



PI Coresight 2013

User Guide

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Contents

Introduction.....	1
Getting started.....	1
Homepage.....	1
PI Coresight workspace.....	4
How work is saved.....	5
Search.....	7
Search and add data to a display.....	7
Use the breadcrumb trail to search.....	8
Filter search queries.....	9
Metadata matching.....	9
About PI data.....	10
PI tags (PI points).....	10
PI AF assets.....	11
PI AF attributes.....	11
Time series data.....	11
Calculated data.....	11
Contextual data.....	11
Displayed data formats.....	11
Visualization.....	13
Symbols.....	13
Symbol types.....	13
Move a symbol.....	21
Delete a symbol.....	22
Change symbol type.....	22
Apply a row or trace to a symbol.....	22
Timebar control.....	23
Change the time range for a display.....	23
PI time.....	24
Displays.....	27
About sharing displays.....	27
Create a new display.....	27
Open a display.....	27
Name a display.....	28
Save a display.....	28
Copy a display.....	28
Navigate displays.....	28
Undo and Redo.....	29
Embed a display in another display.....	29
Reusing and comparing related assets.....	29
Reuse a display for different assets.....	29
Reuse a symbol for different assets.....	30
Use a table or trend to compare different assets.....	30
Discovering and analyzing events.....	31
Discover related events.....	31
View event information.....	32
View event attribute values.....	32
Analyze data items during the time range of an event.....	33

Contents

Analyze a trend during the time range of an event.....	33
Lock the Events list during analysis.....	33
Compare multiple events with locked trends.....	34
Cart.....	35
Add a symbol to the Cart.....	35
Add a display to the Cart.....	36
Reuse Cart items in a display.....	36
Change the name of a symbol in the Cart.....	36
About saving Cart entries.....	37
Delete Cart items.....	37
Additional topics.....	39
PI Application Server Administration.....	39
Data exported from a display.....	39
Save an error log.....	39
Bookmarks.....	40
Multilingual support.....	40
Technical support and other resources.....	43

Introduction

PI Coresight is a web browser-based application that enables you to easily retrieve, monitor, and analyze process engineering information. PI Coresight allows you to:

- Search for and visualize time-series or other PI System data.
- Save entire displays or components of a display for easy retrieval and further analysis.
- Drag-and-drop to reuse search results or components in new displays.
- Share displays with other members of a group or anyone with access to PI Coresight.

This guide describes the main features of PI Coresight and how to work with the application.

For more technical information, such as system requirements and installation procedures, see the installation and administration guide for PI Coresight.

Getting started

Start using PI Coresight by browsing to the PI Coresight application server, which is typically located at:

`http://<server name>/Coresight`

When you first open PI Coresight in your Web browser you see the Homepage. The majority of your time, however, will be spent working in the PI Coresight Workspace.

Homepage

Each time you create a display, PI Coresight automatically saves a copy of it on the server. The Homepage gives you two ways to view saved displays:



Display Management. Shows a list of all saved displays. This view gives additional details about a display such as access date, creation date, and author. It also allows you to set a display to be public or private, and provides the ability to delete displays.



Thumbnail View. Shows thumbnail images of the sixteen most recent displays. You can also pin the position of displays in this view so that they persist even as new displays get added.

Make a display public and available for sharing

To share a display you first need to make it public so that others in your organization have access. A shared display opens as read-only for anyone who is not the owner of the display. You can make changes to the read-only shared display, but in order to save those changes you must give the display a new name so that it saves as a new display.

You can make a display public from the Homepage or from the PI Coresight Workspace.

Make a display public from the Homepage

Procedure

1. Navigate to the **Homepage**. This page is the default start page. If you are in the PI Coresight workspace, click the **PI Coresight homepage** link in the top left corner of the screen. The **Homepage** loads in whatever view you last had it open.

2. Click the **Display Management** button . The **Homepage** switches to List view, and a


list of all available displays appears.

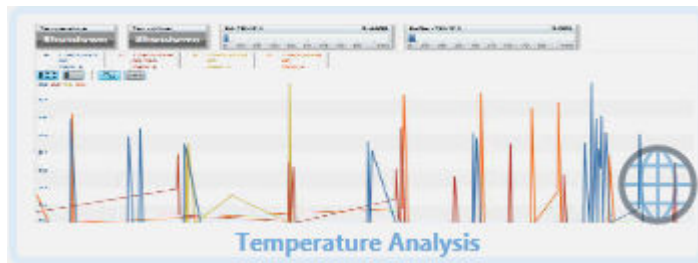


Note:

With your mouse pointer, move over a display name link to see a thumbnail view of the display without leaving list view.

3. Select the **Public** check box next to each display you want to share. You can also use this screen to make a display read-only.

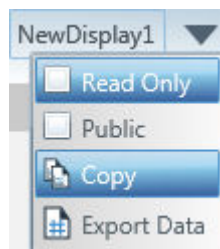
Once a display is made public, a globe icon  appears on the display when viewed in thumbnail view. The icon also appears when you open the display in the PI Coresight workspace next to the display name on the toolbar.



Make a display public from the PI Coresight Workspace

Procedure


1. In the Workspace click the arrow next to the title that appears in the title bar. A drop down menu appears.



2. Select the check box next to Read Only or Public. Your changes take effect immediately.

Delete a saved display

Procedure


1. Navigate to the **Homepage**. This page is the default start page. If you are in the PI Coresight workspace, click the **PI Coresight homepage** link in the top left corner of the screen. The **Homepage** loads in whatever view you last had it open.
2. Click the **Display Management** (list view) button .

The **Homepage** switches to list view, and a list of all available displays appears.



Note:


With your mouse pointer, move over a display name link to see a thumbnail view of the display without leaving list view.

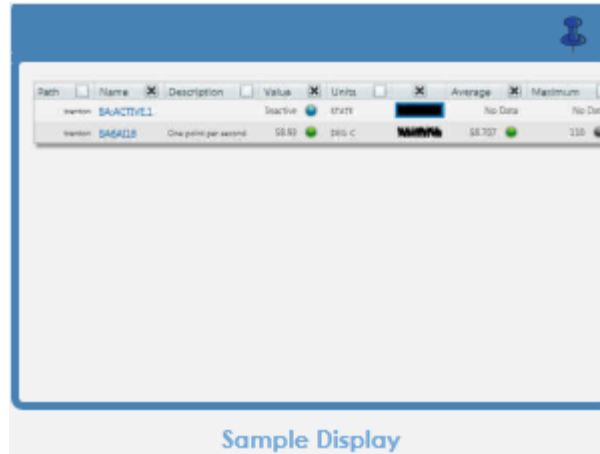
3. Select the corresponding **Selected** check box next to the name of the display you want to delete.
4. Click the **Delete Selected** button  located next to the **Selected** column header. The display is removed from both the list view and thumbnail view of the **Homepage**.

Save recently used displays

PI Coresight automatically saves the sixteen most recently used displays in the **Homepage** (thumbnail view), however you can persist the inclusion of any sixteen display thumbnail images in this list so that they always appear in your thumbnail view.

Procedure

1. Navigate to the **Homepage**. This page is the default start page. If you are in the PI Coresight workspace, click the **PI Coresight homepage** link in the top left corner of the screen. The **Homepage** loads in whatever view you last had it open.
2. On the **Homepage**, click the thumbnail view icon .
3. On the **Homepage** (thumbnail view), move your pointer over the display thumbnail. A blue title bar appears over the image.



4. Click the pin icon located on the right side of the title bar. The icon rotates to reflect a pinned state, and the display thumbnail is preserved in the list of thumbnails. A reference to the display also appears in the **Homepage** (list view).

