



XHQ

Trend Viewer User's Guide

About This Guide

Getting Started

1

Exploring the Trend Viewer Interface

2

Using the XHQ Trend Viewer

3




Analyzing Trend Data

4

Legal information

Warning notice system

This manual contains notices you have to observe in order to ensure your personal safety, as well as to prevent damage to property. The notices referring to your personal safety are highlighted in the manual by a safety alert symbol, notices referring only to property damage have no safety alert symbol. These notices shown below are graded according to the degree of danger.

 DANGER
Indicates that death or severe personal injury will result if proper precautions are not taken.
 WARNING
Indicates that death or severe personal injury may result if proper precautions are not taken.
 CAUTION
Indicates that minor personal injury can result if proper precautions are not taken.
NOTICE
Indicates that property damage can result if proper precautions are not taken.


If more than one degree of danger is present, the warning notice representing the highest degree of danger will be used. A notice warning of injury to persons with a safety alert symbol may also include a warning relating to property damage. See the topic, [Visual Cues for Online Viewing](#), for additional XHQ-specific notices.

Qualified Personnel

The product/system described in this documentation may be operated only by personnel qualified for the specific task in accordance with the relevant documentation, in particular its warning notices and safety instructions. Qualified personnel are those who, based on their training and experience, are capable of identifying risks and avoiding potential hazards when working with these products/systems.

Proper use of Siemens products

Note the following:

 WARNING
Siemens products may only be used for the applications described in the catalog and in the relevant technical documentation. If products and components from other manufacturers are used, these must be recommended or approved by Siemens. Proper transport, storage, installation, assembly, commissioning, operation and maintenance are required to ensure that the products operate safely and without any problems. The permissible ambient conditions must be complied with. The information in the relevant documentation must be observed.

Trademarks

All names identified by ® are registered trademarks of Siemens AG. The remaining trademarks in this publication may be trademarks whose use by third parties for their own purposes could violate the rights of the owner. For a complete list, see the [Copyright](#) topic.

Disclaimer of Liability

We have reviewed the contents of this publication to ensure consistency with the hardware and software described. Since variance cannot be precluded entirely, we cannot guarantee full consistency. However, the information in this publication is reviewed regularly and any necessary corrections are included in subsequent editions.

Copyright © 1998-2020 Siemens AG. All rights reserved. Protected by U.S. Patents Nos. 6,700,590, 7,069,514, 7,478,128, 7,689,579, 7,698,292, 7,814,123, 7,840,607, 8,001,332, 8,078,598, 8,260,783, 8,442,938, 8,566,781, 8,700,671 and 8,700,559; Patents Pending.

Siemens Industry Software Inc.
6 Journey, Suite 200
Aliso Viejo, CA 92656-5318, USA
siemens.com/xhq

XHQ® is a registered trademark of Siemens AG in the United States. This License does not grant LICENSEE any rights to trademarks or service marks of Siemens AG.

All other company, product and service names and logos may be trademarks or service marks of their respective companies. Any rights not expressly granted herein are reserved. LICENSEE may not remove or alter any trademark, logo, copyright or other proprietary notices, legends, symbols or labels from the Licensed Software or the Documentation.

This software is proprietary and confidential. Siemens AG or its suppliers own the title, copyright, and other intellectual property rights in the Software. The Software is licensed, not sold.

Adobe, the Adobe logo, Acrobat, the Adobe PDF logo, PostScript, and the PostScript logo, Distiller, and Reader are either registered trademarks or trademarks of Adobe Systems Incorporated in the United States and/or other countries.

Microsoft, Active Directory, ActiveX, Authenticode, Developer Studio, DirectX, Microsoft, MS-DOS, Outlook, Excel, PowerPoint, Visual Basic, Visual C++, Visual C#, Visual J#, Visual SourceSafe, Visual Studio, Win32, Windows, Windows Server, WinFX, Windows 7, Windows 10, Windows Server 2012, Windows Server 2016, Windows Server 2019, and the Windows logo are either registered trademarks or trademarks of Microsoft Corporation in the United States and/or other countries, or both.

HTML, XML, XHTML and W3C are trademarks or registered trademarks of W3C®, World Wide Web Consortium, Massachusetts Institute of Technology.

IT Infrastructure Library is a registered trademark of the Central Computer and Telecommunications Agency which is now part of the Office of Government Commerce.

Intel, Intel logo, Intel Inside, Intel Inside logo, Intel Centrino, Intel Centrino logo, Celeron, Intel Xeon, Intel SpeedStep, Itanium, and Pentium are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries.

Oracle, Java, and all Java-based trademarks and logos are trademarks or registered trademarks of Oracle and/or its affiliates. Oracle, or its licensor, shall at all times retain all rights, title, interest, including intellectual property rights, in Oracle Programs and media.

SAP, SAP R/3, R/3, R/3 software, mySAP, mySAP.com, xApps, xApp, ABAP, BAPI, and SAP NetWeaver are trademarks or registered trademarks of SAP AG in Germany and in several other countries.

Documentum, OpenText Documentum, OpenText and the Corporate Logo are trademarks or registered trademarks of OpenText in the United States and throughout the world.

IBM, the IBM logo, DB2, and ibm.com are trademarks of International Business Machines Corp., registered in many jurisdictions worldwide.

InstallShield® is a registered trademark and service mark of Macrovision Corporation and/or Macrovision Europe Ltd. in the United States and/or other countries. DemoShield, InstallFromTheWeb and PackageForTheWeb are service marks and registered trademarks of Macrovision Corporation and/or Macrovision Europe Ltd. in the United States and/or other countries. InstallShield Express, InstallShield for Windows Installer, InstallShield for Windows CE, Express Wizard, InstallShield Objects, WebUpdate, FastReg and NetInstall are trademarks and/or service marks of Macrovision Corporation and/or Macrovision Europe Ltd. InstallShield Software Corporation. InstallShield is a member of Macrovision Corporation.

Siemens provides products and solutions with industrial security functions that support the secure operation of plants, systems, machines and networks.

In order to protect plants, systems, machines and networks against cyber threats, it is necessary to implement – and continuously maintain – a holistic, state-of-the-art industrial security concept. Siemens' products and solutions only form one element of such a concept.

