of a given asset. This is accomplished with the IsSelectable property in the exported picture JSON file, which is only exported for iFIX Group objects that have Enable Select enabled in iFIX pictures as shown in the following graphic.



With traditional iFIX pictures, checking the Enable Select property allows an object to be selected in the Run-time environment.

With iFIX pictures that are intended for export to Proficy Operations Hub, checking the Enable Select property of a group designates that group as a "click zone" in that picture. A click zone allows properties of a certain asset to be controlled or modified by writing to the associated iFIX tags. When you click on a selectable group that has an asset associated with it, a control card opens to show the current values for a specified set of properties for that asset. Both controllable and non-controllable properties display, based on the configuration of the properties. (Controllable properties are indicated with a gear icon.) Clicking on the control card changes it to Edit view. Edit view allows you to enter new values for those properties. The new values are written to the iFIX database tags when the Confirm button is selected.

For information on automatic click zone binding, refer to the Automatically Binding Child Assets to Click Zones using Group Names section.

NOTE: Use the Property Window to view and to edit the Enable Select property. For more information, refer to the Properties Window section in the Writing Scripts ebook.

Automatically Binding Child Assets to Click Zones using Group Names

When creating the iFIX picture for a certain asset type, specifying a selectable group's name in a certain way results in the click zone being automatically associated with a child asset without further configuration once the exported iFIX picture is associated with an asset type.

In order to take advantage of this automatic click zone binding, the group name must be the same as the child asset's property name in the Proficy Operations Hub Asset Model. Each child asset in the model hierarchy is represented as a property of a parent asset. In order for the automatic binding to associate a click zone with a certain child asset, the group name must exactly match the name of the desired child asset property and the exported iFIX picture must be associated with the parent asset.

Example:

For example, say you have an asset type named StorageTank, which has two child asset properties defined in the model, – InletPump and OutflowPump, of asset type Pump. When creating an iFIX picture for the StorageTank asset type to use with Proficy Operations Hub, you can automatically enable the control card for each of these child assets by:

1. Creating a selectable group of objects within the iFIX picture for each of the child assets.
2. Naming these groups InletPump and OutflowPump. These are the child asset property names as defined in the asset model, (not the child asset instance names for a certain instance of StorageTank).
3. Exporting the iFIX picture from WorkSpace.
4. Importing the exported picture to Proficy Operations Hub and associating it with the StorageTank asset type (assuming that the asset model has already been created/imported).

After doing this, navigating to any StorageTank in Proficy Operations Hub at runtime and viewing the HMI display allows an operator to click on either of these groups of objects to display the control card for that child asset – without the need to navigate to that child asset. This allows control of child assets while in the context of a parent asset.

Rules for Automatic Binding of Group Names

- You must name the group the same as the child asset property of an asset type.
- Only child or other descendant assets of a given asset type can be bound to a click zone in a picture associated with that asset type.
- You can access the control card for grandchild assets and below by using double underscores (__) in the group name to separate each asset level. For example, if the above Pump asset type had a child asset property named RestrictionValve, a click zone could be auto-bound to this grandchild asset from the StorageTank picture by defining a selectable group with the name InletPump__RestrictionValve or OutflowPump__RestrictionValve. This shows the control card for one of these RestrictionValves, depending upon which name you used.
- You can display the control card for the asset type that is associated with the IFIX picture, rather than one of its descendants, by naming the selectable group the same as the asset type. In the previous example, naming a selectable group StorageTank would result in the click zone displaying the control card for the StorageTank itself when that group is selected at runtime.

NOTE: It is not necessary to name the selectable groups in a certain way for them to be able to show the control card for an asset. It is only necessary in order to take advantage of the automatic binding feature. If you do not name them in this way, the click zones will still be selectable at runtime in Proficy Operations Hub, but will require further configuration in Proficy Operations Hub Administration in order to associate them with the desired assets for control at runtime.

Referencing a Model Property in an Animation

You can reference a model property within an animation. To reference a model property in an animation, you must type @ (at sign) at the beginning and at the end of the property name. This allows the GE Web HMI software to differentiate the property name from ordinary text.

Example:

To enter a reference in an animation to the pump1.speed property in the model:

1. Enter the following in the Fill Expert as the Fill Data Source:

   @pump1.speed@

2. Export the picture using the Export Operations Hub Picture utility. The following line appears in the JSON file:

   "tag": "@pump1.speed@"

For more information on animations, refer to the Creating Pictures ebook.

Picture Design Tips

Use the following design tips when creating a high-performance graphic:

- When organizing your view of the process, think in terms of a model. Be sure to build Proficy Operations Hub pictures and tag names from that perspective.
- Use tag group aliases that correspond with a model paradigm that uses one of the following forms:

  - @PropertyName@

  - @AssetPropertyName@

  - @AssetChildAsset.PropertyName@

- Build your pictures with the Web_HMI Toolbox.
- Use the Proficy Operations Hub supported graphics, animations, and dynamos.
- Use the Proficy Operations Hub supported high performance Color Box.
- Minimize client-side scripting; scripts are not exported to Operations Hub.
- Create new Proficy Operations Hub iFIX pictures or be prepared to rework existing pictures.
- Enable high performance graphics when using dynamo sets to optimize behavior and to ensure that all Proficy Operations Hub tools are available.

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