PI Coresight workspace

The main workspace consists of the Search pane, Cart pane, and display area. The timebar control is aligned horizontally at the bottom of the workspace.

You can:

- Resize each pane by clicking and dragging the inside border of a pane.
- Expand or collapse the display area pane by clicking the expansion bar in the middle of the pane's border.

The screenshot shows the PI Coresight Workspace interface. The interface includes a top menu bar with 'planOverview', a search pane on the left, a main data table, a large line chart, and several smaller data widgets at the bottom. Eight numbered callouts point to specific UI elements:

1. Link to homepage
2. Search pane
3. Menu bar with display title (editable)
4. Expansion bar
5. Cart pane
6. Timebar control
7. Canvas
8. Symbols

PI Coresight Workspace

How work is saved

PI Coresight automatically saves all updates to a display without requiring you to click a save button or take any further action. The automatically saved displays are retrievable in the search and are listed in the Homepage.

Search


Before you can visualize your data, you need to find it. PI Coresight lets you search for system resources without the need to know the name, category, or type of data you wish to retrieve.

Use PI Coresight to search for PI data from all of your PI Systems, PI AF databases, or to search for previously saved displays created with PI Coresight. Search results are returned in a single results list. With your mouse pointer, move over any item in the search results list for a ToolTip that shows the PI Server or PI System where the data originates, as well as a description of that data item.

Search and add data to a display

Use the Search pane to locate data from the PI System, such as PI tags and PI AF attributes. You can also search for previously saved displays. Once you have found the data you want to visualize, you can then convert them into dynamic symbols to draw on a display.

Procedure





1. Enter a search term in the search box located at the top left corner of the screen, and click the search icon .

**Note:**

A wildcard operation (*) is always assumed after each search query entered.

Use the filter query buttons to limit your search results.

A list of search results appears in the Search pane. An icon appears next to each result to let you know what type of data it is. Here are some examples:

- PI tag  Sinusoid
- AF element  Boiler-125
- AF attribute  K-026|Steam Flow
- PI Coresight display  Reactor 5-B

If your search term appears in the metadata of the search result, the search result appears with an orange icon.

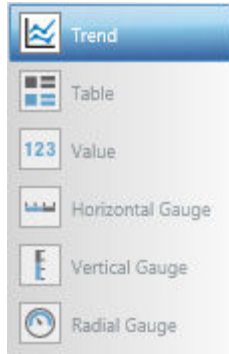
2. Click a data item from the search results list and drag it onto the display area.

As you drag an item notice the drop action indicator changes from red to green to signify where you are able to place it in a display.

**Note:**

Press CTRL or SHIFT and click to select multiple items.

3. A drop-down menu of available symbol types appears. Select one from the list.



Note:
After you select a symbol type it becomes the default type. You can create a symbol with the default type by selecting a search result and pressing ENTER.

4. Click a symbol type icon. The symbol appears on your display using the selected symbol type.

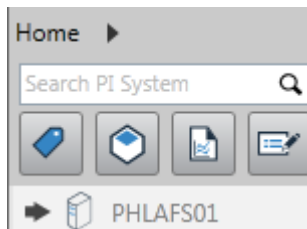
Use the breadcrumb trail to search

PI Coresight shows a breadcrumb trail of search links to help you visualize the hierarchy of your PI Server and PI System assets.

This feature is especially useful for finding PI AF assets and attributes as it allows you to drill down through the PI AF hierarchy for assets within your connected PI AF databases.

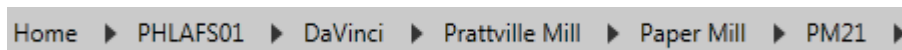
Procedure

1. Open a display. When you first open a display you see a link to your available PI AF servers appear in the search results. In this case we see the server PHLAFS01.



Note:
By default your connected PI AF Servers appear in the initial search result pane. Click the arrow next to the Home link to see both your connected PI Servers and PI AF servers in one list.

2. Click the arrow next to the PI AF server icon to display the PI AF databases available to that server. A breadcrumb trail starts to form that originates from the PI AF Server down through the PI AF hierarchy to your PI AF assets. Any search results returned are filtered from the current breadcrumb level down.



3. Other options:

- Click any of the breadcrumb links to return search results from that level in the hierarchy. This action automatically updates your existing search results.
- Click the arrow next to any breadcrumb link to show that object's children.

**Note:**

An asset without any attributes appears grayed-out in the search results.

Filter search queries



Use the buttons under the search text box to filter results to restrict a search by excluding certain data items. From left to right the buttons filter:

- PI tags
- PI AF elements and attributes
- preexisting displays
- data item results based on metadata matching

Alternately, you can also enter a filter query directly in the search box.

Procedure

1. Click inside the search text box.
2. Type:

`datatype:<datatype> <search term>`

**Note:**

Type the keyword `datatype` as one word and do not put a space after the colon (:). For example, enter: `datatype:float`

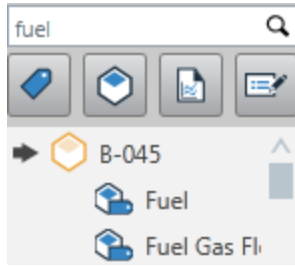
Use any of the following for `<datatype>`:

- boolean
- digital
- float
- integer
- string
- time

Metadata matching

Results that appear in orange indicate that the search term appears in the metadata of that particular search result.

For example, an exact match of the search term appears in the attribute name of an asset. In this case the icon next to the search result for the parent asset would appear in orange, but the attribute would not.



If a perfect match for a search term exists inside a display, or within the description of a PI tag, the icon for the display or PI tag also appears in orange within the search results. For example, if you search for the term 'sinusoid' any displays that contain the PI tag 'sinusoid' appear with an orange icon.



About PI data

You can retrieve and visualize data from your PI System and other systems that support different business functions and provide access to diverse information.

You will likely work with PI data stored in:

- PI Server
- PI Asset Framework (PI AF)

You will typically use these items to specify the information you want to see:

- PI Tags (PI Points)
- PI AF Assets
- PI AF Attributes

Different types of data perform different functions:

- Time series data
- Calculated data
- Contextual data

PI tags (PI points)

A **PI point** is a stream of real-time data from a defined source, and is described by a corresponding tag name and other attributes. PI points are frequently referred to as PI tags, and the terms are used somewhat interchangeably. However, a tag is simply a reference name for a PI point.

PI AF assets

PI AF assets are the building blocks of PI AF (like modules in MDB) and can represent either physical or logical entities in your process, such as a physical device, piece of equipment, storage container, or representative section of a process.

PI AF attributes

PI AF attributes represent data that is associated with an element. They can contain configuration information for the element, or measured or calculated process data that provides the information necessary for getting and setting its value to and from a data stream. Conceptually, a PI AF attribute replaces the PI aliases and PI properties that were used in the PI Module Database.

PI AF attributes are children of PI AF elements.

Time series data

PI Server data is collected and stored in the form of points, each of which represents a time-series data stream from a particular source, such as a temperature or pressure sensor. A tag is a reference name for a PI point.

Calculated data

Statistical calculations allow you to view Averages, High and Low values, and measures of variance. These all provide critical information about data events over a period of time.

Contextual data

Contextual data is a method of associating PI points and their properties with their business use, location, service or role. A content creator can configure contextual data to reflect the structure of the information, making data and its presentation more logical and accessible. A PI point tag name is an example of contextual data.

PI points also have various configurable properties associated with the data, called point attributes. However, this information is presented largely in language relevant to data processing, not in measurements or standard business terms that are easily accessible to users outside the Operations department.

PI AF provides a holding place for contextual representations of all data used in your PI System. Elements and attributes can reference PI points and attributes or data in other systems, including relational databases and web services.