Customer is responsible to prevent unauthorized access to its plants, systems, machines and networks. Systems, machines and components should only be connected to the enterprise network or the internet if and to the extent necessary and with appropriate security measures (e.g. use of firewalls and network segmentation) in place.

Additionally, Siemens' guidance on appropriate security measures should be taken into account. For more information about industrial security, please visit <https://www.siemens.com/industrialsecurity>.

Siemens' products and solutions undergo continuous development to make them more secure. Siemens strongly recommends to apply product updates as soon as available and to always use the latest product versions. Use of product versions that are no longer supported, and failure to apply latest updates may increase customer's exposure to cyber threats.

For the Siemens Security Advisory, visit <https://www.siemens.com/industrialsecurity>.

To stay informed about product updates, subscribe to the Siemens Industrial Security RSS Feed under <https://www.siemens.com/industrialsecurity>.

While every effort is made to ensure the accuracy of content, the XHQ product documentation set (which includes online help) could contain inaccuracies or out-dated material (which includes product screenshots and images) due to the large number of product enhancements being added. As such, the documentation set is subject to change at any time without notice. Refer to the README for documentation corrections and addendum. Please note, updates to the documentation set are reflected in the next general availability major release of XHQ.

Table of Contents

About This Guide	7
Conventions Used in This Guide	7
Visual Cues for Online Viewing	8
Related XHQ Product Documentation	9
Contacting Customer Support	11
General Feedback and Comments	12
1 Getting Started	13
Launching the XHQ Trend Viewer	13
From the XHQ Solution Builder	15
To verify an item's connection and history	15
To select a value item and launch the XHQ Trend Viewer	15
From the XHQ Solution Viewer	16
To access a trend from the XHQ Navigation Bar	16
2 Exploring the XHQ Trend Viewer Interface	17
The Menu Bar	18
The Trend Chart	20
The Control Panel	21
The Legend Panel	23
3 Using the XHQ Trend Viewer	26
Using the Menu Bar	27
Displaying the Trend in Time or XY Mode	28
Refreshing the Trend	28
About the Value List	28
To edit selected values (pens)	29
Adjusting Time Parameters	30
Panning or Zooming on a Chart	31
Using Scooters	32
To use the scooter to pinpoint displayed values	32
About Multiple Scooters	33
Viewing Line Traces	35
To render a trace visible or invisible	35
Showing a Line Trace in Symbol Form	36
To view the line trace(s) in symbol mode	36
Adding a Line Trace to the XHQ Trend Viewer	36
Line Trace Naming Convention	36

To add a variable (and line trace) to the XHQ Trend Viewer	36
To delete a variable (and line trace) from the XHQ Trend Viewer	37
Setting the Scale (Y-axis)	37
About Single Scale	37
About All Scales	37
Setting Min and Max Values	38
To manually adjust the min and max values	38
About the Logarithmic Trend Scale	38
Using Dual Scale	39
Working with Aggregate Trends	40
About the Aggregate Interval	40
About the History Retrieval Types	40
Using Curve Fits	42
About Linear Curve Fits	43
About Simple Average Curve Fits	43
Accessing Curve Fits Statistics	43
To plot a curve fit	43
To access curve fit statistics	44
Using Expressions in the XHQ Interactive Trender	45
Expressions Containing More than One Reference	45
Accessing the Trend Applet URL	46
About the Trend Applet URL	46
Printing the Trend Chart	53
To print a chart	53
Saving the Trend Chart	53
To save the chart	53
Setting Trend Chart Properties	54
To set trend chart options	56
E-mailing the Trend Chart URL	57
To e-mail the chart URL	57
4 Analyzing Trend Data	58
Using the XHQ Trend Table	58
To launch a trend table from the shortcut menu	59
About the XHQ Trend Table URL	59
XHQ Trend Table Interface	61
Using Excel to View Trend Data	63
To launch Excel to view trend data	64

About This Guide

Conventions Used in This Guide

The following formatting cues are designed to allow you to quickly locate and understand the information provided in this guide.

Formatting Conventions

Convention	Example
Acronyms are spelled out the first time they appear.	Alert Notification System (ANS)
Bold is used for menu names, command options, and dialog box names in primary task procedures.	From the XHQ Workbench , go to the Add menu and click New Component .
<i>Italic</i> is used for glossary terms.	The first step in building this model is to develop reusable software building blocks, called <i>components</i> .
A monospaced font is used for program and code examples.	The subdirectory <code>\log</code> is automatically created below the location you choose. All log files are written to this subdirectory. <code>C:\XHQ</code>
Key combinations appear in uppercase, bold. If joined with a plus sign (+), press and hold the first key while you press the remaining keys.	CTRL+B
In See Also notices, sub-chapter headings are in italics, chapter headings are in quotes, and guide titles are in bold.	For more information, go to the <i>About install.properties</i> topic located in the "Working with PROPERTIES Files" chapter of the XHQ Administrator's Guide .

Visual Cues for Online Viewing

This document uses the following styled paragraphs.

Important notices provide information that are required to completing a given task.



XHQ must run as a domain user.

Warnings tell you that failure to take or avoid a certain action could result in loss of data or application malfunction.



WARNING

Do not modify the `shutdown.dat` template file.

Notes are used to offer information that supplement important points of the main text. Tips suggest certain techniques and procedures that may help you achieve your task quickly.



Depending on your network configuration, include domain information only if the domains are different.

See Also notices provide you with additional references to similar topics and/or concepts within the documentation set. Sub-chapter headings are in italics, chapter headings are in quotes, and guide titles are in bold.



For more information, go to the About the Options Menu topic located in the "Working with PROPERTIES Files" chapter of the **XHQ Administrator's Guide**.

Tips provide additional hints to help you use the product more efficiently.



Use the `NavbarWestVerticalOffset` property to make fine adjustments in pixels. The upper, left-hand corner is the origin. The positive horizontal direction moves to the right and the positive vertical direction moves down.

Web References point you to external web sites that give additional information on the given topic.



Refer to Microsoft support information with regards to the various server settings for application performance and network utilization.

<http://support.microsoft.com>

Related XHQ Product Documentation

The XHQ documentation set includes the following titles.