Displayed data formats

PI Coresight displays numeric and date-time values in standard, easy-to-read formats.

Your computer's locale settings, for region and language, determine:

- Date and time formats
- Decimal marker and thousand separator for numeric data (to display "12,525.7" as opposed to "12.525,7" for example)

Default formatting for units of measure, scale ranges, scientific notation, significant digits, and decimal places can be specified by settings for the data item. Contact your PI Coresight administrator for more information.

Visualization

The ability to visualize your data on a display is a core feature of PI Coresight.

Symbols

Symbols are container objects that allow you to visualize data on a display. Depending on the symbol type, you can add multiple data items per symbol. You can continue adding data items after you create a symbol by dragging and dropping from the search results list or from the Cart. Symbols can show both dynamically updated data and static data.

Once added to a display, you can rearrange symbols around the display area. You can also drag and drop symbols into the Cart where you can save and reuse components of the symbol for later use.

Use any of the following symbol types to see your data:

- [Trend](#)
- [Value](#)
- [Table](#)
- [Gauge](#) (horizontal, vertical, or radial)

What do you want to do?

[Move a symbol](#)

[Delete a symbol](#)

[Change symbol type](#)

Symbol types

PI Coresight offers four symbol types that you can use to visualize data. Some symbol types can contain multiple data items, while others can only contain a single data item.

Symbol Type	Data Items Allowed
Trend	Multiple
Table	Multiple
Value	Single
Gauge	Single

Trend

A trend is a dynamic symbol that lets you view values plotted against time. Trends can show the value of one or more data items over a time period. Trends are typically used to display time series data, though they may also include non-time series data as well.



The numbered items in the figure show some components of a trend:

1. **Value scale.** Shows the range of values that appears within a trend.
2. **Toggle value scale.** Allows you to change a single scale trend to a multi-scale trend and back again. Only valid if the trend is configured with multiple data items.
3. **Trend legend.** Provides quick details about data items that are part of a trend. These details appear at the top of the trend and include the data item's name, value, and unit of measure. The color of the legend corresponds with the trace line used to draw the data on the trend.
4. **Traces.** The lines drawn on a trend that represent a series of data points from a data item. Sometimes a trace appears broken with a small x icon on each end of the break. This represents an interruption in the data item when no data was recorded.
5. **Bands.** Help you visualize the data axis across the length of a trend with alternating white and gray bands that are automatically generated.
6. **Track point guide.** Helps you view your data with precision by showing a track line, track ball, and time stamp. Track points are synchronized across multiple trends. Moving the mouse pointer over a trace changes the legend value to correspond with the time of the track point.
7. **Lock button.** Allows you to create a frozen snapshot of the trend for further analysis.
8. **Change symbol type button.** Allows you to change a symbol type on your display to appear as another type of symbol.

Trend components

Traces

A **trace** is a single line on a trend. When a trace is **continuous**, a line is drawn from measurement to measurement. When a trace is **discrete**, the value is propagated forward until a new value is recorded in the database. This results in horizontal and vertical lines for the tag (staircase trace).

Digital points are discrete type measurements, producing staircase traces. For digital points, the offset from the starting digital state code is plotted.

Staircase traces are used for points from a PI Server that have a Step Flag set to TRUE.

When a value is outside the limits defined for the trend, it is plotted as over- or under-range. When a value is out of range or has a bad value, it is not shown on the plot. An X marker is placed on the trend at the beginning and end of the time when data are not plotted. When the data are missing, (for example, not connected to a server) they are given the value No Data and are not plotted.

Delete a trace



Procedure

1. In a trend, use your mouse pointer to hover over a data item in the trend legend. The data item is highlighted and an X icon appears next to its name.
2. Click the X to remove the data item and its corresponding trace from the trend.

Value scale

Data values on a trend appear within a range of values that is referred to as the value scale. By default, the value scale shows a separate scale for each data item (represented by a trace) with the highest high and lowest low values of all the data items for the time range specified in the timebar.

You can change the value scale to use a single consolidated scale for all data items, as opposed to separate scales for each data item. Value scale settings persist per trend even after you close a display.



- Choose to show either separate scales or a single scale:
 -  **Show separate scales.** Separate high and low values appear for each individual data item on a trend. Incremental scale values are shown for the first trace.
 -  **Single scale.** There is only one value scale comprised of the lowest and highest plotted values. You can choose one of the data items to serve as the single scale or you can choose a scale spanning the lowest value and highest values of the scales for all the traces in the trend.



Note:

These settings apply regardless of whether you set the scale according to minimum and maximum values of the trend's time range or to their configured values.

Other trend scale options:

-  **Set scale to the minimum and maximum plotted values of the trend's time range.**
-  **Set scale to the data item's configured minimum and maximum values.**
 - For PI tags, these values are based on the zero and span attributes.
 - For PI AF attributes, these values are based on zero and span attributes for PI point data references and the minimum/maximum values for other data references.

Choose multiple scales or a single scale for the value scale

Use the value scale buttons to show either a single scale



or separate scales



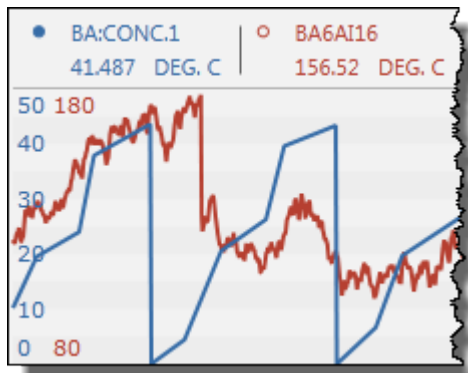
for the value scale in a trend.


Procedure

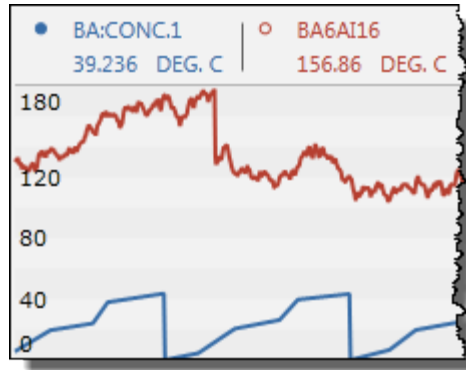
1. Move your pointer over a symbol. A control bar appears at the top of the symbol.




By default, the value scale includes multiple scales, one for each trace in the trend. Each scale shows a pair of high and low limits along the top and bottom of the value scale. The limit values match the color of the trace and the data items on the trend legend.



2. To use a single scale for the trend, click the single scale icon  and select either the name of the trace whose scale you want to use, or select **All** to produce a concolidated scale that ranges from the lowest value to the highest value from the scales for all of the traces. These values are marked in a single vertical column along the left side of the trend\.




3. Click the separate scales icon  to show multiple scales in the value scale.

Configure display properties for a trend

You can show or completely hide a data item. You can also show or hide selected display properties for any data item.

Procedure

1. Mouse over a trend to make the control bar at the top visible.
2. Click the **Configure** button  on the left of the control bar to open the configuration table.
3. Select items to show or hide for the data items in the trend.

	Name	Description	Value	Average	Minimum	Maximum
<input checked="" type="checkbox"/>	IntenseData	One point per second	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>	PM21 AttributeType222		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	PM21 Couch Vacuum	12 Hour Sine Wave - test	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	H-690 Burners	Burner Model	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

- To completely hide a data item, clear the left-most check box in the row.
- Select **Value** to show a trace for the data item.
- Select **Average**, **Minimum**, and **Maximum** to show horizontal lines for the average, minimum, and maximum values of a data item using the display range as the time interval.

Zoom in a trend

The trend zoom feature is a powerful analysis tool that allows you to zoom in on a particular range of time and value.

Zooming in a trend changes the start and end time for the *entire display*, thus affecting all symbols except for locked trends.

Procedure

1. Drag your pointer over any area of a trend. The area you drag over remains illuminated, while the remaining portions of the trend are grayed out.
2. Release the pointer. The trend redraws, zooming in on the area you just selected. The start time and end time of the display, and all trend traces are adjusted accordingly.




Note:

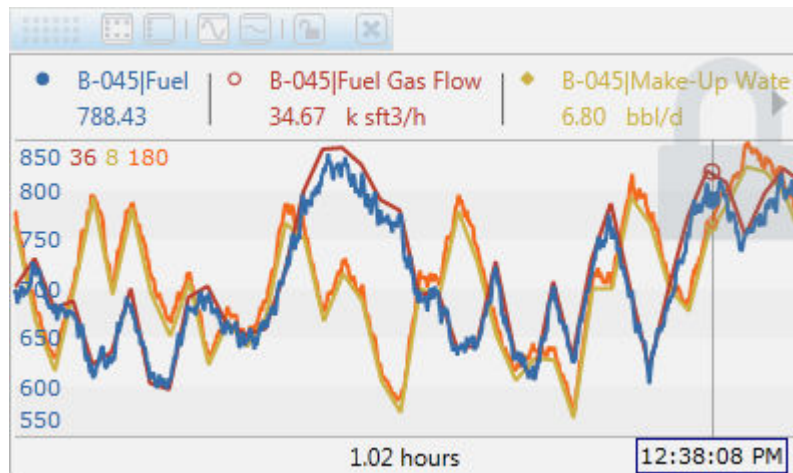
Click the Undo button to cancel a trend zoom.


Lock a trend for analysis

The trend lock feature enables you to freeze a trend in time and then compare that snapshot with other trends. Once you lock a trend, it no longer responds to changes in the timebar control, and data items stop updating. As with any other symbol in PI Coresight, you can drag a locked trend into the Cart and then reuse components such as the start and end time to further analyze the snapshot you have saved.

Procedure

1. Move your pointer over a trend in a display. The trend's symbol control bar appears at the top.
2. Click the **Lock** button  on the trend's symbol control bar. The trend is now locked. A lock indicator watermark appears in the top right corner of the trend. Also, the start and end times, and duration of the locked trend appear at the bottom of the trend. The timebar control does not affect the trend while it is in the locked state.



Locked trends are unlocked by clicking the unlock button  in the trend's symbol control bar. When a trend is unlocked, the time scale is no longer shown and the trend shows data for the time specified in the time bar.

Table

Use the table symbol to add one or more data items to a display in a table format.

Name	Description	Value	Units	Trend	Minimum	Maximum
Sin_usold	12 Hour Sine Wave	15.862	degree		1.0389	22.36
Boiler-210 Make Up W	Make-Up Water Flow	10.41	bb/d		1.03	12.95
BA: EMF .1	Reactor 1 temperature	44.782	DEG C		0	49.796

- 1. Drag Area.** Click and drag this area to reposition your table.
- 2. Sort Columns.** Click the arrow next to a column heading to sort columns. Clicking the heading more than once reverses the sort order.
- 3. Configure Symbol.** Click to add or remove table columns.
- 4. Trend Preview.** Click to open a preview of the entire table, including all data items, as it appears in a trend.
- 5. Change Symbol Type.** Change the table to another symbol type.
- 6. Sparkline.** Click the sparkline image to open a preview of that single data item as it appears in a trend.

**Note:**

The preview trend is locked to the current time and does not update. Only one preview trend is available at a time. The preview can be moved and resized.

Remove a table row

Procedure

1. Click anywhere inside a table row. The row is highlighted and an X button appears to the far left. Use the CTRL or SHIFT keys to select multiple rows for removal. When selecting multiple rows, the X button only appears next to the last row selected.

Name	Description	Value
CSElem1 FormulaMinM		11
<input checked="" type="checkbox"/> PM21 Break Status	Down/Break/On Sheet	5.95536
PM21 Parent		

2. Click the X button. The selected rows are removed from your table. You can also click inside the row you want to delete and press DELETE.

About table columns

The table symbol contains columns that include the name, value, description, and other summary data about a data item. These summary data values take their intervals from the display's time range as defined in the time bar. Click the configure symbol button in the table's control bar to add or remove these columns.

- **Path.** The full path of the data item. For PI tags, this is the path to the PI Server. For PI AF assets and attributes the path is the entire PI AF path up until the last asset/attribute pair.



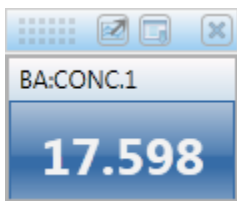
Note:

Longer path names are truncated. Move the mouse pointer over the truncated path name to get the full text in a tool tip.

- **Name.** The name of the data item (for example the PI tag, or asset/attribute pair).
- **Description.** The description as defined in the descriptor property for PI tags or the description attribute for PI AF data.
- **Value.** The reading/snapshot obtained at the specified end time of the time bar. It is shown as a number or a digital state string.
- **Units.** The unit of measure used for the data item.
- **Time.** Shows a time stamp for when the value was last updated.
- **Trend.** A graphic that provides a quick way to see how a data item is trending. For example, if an operator notices that the volume of a sparkline is escalating rapidly, it may be an indication that there might be a problem that requires further analysis.
- **Average.** The average value of the data item using the display range as the interval.
- **Minimum.** The minimum value of the data item using the display range as the interval.
- **Maximum.** The maximum value of the data item using the display range as the interval.
- **StdDev.** The standard deviation of values on the display range.
- **Range.** The difference between a data item's maximum and minimum values.
- **PStDev.** The population standard deviation of values on the display range.

To resize columns hover your mouse cursor over a column separator in the table heading and move the double-arrow cursor to the appropriate width. Change the column order by clicking on a column header and dragging it to another location on the table, either left or right.

Value



Use the value symbol to show the value of a data item on your display. A value is the reading obtained for a data item at the end time of a display. It is shown as a number, time stamp, string, or digital state.

Value symbols are dynamic (unless the time bar is in a non-updating state) and update each time the underlying data item updates. You can hover with your mouse over a value symbol to show a tooltip with additional information about the data item.

**Note:**

When you create a value symbol from a data item that is in a null or shutdown state, the value symbol is darkened.

Gauge

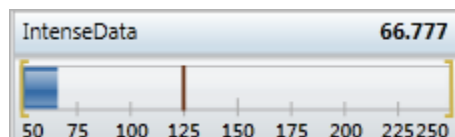
Gauge symbols provide a graphical view of the reading/snapshot at the end time of the display range, and allow you to monitor and determine at a glance whether that value is within an acceptable range. A gauge can be linear or radial. Gauges provide a scale, tick marks, ranges, and a pointer that indicates the current value. Gauges also provide bars that indicate the minimum, maximum, and average values for your data item. If you hover over a gauge symbol with your mouse pointer a tooltip appears with additional information about your data item.

**Note:**

When you create a gauge symbol from a data item that is in a null or shutdown state, the gauge symbol shows in black.

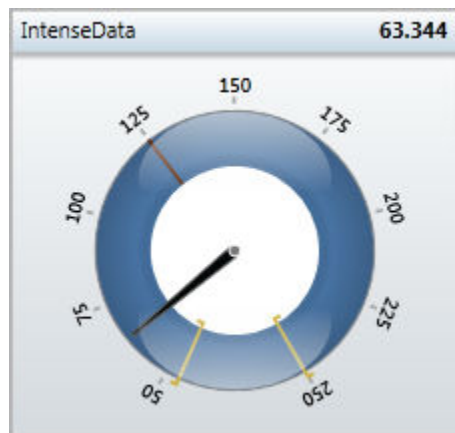
Linear Gauge

Linear gauges can be aligned either horizontally or vertically.