XHQ Documentation Set

Title	Target Audience
XHQ Administrator's Guide Provides the steps required to begin administering XHQ. It also covers security and access, property settings, redundancy, and localization.	Administrators
XHQ ANS User's Guide Learn how to use and administer the XHQ Alert Notification System (XHQ ANS).	ANS Users, Administrators
XHQ Backup and Recovery Guide Learn how to properly backup XHQ.	Administrators
XHQ Connection Guide Provides information on injecting an XHQ-supported connector type and configuring the connection.	Connector Developers
XHQ Developer's Guide Introduces the XHQ Development Client (Workbench and Solution Builder) user interface and provides information on how to set-up XHQ, develop reusable components, create views, and build a solution hierarchy.	Content and Solution Developers
XHQ Getting Started Gives you step-by-step instruction on how to set up your model and solution.	Content, Connector, and Solution Developers
XHQ Installation Guide Provides the system requirements, installation instructions, and upgrade information for the current release of the XHQ System.	Administrators
XHQ Integrated Data Gateway Guide Includes information on the ADO.NET and the XHQ OPC UA Server.	Application Engineers, Integrators
XHQ Performance Analytics Guide Learn how to use the Engineering Environment to enable the generation of the processes necessary to extract and transform data for source systems, and populate the XHQ Data Store and Data Mart.	Solution Developers/Users, Analysts
XHQ Performance Management Guide Learn how to use Target Management to monitor performance indicators and eLogs to create shift reports.	Administrators, End Users
XHQ Reference Guide Lists the functions and methods used in XHQ, and provides examples,	Content and Solution Developers

Title	Target Audience
usage notes, and parameter descriptions.	
XHQ Reporting Services Guide Introduces the XHQ Reporting Services and provides instruction on how to connect to an XHQ data source.	Application Engineers, End Users
XHQ SDK Reference Guide Provides a set of development tools that allows you to create applications that extend XHQ. Includes information on the Client API and Web Services.	Application Engineers, Integrators
XHQ Solution Design and Architecture Provides best-practice examples for XHQ solution design. Includes information on tag synchronization.	Solution Architects
XHQ Solution Viewer User's Guide Gives you step-by-step instruction on how to access your solution through a browser client and set browser preferences.	All End Users
XHQ System Guide Contains information regarding secure handling of an XHQ implementation.	Administrators, Application Engineers, Integrators
XHQ Trend Viewer User's Guide Learn how to use the XHQ Trend Viewer to view both real-time and historical data.	All End Users

Contacting Customer Support

XHQ Customer Support is a second-level customer support offering, that is, it does not provide XHQ end users with direct support. XHQ end users are to contact their local company help desk or internal application support staff and, in turn, those representatives contact the XHQ Customer Support Team. These representatives are expected to have attended basic product administrative training or possess comparable skills with XHQ, and know and support the specific XHQ customer solution in use.

If the details or response times noted below deviate from those specified in a specific customer contract, the customer contract always takes precedence.

For general XHQ product support or related questions, pre-registered customer or partner support staff with a valid XHQ customer support agreement may contact the XHQ Customer Support Team using any of the following means:

Web Portal

The support portal leverages a system called GTAC (Global Technical Access Center). GTAC provides one common support entry point for many Siemens products. It is available via this URL:

<https://www.siemens.com/gtac>

Customers must be pre-registered to be able to use the web portal. A log-in can be requested at any time by self-registering in the GTAC portal. Note, the end-user "sold to" identifier is needed in order to register.

Use of the support portal is the preferred means to report incidents to the XHQ Customer Support Team unless immediate interactive telephone assistance is required. The support portal is available twenty four hours per day/seven days per week ("24/7").

E-mail

support.xhq@siemens.com

Phone Support and Hours of Coverage

International: +1 (949) 448-7463

U.S. only: +1 (877) 700-4639

The following paid support levels are available:

Bronze Support: 9/5

9 x 5 hours support. 9 hours per day, 5 days per week, Monday to Friday. Daylight Saving Time is honored.

Choice of one coverage zone out of the following options (the default is Americas):

- Americas (7 am - 6 pm PST; 11 hours coverage due to PST/CST/EST time zone coverage overlap)
- South Central Asia (9:30 am - 6 pm IST; 9 hours coverage)

Excludes national holidays as defined by the following countries for the related coverage zone:

- USA/California (Americas)
- India/Pune (South Central Asia)

Example Americas zone: *Implies coverage from 7:00 AM to 6:00 PM, Pacific Time, Monday to Friday, excluding US national holidays.*

Silver Support

Ability to leverage both support coverage zones **Americas** and **South Central Asia** as defined in Bronze for extended daily coverage hours.

The weekly start/end times of coverage follow the local times of the following coverage zone:

- California/USA (Americas)

This implies weekday coverage from 7 am until 6 pm Pacific Time, Monday to Friday, as in the Americas support coverage zone but with the ability to additionally leverage the South-central Asia coverage zone for additional coverage hours.

Gold Support: 24/7

Silver Support coverage plus 24 hours per day, 7 days per week emergency support for Severity One incidents.

Postal Mail

Siemens Industry Software Inc.

XHQ Operations Intelligence

Attn: XHQ Customer Support Department

6 Journey, Suite 200

Aliso Viejo, CA 92656, USA

General Feedback and Comments

Please send an e-mail to:

info.xhq@siemens.com

Siemens Industry Software Inc. and affiliated Siemens Industry Software companies (collectively referred to as "SISW") are committed to working with our customers. Your comments, suggestions, and ideas for improvements are very important to us. Thank you for taking the time to send us your feedback.

1 | Getting Started

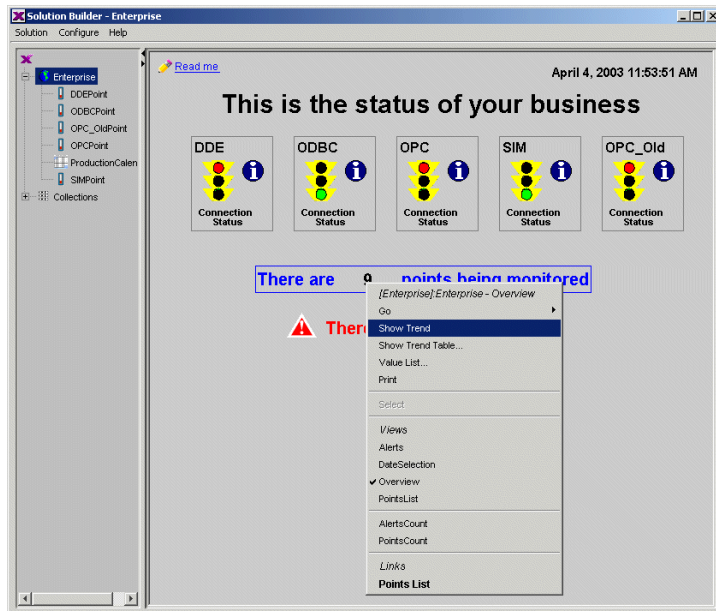
With the XHQ Trend Viewer, you can view both *real-time* and *historical* data. Real-time trending is dynamic, plotting changes as they occur for the specified variable (pen). Historical trending, on the other hand, is static and provides a snapshot of data from a particular time and date in the past. The XHQ Trend Viewer can retrieve data from the XHQ Historian or any Siemens-supported historian.

Launching the XHQ Trend Viewer

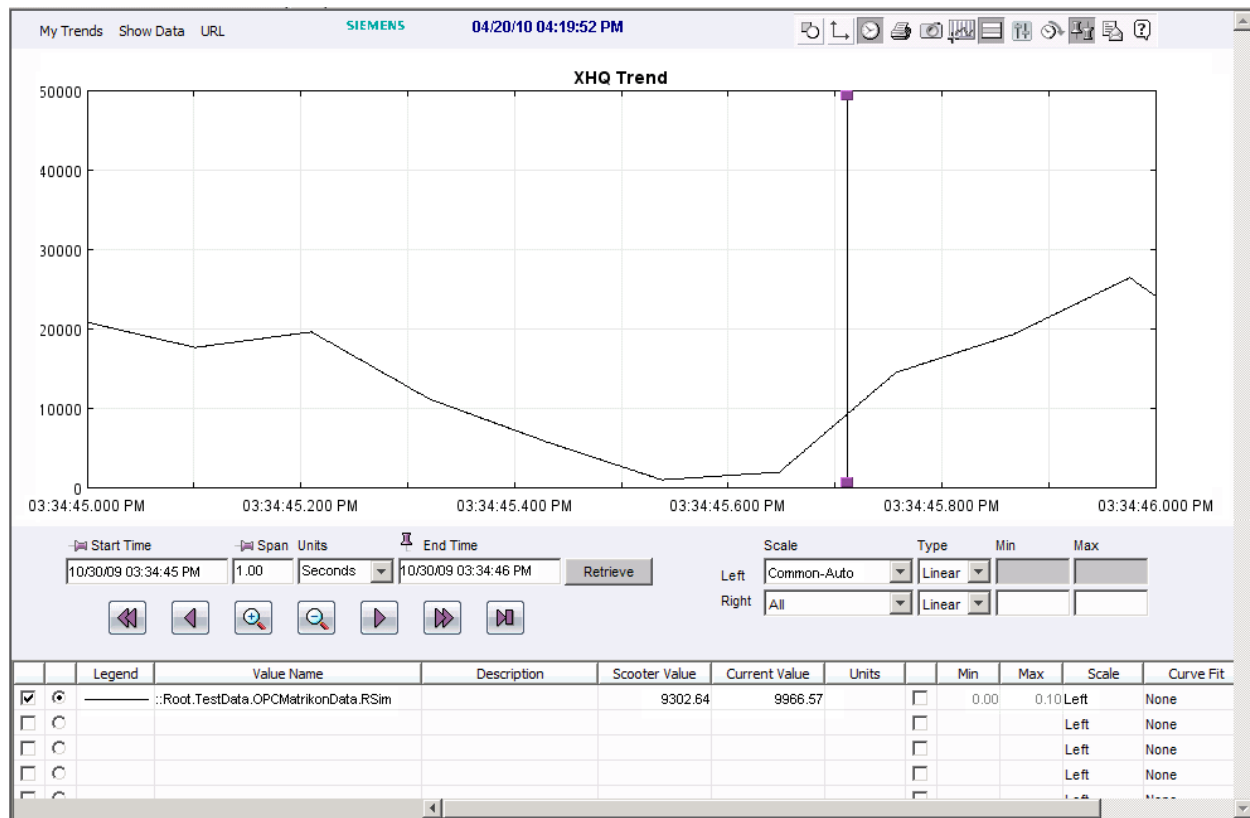
To launch the XHQ Trend Viewer from the XHQ Solution Builder (XHQ Development Client) or the XHQ Solution Viewer (XHQ browser client), you can either select a value to trend or click on an embedded trend.



The XHQ Trend Viewer does not trend BAD data, only GOOD or UNCERTAIN data.



Launching the XHQ Trend Viewer from the XHQ Solution Builder



XHQ Trend Viewer (or XHQ Interactive Trender)



Each time you select Show Trend from the right-click shortcut menu, you invoke another instance of the XHQ Trend Viewer. This can result in several open instances of the XHQ Trend Viewer. And the XHQ Trend Viewer remains open unless it is explicitly closed.

From the XHQ Solution Builder



In order to launch the XHQ Trend Viewer from the XHQ Solution Builder, you must have WRITE access to the %XHQ_DEV_REPOS%\temp folder. In addition, the global property **webserver** must be defined for the given web server.

For more information on global properties, go to the topic, [Working with .PROPERTIES Files](#), located in the XHQ Administrator's Guide.

Before launching the XHQ Trend Viewer from the XHQ Solution Builder, you must verify that the item's **connection** and **history** are configured properly. This is done through the Details view of the XHQ Solution Builder.

To verify an item's connection and history

1. From the **Navigation panel** of the XHQ Solution Builder, navigate to and select the component. The Detail view for that component appears.
2. From the **Inventory Items** panel, click the **item**. The Detail view tabs appear.
3. Click the **Connect tab**.
4. Verify the **Connection Group**.
5. Click the **History tab**.
6. Verify the **Historian**.
7. If changes were made, click **Save Configuration**.
8. **Repeat** steps 1 through 7 for each item.

Your next step is to select each value item to view and launch the XHQ Trend Viewer.