Radial Gauge


The radial gauge is similar to a linear gauge in every respect except shape.



Move a symbol


Once you have added a symbol you can rearrange where it appears on your display. You can also drag and drop symbols into the Cart where you can save and reuse components of the symbol for later use.

Procedure

1. Move your pointer over a symbol. A control bar appears at the top of the symbol.
2. Click the drag area  on the control bar and drag the symbol to either another location within your display or the Cart.


Delete a symbol

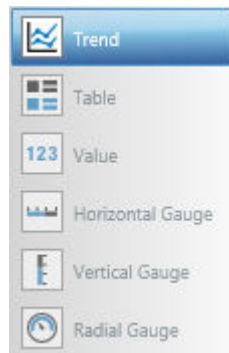
Procedure

1. Move your pointer over a symbol. A control bar appears at the top of the symbol.
2. Click the **Delete** button  in the top right corner.

Change symbol type

Procedure

1. Move your pointer over a symbol. The symbol control area appears at the top of the symbol.
2. In the symbol control area, click the **Change Symbol** button . A drop-down menu of available symbol types appears.



3. Click a symbol type.

Multi-data item symbols can only transition into other multi-data item symbols. For example, tables can transition to trends and trends to tables. If a trend or a table only has one data item then it can transition to any other symbol.

Apply a row or trace to a symbol

You can apply a single row from a table or a trace from a trend to create or add to another symbol in the display.

Procedure

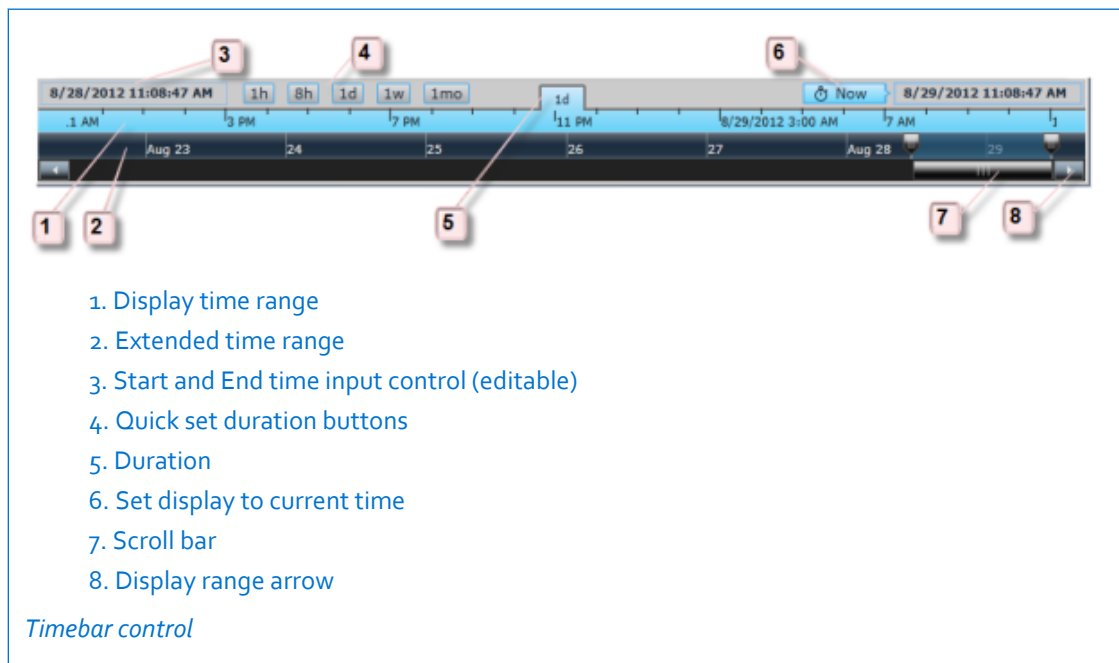
1. Select a row or the name of a trace and drag it out of its table or trend.
2. Do one of the following:
 - Drop it on the display to create a new symbol for the data item.
 - Drop it on another table or trend to add it there as a new row or trace.

Timebar control

The timebar control at the bottom of the workspace shows the start and end time for all symbols on your display. The duration of the display time range appears in the space between the start and end times, and is initially set to 8 hours. The timebar control accepts valid PI System and Windows times, and launches an error message in the event you enter an unsupported time format. See PI Time for more information on acceptable inputs.

If the end time for the display time range is set to Now (*) symbols on the display will dynamically update as information from their data items changes. (Note, however, that a locked trend with a fixed end time can dynamically update only when it is unlocked.)


Under the display time range, the extended time range includes an adjustable scrollbar you can use to control the display time range. Drag the scrollbar within the extended time range or adjust its start and end slider controls to change the display time range.




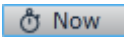
Change the time range for a display

The timebar control governs the time range for all symbols in a display. Use any of the following methods to change the time range:

Procedure

- In the timebar control, click any of the duration buttons **1h** **8h** **1d** **1w** **1mo**. This action resets the start time to accommodate the duration you select. The end time does not change.
- Use the thumbwheels  to change the start (left) or end (right) times of a display. By default, the display range is set with an end time of *, a current time that constantly updates

every 5 seconds, and a start time of *-8h. As you adjust the thumbwheels, the display range zooms in and out accordingly.

- Move the left thumbwheel to adjust the start time of data on your display.
- Move the right thumbwheel to adjust the end time.
- Click to the left or right of the scrollbar to move the display range one duration span before or after the current display range.
- Click the arrows next to the scrollbar control to shift the display range forward or backward in time in increments of one-eighth the display range.
- In the timebar control, click either the start or end time, or pencil icon . An editable field appears that allows you to enter a new start time or end time to edit the time value. If the end time is set to an absolute time, or any time other than current time, the display will not update.
- In the timebar control, click the **Now** button . Once set, the **Now** button and display range remain highlighted and your symbols dynamically update.
- From the Cart, drag and drop the start or end time, or time range from any symbol you have saved there onto a display. The display's time range automatically updates with the saved Cart time value.

PI time

You can use a special syntax, called PI time, to specify inputs for time stamps and time intervals. PI time uses specific abbreviations, which you combine to create time expressions.

PI time abbreviations

When specifying PI time, you can use specific abbreviations that represent time units and reference times.

Time-unit abbreviations

Abbreviation	Time unit
s	second
m	minute
h	hour
d	day
mo	month
y	year
w	week

To specify time units, you can specify the abbreviation, the full time unit, or the plural version of the time unit, such as s, second, or seconds. You must include a valid value with any time

unit. If specifying seconds, minutes, or hours, you can specify a fractional value, such as 1.25h. You cannot specify fractional values for other time units.

Reference-time abbreviations

Abbreviation	Full version	Reference time
*		Current time
t	today	00:00:00 (midnight) of the current day
y	yesterday	00:00:00 (midnight) of the previous day
sun ¹	sunday	00:00:00 (midnight) on the most recent Sunday
jun ²	june	00:00:00 (midnight) on the current day in june of the current year
dec <i>DD</i>	december <i>DD</i>	00:00:00 (midnight) on the <i>DD</i> th day of december in the current year
<i>YYYY</i>		00:00:00 (midnight) on the current day and month in year <i>YYYY</i>
<i>M-D</i> or <i>M/D</i>		00:00:00 (midnight) on the <i>D</i> th day of month <i>M</i> in the current year
<i>DD</i>		00:00:00 (midnight) on the <i>DD</i> th day of the current month
<p>¹: Use the first three letters as an abbreviation for any day of the week: sun, mon, tue, wed, thu, fri, or sat. ²: Use the first three letters as an abbreviation for any month of the year: jan, feb, mar, apr, may, jun, jul, aug, sep, oct, nov, or dec.</p>		

PI time expressions

PI time expressions can include a reference time and a time offset, indicated by a direction (either + or -) and a time unit with a value. PI time expressions might include:

- Only a reference time, such as t
- Only a time offset, such as +3h
- A reference time with a time offset, such as t+3h

A reference time can be a fixed time, such as 24-aug-2012 09:50:00, or a valid reference-time abbreviation, such as t.