To select a value item and launch the XHQ Trend Viewer

1. Using the **Navigation panel** of the XHQ Solution Builder, **open the view** that contains the value item.
2. **Point the mouse** cursor directly on the value item (where the values are updating) and **right-click**. The right-click shortcut menu appears.
3. From the shortcut menu, click **Select**. This adds the value item to the trend list. Once you have selected a value item, the commands "Show Trend," "Show Trend Table", and "Value List" become available.
4. **Repeat** steps 1 through 3 for each value item to trend. You can add up to sixteen values to view in the XHQ Trend Viewer simultaneously.



If you add more than sixteen values, the "oldest" (the first one selected) is omitted to make room for the "newest" (the most recently added).

5. Point to a value item you selected, right-click, and then click **Show Trend**. The XHQ Trend Viewer appears.

From the XHQ Solution Viewer

There are two ways to access the XHQ Trend Viewer from the XHQ Solution Viewer: from the Navigation panel or from the XHQ Navigation Bar (or XHQ NavBar).



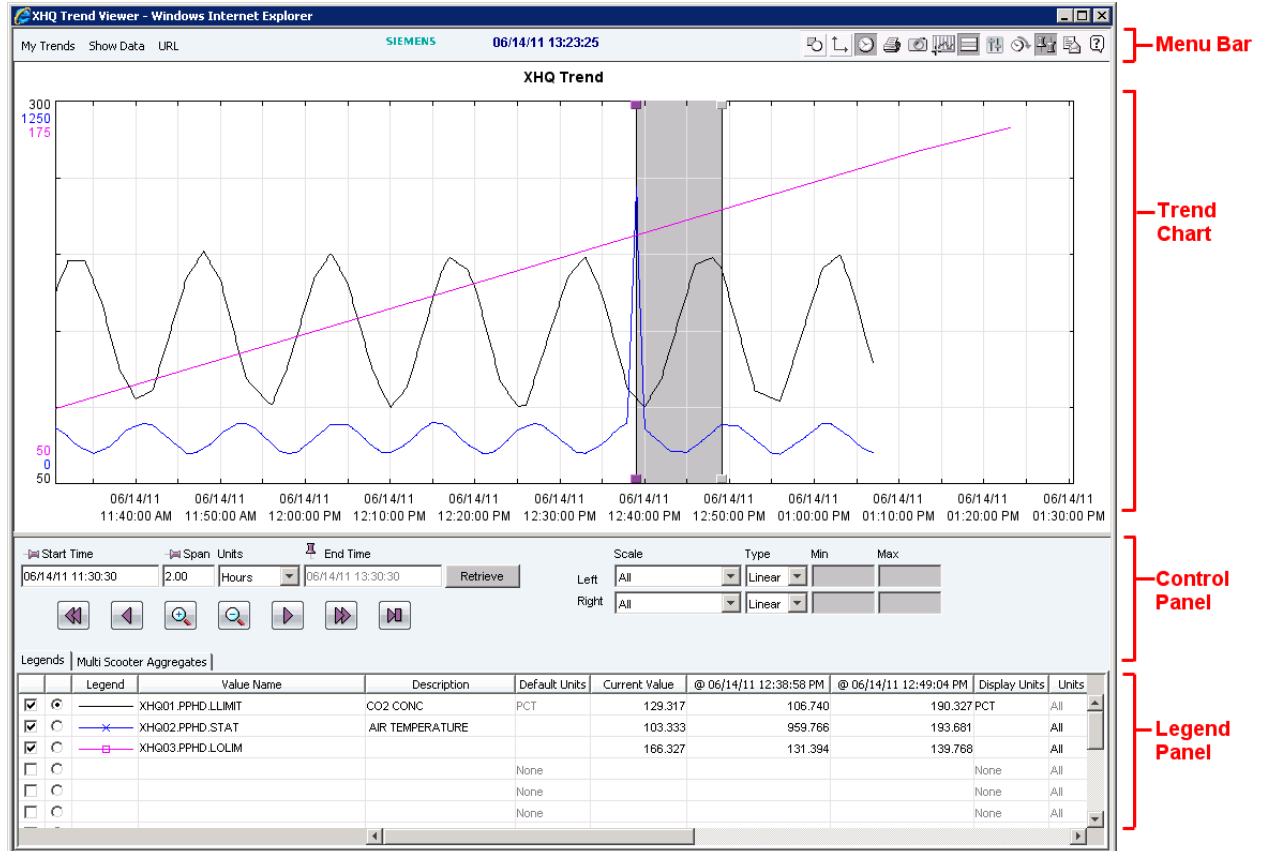
For more information on the XHQ Navigation Bar, see the topic, *The XHQ Navigation Bar*, located in the XHQ Solution Viewer User's Guide.

To access a trend from the XHQ Navigation Bar

1. Launch your solution with the **XHQ Navigation Bar** enabled.
2. From the XHQ Navigation Bar, select the trend from the **My Trends** list.
This launches the XHQ Trend Viewer (also known as the XHQ Interactive Trender).

2 | Exploring the XHQ Trend Viewer Interface

Sometimes referred to as the **XHQ Interactive Trender** or **Interactive Popup**, the XHQ Trend Viewer consists of three primary panels. This section takes an in-depth look at the XHQ Trend Viewer interface, giving you a good understanding of how the three panels function.













XHQ Trend Viewer Panels

The Menu Bar

The Menu Bar allows you to quickly activate commonly used actions, such as My Trends, Show Data, and Print.

Menu Bar Items

Icon	Item	Description
	My Trends	A list of trends saved as favorites.
	Show Data	<p>Select and launch the following applications for trend data analysis:</p> <ul style="list-style-type: none"> • XHQ Trend Table • Excel • Statistics (This displays the Curve Fits statistics for each pen with a <i>Linear</i> curve fit. The Correlation Coefficient value is given for each pen selected.)
	URL	<p>Access the URL for the current trend applet:</p> <ul style="list-style-type: none"> • Show URL A window appears, displaying the trend applet URL. • Copy URL to clipboard This copies the URL of the current trend configuration onto the clipboard. To access it, open a text editor and paste. • Go to URL This opens the URL in the same browser instance. The trend applet URL is then displayed in the address bar.
	<Logo>	<p>Similar to the NavBar Logo.</p> <p>For more information on the XHQ Navigation Bar, see the topic, <i>The XHQ Navigation Bar</i>, located in the XHQ Solution Viewer User's Guide.</p>
	Date and Time	<p>Similar to the NavBar clock. It displays the current time in a given date/time format.</p> <p>For more information on the XHQ Navigation Bar, see the topic, <i>The XHQ Navigation Bar</i>, located in the XHQ Solution Viewer User's Guide.</p>
	Toggle trend symbols	Show or hide the assigned pen symbols on the Trend Chart.
	XY Plot	Displays the XY plot.
	Time Plot	Displays the time plot
	Print	Prints the Trend.
	Save	Saves both Trend Chart and relevant data as a print-ready html file.
	Add trend to My Trends	Allows you to save a trend under My Trends in either relative or absolute times.