You can only include one time offset in an expression. Including multiple offsets can lead to unpredictable results. For example, the following time expressions are *not* valid:

- *+1d+4h
- t-1d+12h

Time-stamp specification

To specify inputs for time stamps, you can enter time expressions that contain:

- Fixed times

A fixed time always represents the same time, regardless of the current time.

Input	Meaning
23-aug-12 15:00:00	3:00 p.m. on August 23, 2012
25-sep-12	00:00:00 (midnight) on September 25, 2012

- Reference-time abbreviations

A reference-time abbreviation represents a time relative to the current time.

Input	Meaning
*	Current time (now)
3-1 or 3/1	00:00:00 (midnight) on March 1 of the current year
2011	00:00:00 (midnight) on the current month and day in the year 2011
25	00:00:00 (midnight) on the 25th of the current month
t	00:00:00 (midnight) on the current date (today)
y	00:00:00 (midnight) on the previous date (yesterday)
tue	00:00:00 (midnight) on the most recent Tuesday

- Reference-time abbreviations or fixed times with a time offset

When included with a fixed time or a reference-time abbreviation, a time offset adds or subtracts from the specified time.

Input	Meaning
*-1h	One hour ago
t+8h	08:00:00 (8:00 a.m.) today
y-8h	16:00:00 (4:00 p.m.) the day before yesterday
mon+14.5h	14:30:00 (2:30 p.m.) last Monday
sat-1m	23:59:00 (11:59 p.m.) last Friday
1-jan-11-1d	00:00:00 (12:00 a.m.) December 31, 2010

- Time offsets

Entered alone, time offsets specify a time relative to an implied reference time. The implied reference time might be the current clock time or another time, depending on where you enter the expression.

Input	Meaning
-1d	One day before the current time
+6h	Six hours after the current time

Time-interval specification

Time-interval inputs define intervals for collecting or calculating values during a time period. For example, you might specify a 60-minute interval to compute an hourly average over a 12-hour period. To specify time-interval inputs, enter a valid value and time unit:

- Positive values define intervals that begin at the earlier time in the period and that finish at or before the later time in the period.

Start time	2:00:00
------------	---------

End time	3:15:00
Time interval	30m
Returned intervals	2:00:00 to 2:30:00 2:30:00 to 3:00:00

- Negative values define intervals that finish at the later time in the time period and that begin at or after the earlier time in the period.

Start time	2:00:00
End time	3:15:00
Time interval	-30m
Returned intervals	2:15:00 to 2:45:00 2:45:00 to 3:15:00

Displays

Displays are containers for drawing symbols on your canvas. They are the foundation for visualizing data in PI Coresight.

About sharing displays


Displays are automatically saved in PI Coresight. As the creator of a display you have the ability to make these displays private, or to share them with other users in your organization.

Making displays public is a powerful feature. As a process engineer you can create a display that you use to hone in on a set of data and then quickly and easily share that display with others across your organization.

You can also send the URL for a shared display in an email or instant message to someone else in your organization for them to see as a public display.

Create a new display

Procedure

1. In the title bar, click the **Create New Display** button .
2. To begin visualizing data select one or more items from the search results and drag them into your display area.

Open a display

There are a few ways to open a display:

Procedure

- Click a display name on the **Homepage**.
- Drag an existing display from either the search results or Cart and drop it onto the title bar of the main workspace.


**Note:**

As you drag an item notice the drop action indicator changes from red to green to signify where you are able to place it in a display.

Name a display

When you create and make changes to a display, PI Coresight automatically saves its contents and customized settings. By default, the display name is named NewDisplayn.

Procedure

1. Click the display name located in the title bar of the display area.  The name becomes an editable field.
2. Enter a new display name. The name is automatically saved along with the display.

Save a display

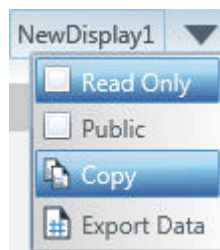
Each time you create a display, PI Coresight automatically saves a copy of it on the server. You can then retrieve the display from the **Homepage** with the same symbols, time range, and custom configuration.

Copy a display

If you have a read only display and would like to create a working version that you have ownership of, simply copy the original display. The original display stays read only, but you can edit the copy.

Procedure

1. In the PI Coresight Workspace click the arrow next to the title that appears in the title bar. A drop down menu appears.



2. Click **Copy**. A new, editable display is created with the word Copy appended to the original display name.

Navigate displays

Displays are automatically saved to the PI Coresight database.

Procedure

- Use your browser's forward and back buttons to move through displays or to return to the **Homepage**.
- Use the Search text box to search for previously saved displays.
- Use display hyperlinks within a display to navigate to other displays.

Undo and Redo



Located in the top left corner of the display area, the **Undo** and **Redo** buttons allow you to undo or redo all actions in a display. Undo and Redo are applicable to symbols added, changed, or deleted; and with regard to changes to the start or end time.

Embed a display in another display

Procedure

- Click and drag a display search result or display Cart item into an existing display. The saved display appears as a thumbnail icon within the open display.



Note:

As you drag an item notice the drop action indicator changes from red to green to signify where you are able to place it in a display.

Reusing and comparing related assets

PI Coresight automatically finds and shows all assets related to the assets in a display. You can swap out these related assets to reuse displays or symbols, or to compare assets.

Related assets are assets that are built on a common template. PI Administrators often create templates for similar assets. For example, when data items for a pump are placed on a display, all related pumps are listed in the Related Assets pane. Since the assets are related, it is easy to switch from one pump to another.


Reuse a display for different assets

You can swap out an asset in the display for a different, related asset. The swap affects all symbols in the display. If related assets are available for one or more assets in the display, then the Related Assets button shows the number of related assets in parentheses

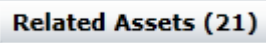
Related Assets (21)

Click that button to see the related assets.


Procedure

1. Click the **Related Assets** button below the Search pane. A list of available assets per location appears.
2. Locate the asset. Click the triangles to expand or collapse asset locations. Hover over the Swap icon  to highlight an asset's associated symbols.
3. Click the asset's Swap icon. This replaces all related assets in all associated symbols in the display.

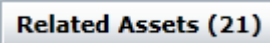
Reuse a symbol for different assets

You can swap out an asset in a symbol for a different, related asset. If related assets are available for one or more of the assets in the display, then the Related Assets button shows the number of related assets in parentheses . Click that button to see the related assets.


Procedure

1. Click the **Related Assets** button below the Search pane. A list of available assets per location appears.
2. Locate the asset. Click the triangles to expand or collapse asset locations. Hover over the Swap icon  to highlight an asset's associated symbols.
3. Drag an asset to a related symbol in the display. If the symbol is a gauge or value, then the asset is immediately replaced. If the symbol is a table or trend, choose **Replace** from the resulting menu. This replaces attributes for current rows or traces with corresponding attributes from the related asset.

Use a table or trend to compare different assets

To compare different assets, you can add attributes from a related asset to corresponding attributes that appear in a trend or table. If related assets are available for one or more of the assets in the display, then the Related Assets button shows the number of related assets in parentheses . Click that button to see the related assets.

Procedure

1. Click the **Related Assets** button below the Search pane. A list of available assets per location appears.
2. Locate the asset. Click the triangles to expand or collapse asset locations. Hover over the Swap icon  to highlight an asset's associated symbols.
3. Drag the asset to a trend or table symbol. Choose **Add** from the resulting menu. This adds new rows or traces for the related assets' attributes. Only the attributes corresponding to the currently displayed attributes are added.

Discovering and analyzing events

Events are important process or business time periods. For example, an event can capture asset downtime, process excursions, operator shifts, or batches. Each event has a name, start time, end time, and associated data items (event attributes).

PI Coresight enables you to view and analyze your PI data during the time range of a particular event. For example, you may want to examine the performance of an asset during an operator shift or compare the data for several assets during a downtime period.


Discover related events

PI Coresight discovers events related to assets on the display. The time range and duration of the display determine what events are shown in the Events list. PI Coresight searches for events from the duration length before the start time of the display to the duration length past the end time of the display. If the time range of an event overlaps this extended time range, the event appears in the Events list. For example, if the duration of the display is one hour, PI Coresight searches for events that occur between one hour before the start time of the display to one hour after the end time of the display.


To discover additional events, enlarge the display time range. To reduce the number of listed events, shorten the display time range.

If the related events are hierarchical and have child events, you can discover the child events by expanding nodes in the Events list.

You can discover related events by adding data items to a display and by adjusting the display time range. The Events list is refreshed whenever you:

- Add or remove data items to the display
- Adjust the timebar controls (this affects the extended time range):
 - Click a different duration for the display time range in the timebar.
 - Drag the display time range scrollbar to the start or end of the extended time range to scroll the extended time range
 - Adjust the thumbwheels for the display time range scrollbar.
- Click the refresh button  at the top of the Events list.

**Note:**

When you lock the list of Events by clicking the  button at the top of the list, the refresh button is disabled. While the Events list is locked, it is no longer automatically updated when you adjust the time range for the display or add data items. After you unlock the Events list, the refresh button is once again enabled and you can click refresh to update the list.

View event information

You can add an event to the display to view its data items as a trend (or other symbol) showing data from the time range of the event. Adding data items from an event to the display sets the display time range to the time range of the event.

Procedure

1. In the Related Events list, find the event data items you want and add them to the display.
 - To add all the event data items, drag the event to the display.
 - To add a data item, click the triangle next to the event name and then the triangle next to Data Items. Locate the data item(s) and drag it to the display.
2. From the popup menu choose the symbol type. In addition to the new symbol (or symbols) on the display, the display time range is set to the start and end times of the event.



Note:

All items on the display, except for locked trends, share the same time range.



Note:

The data item values displayed in a PI Coresight table, or other symbol, reflect the attribute's data reference over the display time range. Therefore, these values might differ from the values displayed in the Related Events list, which are the calculated values as configured in PI AF.

View event attribute values

You can view the configured attribute values for an event without having to drag the event (or its data items) to the display.

Procedure

1. In the Related Events list, find the event data items you want and add them to the display.
2. Click the triangle next to the event name and then the triangle next to **Data Items**. The attribute values are now displayed next to the attribute.



Note:

The data item values in the Related Events list are the calculated values as configured in PI AF. These values might differ from the values shown when you drag the same data item into a PI Coresight table (or other symbol), since these values reflect the attribute's data reference over the time range of the display.

Examples

In the following example, a data item named **Temp.Max** is configured to return the maximum temperature over the event time range in the Related Events list.

When you drag **Temp.Max** onto the PI Coresight table (or other symbol), the data reference for **Temp.Max** is shown in the table and the value reflects the end time of the display. This is the typical behavior in PI Coresight. Similarly, if you drag the data item **Temp.Max** to a trend, PI Coresight produces a trend for the data reference over the display time range.

Analyze data items during the time range of an event

You can apply an event's time range to the entire display, so you can analyze data items on the display during the event time range.

Procedure

1. Include the data items you want to analyze as symbols on the display.
2. In the Related Events list, identify the event with the time range you want to apply. Hovering over an event shows its start and end time in a tooltip.
3. Apply the event's time range to the display.
 - Click the event's clock icon.
 - Drag the event to the display and choose **Apply time range** from the popup menu. The display time range is set to the start and end times of the event.



Note:

All items on the display, except for locked trends, share the same time range.

Analyze a trend during the time range of an event

You can apply an event's time range to a single trend on the display to analyze the trend's data during the event time range.


Procedure

1. Include the trend you want to analyze on the display.
2. In the Related Events list, identify the event with the time range you want to apply. Hovering over an event shows its start and end time in a tooltip.
3. Click the triangle next to the event name to locate Time Range and drag that to the trend in the display. The trend is now locked to the event time range. The display time range is not affected.

Lock the Events list during analysis

To keep your selected list of events accessible while you perform analysis, you can lock the list of Events. When the list is locked, if you apply the time frames of different events in the list to your display, the list of events is no longer automatically updated.

To lock the Events list:

1. Click the  button at the top of the list.
2. Drag the time range of the event you are analyzing onto the display or click the clock next to an event.

Your display now reflects the time range of that event, but the Events list remains unchanged.



Note:

The refresh button is disabled while the list is locked. After you unlock the Events list, click refresh to update the list.

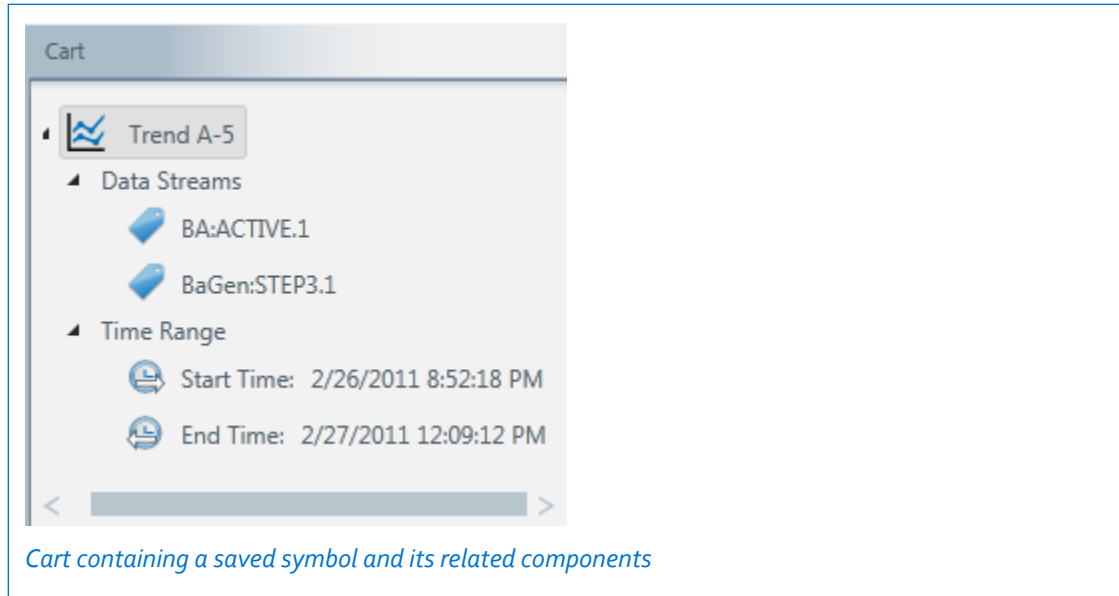
Compare multiple events with locked trends

You can lock the time range for a trend to an event's time range without affecting the rest of the display. By creating multiple trends locked to different events, you can compare data items at different time ranges. You can, for example, create more than one trend using the same data items to analyze those data items at different time ranges.