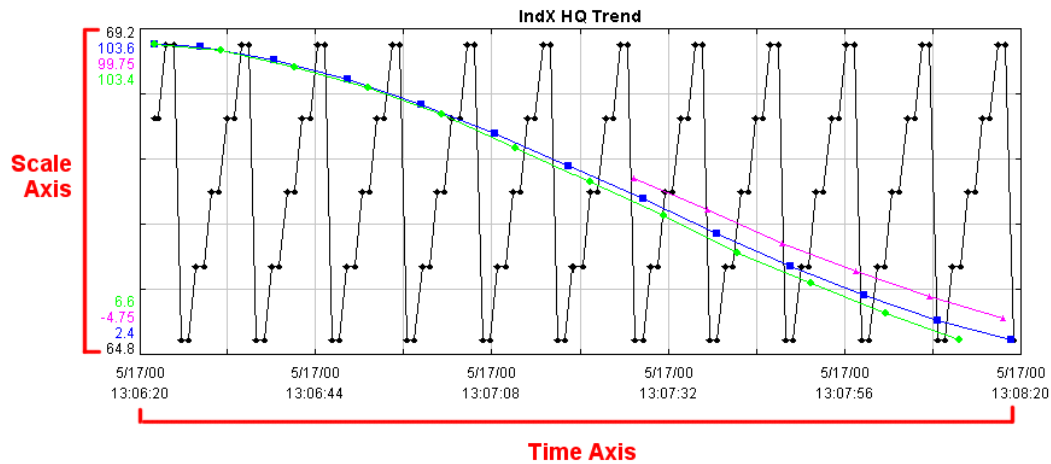
Icon	Item	Description
	Hide/show Control Panel	Collapse (hide) or display the Control Panel.
	Trend Options	Edit certain trend chart properties.
	Send Mail	Allows you to e-mail a trend URL.
	Help	Launches the XHQ Solution Viewer WebHelp in a separate browser.

The Trend Chart

The grid is called the Trend Chart. The Trend Chart displays up to sixteen *line traces* (pens). Line traces are curvilinear representations of how a variable changes over time.

In the vertical, y-axis direction (also known as the **Scale** axis), the grid spacing is always set to 5 intervals. In the horizontal, x-axis direction (the **Time** axis), the number of grid intervals is automatically determined, depending on the following factors:

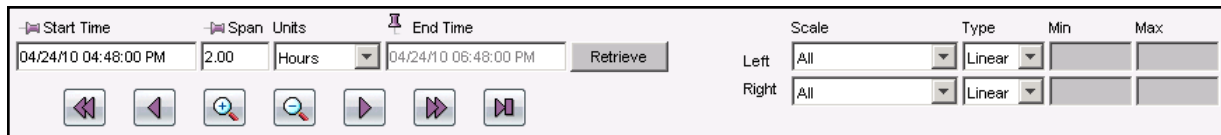
- Trend size
- Date/time format (which affects the label length)
- Trend duration



There are different ways to display the Scale and Time axis labels, which is discussed in the topic, [Setting the Scale Y axis](#).

The Control Panel

In the middle of the XHQ Trend Viewer is the Control Panel. The Control Panel contains VCR-type buttons, which allow you to pan backwards or forwards, or zoom in or out. It also displays the Start Time, End Time, Span, and Scooter Time. From it you can set the Scale display or Aggregate Interval. These are just a few of the things you can do from the Control Panel.










Control Panel



For an embedded trend, trend properties and pen attributes can be pre-configured during design time. In runtime, when you launch the XHQ Trend Viewer from the embedded trend, the properties you set are automatically applied.

Control Panel Items

Item	Description
Start Time	Displays the start date and time.
Span	Sets the time span to view the trend.
Units	Defines the units in weeks, days, hours, minutes, or seconds.
End Time	Displays the end date and time.
Retrieve	Sets the time scale (x-axis) to reflect the start, span, and end time values. The appropriate data is retrieved and displayed.
	This is a left pan button that shifts the displayed trend back in time by an amount equal to the selected span .
	This is a left pan button that shifts the displayed trend back in time by an amount equal to one-half of the selected span .
	This is a zoom in button that decreases (by a half for each click) the span of time over which the trend is displayed.
	This is a zoom out button that increases (doubles for each click) the span of time over which the trend is displayed.
	This is a right pan button that shifts the displayed trend forward in time by an amount equal to one-half of the selected span .
	This is a right pan button that shifts the displayed trend forward in time by an amount equal to the selected span .
	This is a scroll to the end button that moves the span to adjust the display to show the current time at the right side of the trace.
Scale	Enables you to view the Y-scale values. You can set the Y-scale for both the Left and Right.

Item	Description
	<ul style="list-style-type: none"> • All Enables you to view the Y-scale values for all traces (All). • Single Enables you to view the Y-scale value for a single trace. • Common-Auto Automatically sets a common max and min value for all pens displayed. • Common-Manual Enables you to set a common max and min value for all pens displayed.
Type	<p>Displays the scale in:</p> <ul style="list-style-type: none"> • Linear This is the default. • Log10 Common logarithm of base-10. • Log Natural logarithm of base-e. <p>Note: The <i>logarithm</i> of a given number is the power to which the base is raised to yield the given number.</p> <p>So, $\log_{\text{base}} n = x$ if $b^x = n$</p> <p>Where n is the given number; b is the base; and x is the power.</p> <p>Also, $(\text{base})^{\log(n)} = n$</p>
Min	This displays the minimum y-scale value.
Max	This displays the maximum y-scale value.


The Legend Panel

The Legend Panel is where you can add, delete, and render visible or invisible the Trend Charts displayed in the XHQ Trend Viewer. You also use the Legend Panel to set Minimum and Maximum values for each trace in the Trend Chart. The Legend Panel consists of the Legends tab and the Multi Scooter Aggregates tab.



For details on the Multi Scooter Aggregates tab, see the topic, [About Multiple Scooters](#).

Important Things to Note

- If you have more than five variables displayed as line traces, you must scroll down to view this information in the Legend panel.
- From the Menu Bar, click the  icon to collapse the Control Panel. This provides room to display additional line traces.
- In general, use the horizontal and vertical scrollbars to view pen values outside of the XHQ Trend Viewer window.
- To view the entire Legend table within the XHQ Trend Viewer window, you can resize the table columns and/or resize the window.
- For columns too small to display the title, click anywhere inside the XHQ Trend Viewer and then mouse over the blank title bar. A Tooltip appears with the column title.
- To copy the contents of either a cell or a row to the clipboard, right-click on the cell (or a cell in the row you want to copy) and select **Copy Cell** or **Copy Row**. When copying a row, the cell values are separated by the list separator defined in the Windows Registry. For example, the same list separator is used in Excel exports. By default, Windows and Mac use the comma as the separator.

Legends		Multi Scooter Aggregates								
	Legend	Value Name	Description	Default Units	Precision	Current Value	@ 06/14/11 12:38:58 PM	@ 06/14/11 12:49:04 PM	Display Units	Units
<input checked="" type="checkbox"/>		XHG01.PPHD.LLIMIT	CO2 CONC	PCT	3	129.317	106.740	190.327	PCT	All
<input checked="" type="checkbox"/>		XHG02.PPHD.STAT	AIR TEMPERATURE		3	103.333	959.766	193.681		All
<input checked="" type="checkbox"/>		XHG03.PPHD.LOLIM			3	166.327	131.394	139.768		All
<input type="checkbox"/>				None					None	All
<input type="checkbox"/>				None					None	All
<input type="checkbox"/>				None					None	All

Legend Panel



For an embedded trend, trend properties and pen attributes can be pre-configured during design time. In runtime, when you launch the XHQ Trend Viewer from the embedded trend, the properties you set are automatically applied.

Legend Panel Columns

Column	Description
<Column 1: Checkbox>	Enable this option to render the trace visible on the Trend Chart.
Show Trend	Tip: For columns too small to display the title, mouse over the blank title bar. A Tooltip appears with the column title.
<Column 2: Radio Button>	Enable this option to display a single trace.

Column	Description
Select Single Scale	Tip: For columns too small to display the title, mouse over the blank title bar. A Tooltip appears with the column title.
Legend	This displays (among other properties) the style, values, units, aggregate, and tolerance assigned to the pen.
Value Name	This displays the tag/pen value name. You can also enter an alias or the fully-qualified path of the tag.
Description	If the pen is a valid tag or tag collection key, this field displays the tag's description, given that the description tag attribute is set (from the Component Details tab).
Default Units	If the pen is a valid tag or tag collection key, this field displays the tag's unit, given that the unit tag attribute is set (from the Component Details tab).
Precision	Displays the current precision for the given pen. At runtime, this value is editable.
Current Value	This displays the current pen value. Note: If the expression has multiple references , then Current Value column is blank .
Scooter Value	If the scooter is defined, this displays the precise value for the pen at the scooter position. A column is added for each scooter. The column header displays the date/time of the scooter. See Also: For more information, see the topic, About Multiple Scooters .
Display Units	Displays the unit.
Units Category	Displays the unit category.
<Column 10: Checkbox> Select Manual Scale	Enable this option to manually enter Minimum limit and Maximum limit values. Tip: For columns too small to display the title, mouse over the blank title bar. A Tooltip appears with the column title.
Min	This displays the minimum y-scale value.
Max	This displays the maximum y-scale value.
Scale	This displays the scale axis on the left or the right of the chart.
Curve Fit	Curve fitting is the approach of finding equations of approximating curves that fit given sets of data. Currently, two types of curve fits are available: Linear and Simple Average. <i>Default value:</i> None
Aggregate	This displays the history retrieval type: <ul style="list-style-type: none"> • Fits • Average

Column	Description
	<ul style="list-style-type: none"> • Min • Max • Interpolate • Raw <p><i>Default value:</i> Fits</p>
Aggregate Interval	<p>The <i>aggregation interval</i> is the interval over which the aggregate is computed. These intervals are defined in seconds, minutes, hours, days, or weeks.</p> <p>You can select from the given set of aggregate interval values listed or enter any desired aggregation interval by typing it directly in the interval field.</p> <p>Note: The aggregation interval is meaningful only for the Average, Min, Max, and Interpolate retrieval types. It has no affect on retrieval of Raw or Fits data.</p>
Master Pen	<p>When you designate a pen as the Master Pen, its scale format, scale precision, value format, value precision, and tolerance is used for the entire pen group.</p> <p><i>Default value:</i> None</p> <p>Important: In the XY-plot mode, the first pen on the pen value list is the X-value pen. The subsequent pen(s) are the Y-value(s). An important thing to note is that the X-value pen cannot be part of a pen group. It is <u>invalid</u> for the X-value pen to be either a master pen or a slave pen. The Master Pen selection list will not include the X-value pen when in the XY-plot mode.</p>
Tolerance (%)	<p>This is the <i>pen tolerance</i>. The pen tolerance is the percentage value applied to the maximum/minimum when calculating the high/low limit of each trend.</p> <p>If this value is not set in the embedded XHQ Interactive Trender, the default tolerance value of 5% is used.</p>
<Column 19: Checkbox> Future Data	<p>If checked, future data points are retrieved. If unchecked, only historical data points are retrieved.</p>
Interpolate Type	<ul style="list-style-type: none"> • Default The interpolate type is determined by the backend data configuration. • Linear Uses a linear line to connect two data points. • Stepped Uses a stepped line to connect two data points. <p>Note: The client trend configuration for an interpolation type has only visual impact on the data points connection. It does not change the interpolation type of the backend data source.</p>

3 | Using the XHQ Trend Viewer

This section covers the various tasks involved in the trend chart display of the XHQ Trend Viewer (the XHQ Interactive Trender). You will learn how to do the following.