Procedure

1. In Related Events, identify the events whose time ranges you want to use for your comparison. Hovering over an event shows its start and end times in a tooltip.
2. Place data items you want to compare on the display as trends. Be sure to create a separate trend for each time range in your comparison.
3. Lock each trend to the time range of an event. Click the triangle next to an event name to locate its Time Range, and drag that to the trend in the display. The trend is now locked to the event time range. The display time range is not affected.

Cart



The Cart allows you to save individual symbols from a display and reuse them or their components in other symbols or displays. The symbols in your Cart can be used in your own workspace. You can save links to entire displays in your Cart.

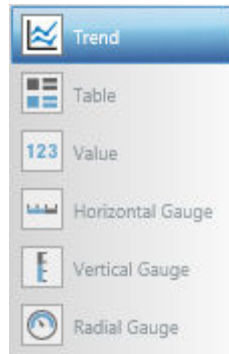
The Cart is located in the lower left pane of the workspace. It lists symbols with their corresponding icon, and breaks these symbols down into their component parts: data item, start time, and end time. Items saved to the Cart persist in the Cart even after you change displays or shut down your computer.

You cannot add items directly from the Search results to the Cart. Instead you must first add items to the current display and drag from there into the Cart. Any symbol or display link can be dragged into the Cart. Once added, the Cart separates the symbol's components and allows you to drag and drop these components into other symbols.

Add a symbol to the Cart


Procedure

1. Move the mouse pointer over the symbol you want to add to the Cart. The symbol's control bar appears at the top.
2. Click the symbol's control area and drag it into the Cart. A hierarchical list appears that displays the symbol name and its associated data items and time range. Symbols use the following icons:



Add a display to the Cart

Procedure

1. Use the **Search** text box to find a previously saved display.
2. Drag the display name from the search results onto a display. The previously saved display is represented as a thumbnail on the current display.
3. Move your mouse pointer over the display thumbnail. The display's control bar appears at the top.
4. Click the drag area  on the control bar and drag the thumbnail into the Cart.



Note:

As you drag an item notice the drop action indicator changes from red to green to signify where you are able to place it in a display.

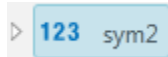
Reuse Cart items in a display

Procedure

- Click any item in the Cart and drag it onto the current display.
 - If you drop a symbol or symbol component onto another symbol that symbol is updated with the values you dragged over from the Cart.
 - If you drop a data item from the Cart onto a blank area of the display the symbol drop-down list appears allowing you to create a new symbol with the Cart item.
 - If you drop a time range or start or end time onto a display, the display uses the dropped time.
 - If you drop a display from the Cart into the current display it appears as a hyperlinked thumbnail.

Change the name of a symbol in the Cart

By default, when you add a symbol to the Cart the symbol is given a generic name like sym2.



Procedure

1. Double-click on the symbol name field in the Cart. A black box surrounds the name indicating it is ready to edit.
2. Enter a new name.

About saving Cart entries

The Cart is automatically saved so that your symbol components persist in the Cart whenever you restart the application.

Delete Cart items

Procedure

- To delete a symbol or display from the Cart click the item and press DELETE.
You cannot delete individual data items or time ranges from items in the Cart.

Additional topics

PI Application Server Administration

The PI Application Server Administration site is where you configure the database to use with PI Coresight. The site also lets you view and manage the PI Systems you connect to with PI Coresight, and see version information for installed PI Coresight components.

The administration site is located: `http://<server name>/Admin`

PI Coresight ships with a separate administration guide that includes details on installation, configuration, administration, and event logging. See the *PI Coresight Administration Guide* for more details.

Data exported from a display

You can export data from a display to an XML file, which can be imported into a spreadsheet application such as Microsoft Excel for further analysis.


The imported workbook includes these worksheets:

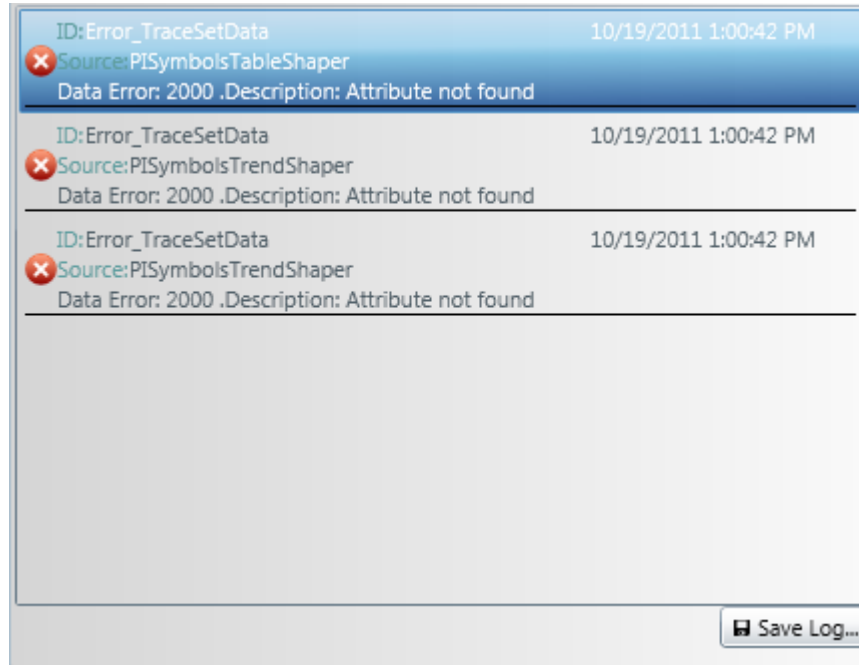
- A display worksheet. This lists interval data for the data items in the current display.
- A worksheet for every locked trend, providing interval data for each data item in the locked trend's time range.
- An Archive data worksheet. This lists archive data for all data items in the display.

Save an error log

PI Coresight has a built-in error logging feature that offers debugging information directly inside the application.

Procedure

1. In the menu bar of the current display, click the **Error Log** button . The button automatically displays the number of errors that have accumulated. If it shows 0 errors, there are no errors.
2. An error log window appears that lists all errors. Click the **Save Log** button at the bottom to save the log to an external file.



Bookmarks

Use your web browser's bookmark or favorites to bookmark the **Homepage** or any display page in PI Coresight. PI Coresight gives each display a unique ID, which allows you to save a display page's URL in your favorites, or to copy and paste to another location for future retrieval.



Note:

If you bookmark a display and later change its name, the bookmark keeps the original display name. However, since the unique ID does not change, the bookmark still opens the display.

Multilingual support

PI Coresight includes a Multilingual User Interface (MUI) that allows you to view the application in eight different languages on a single system. The languages include:

- French
- German
- Spanish
- Portuguese
- Simplified Chinese
- Japanese
- Korean
- Russian

The PI Coresight MUI is available for download from the [OSIsoft Technical Support Download Center](#). Once the MUI is installed, you can change the language used by PI Coresight by modifying the language settings in your Web browser.

Technical support and other resources

For technical assistance, contact OSIssoft Technical Support at +1 510-297-5828 or <http://techsupport.osisoft.com>. The OSIssoft Technical Support website offers additional contact options for customers outside of the United States.

When you contact OSIssoft Technical Support, be prepared to provide this information:

- Product name, version, and build numbers
- Details about your computer platform (CPU type, operating system, and version number)
- Time that the difficulty started
- Log files at that time
- Details of any environment changes prior to the start of the issue
- Summary of the issue, including any relevant log files during the time the issue occurred

The [OSIssoft Virtual Campus \(vCampus\) website](http://vcampus.osisoft.com) (<http://vcampus.osisoft.com>) has subscription-based resources to help you with the programming and integration of OSIssoft products.