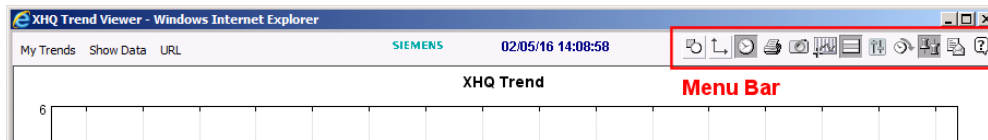


For an embedded trend, trend properties and pen attributes can be pre-configured during design time. In runtime, when you launch the XHQ Trend Viewer from the embedded trend, the properties you set are automatically applied.

For more information on configuring the embedded trend, see the topic, [*Configuring an Embedded Trend*](#), located in the XHQ Developer's Guide.













Using the Menu Bar

The Menu Bar is located at the top, right-hand corner of the XHQ Trend Viewer.



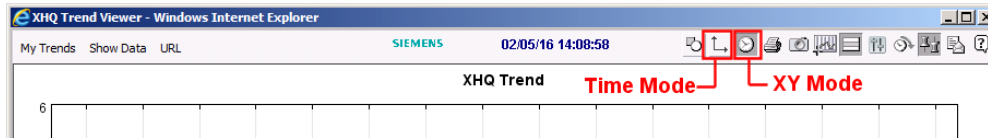
The following table summarizes the tools available from the Menu Bar.

Menu Bar Tools

Icon	Description
	Toggles the trend symbols.
	Displays the XY plot .
	Displays the Time plot .
	Prints the trend.
	Saves the trend.
	Adds the current trend to "My Trends".
	Shows/hides the Control Panel .
	Launches the "Trend Options" dialog, which allows you to set certain trend properties .
	Refreshes the trend, setting the End Time to Now().
	Toggles the Start Time, Span, and End Time push pins .
	Sends the trend URL.
	Launches the XHQ WebHelp.

Displaying the Trend in Time or XY Mode

From the XHQ Trend Viewer **Menu Bar**, you can toggle between **Time** and **XY-modes** by clicking on the appropriate icon.



Using Time or XY-Mode



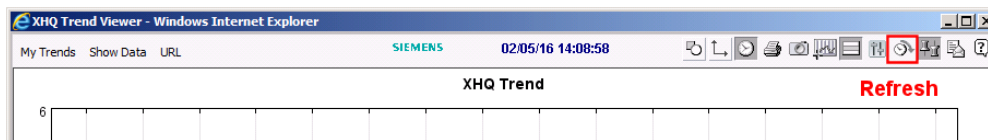
Switching from Time mode to XY mode, and back to Time mode causes the resulting trends to be different.

For Time plot, the default aggregate is "Fits." For XY-plot, the default is "Interpolate." "Fits" and "Raw" are not available for the XY-plot. Therefore, if you switch from Time mode to XY mode, the aggregate interval will automatically change from "Fits" to "Interpolate", since "Fits" is not a valid time slice mode for the XY-plot. If you switch *back* to Time mode, however, the aggregate interval *remains* at "Interpolate", causing the resulting trend to be different from the initial time plot, which had an aggregate interval of "Fits".



For more information on configuring the embedded trend, see the topic, [Configuring an Embedded Trend](#), located in the XHQ Developer's Guide.

Refreshing the Trend

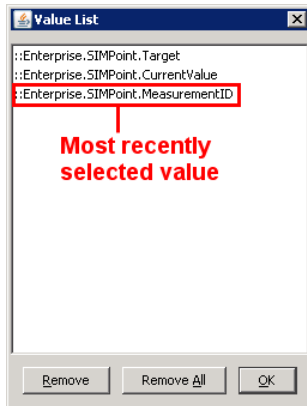


Click the **Refresh** button to set the End Time to Now(), or the current time. During a trend refresh, the Span is unchanged and fixed (or "[pinned](#)", cannot be edited).

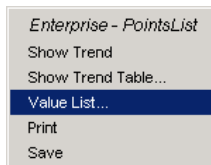
About the Value List

A value item is added to the Trend Value list when any of the following occur:

- You mouse over a value item, right-click, and, from the shortcut menu, click **Select**;
- You mouse over a value item, right-click, and click **Show Trend**;
- You mouse over a value item, right-click, and click **Show Trend Table**.



Value List – Most-recently selected value



Example: Right-Click Shortcut Menu – Value List



Example: Value List dialog box

You can add up to sixteen variables (values) to view on the Trend Viewer. If you add more than sixteen values, the "oldest" (the first one you selected) is omitted to make room for the "newest" (the most recent value you added). The "most recently" selected value (the "default" value) will appear at the end of the list. The values you select represent the pens that display on the Trend Viewer.

To view your values list, right-click anywhere on the view and select **Value List** from the shortcut menu.

This dialog box appears. To edit the list, you simply select the value(s), or pen(s), you want to remove and click **Remove**.

To edit selected values (pens)

1. Right-click anywhere on the view.
The right-click shortcut menu appears.
2. Select **Value List**.
The "Value List" dialog box appears.
3. From the list, select the values (pens) to remove, click **Remove** and then click **OK**.

Adjusting Time Parameters

You can adjust the XHQ Trend Viewer time parameters directly from the Control Panel.

Start Time	Span	Units	End Time	Retrieve	Scale	Type	Min	Max
04/24/10 04:48:00 PM	2.00	Hours	04/24/10 06:48:00 PM	Retrieve	All	Linear		

Control Panel: Time Parameters

For the XHQ Trend Viewer Start Time and End Time, you can enter a string expression or a string constant.

Next to each of the Start Time, Span, and End Time labels is a **push pin icon**. This push pin icon indicates whether the time/span is fixed (and cannot be edited). For example, in the image above, the pin next to End Time is facing down and the time is grayed-out. This indicates that the End Time is fixed. The push pin icons next to Start Time and Span are sideways, and so both values can be edited. In this case, because the End Time is fixed, the Span is applied to the Start Time.

Things to Note

- Clicking on the push pin icon toggles the command.
- At any given time, one of these time parameters is in the fixed position.
- The default of End Time is the current time; the default of Span is two (2) hours; and the default Start Time is calculated using the default End Time minus the default Duration.
- From the XHQ Trend Viewer **Menu Bar** (upper right corner), click the **Push Pin button** to either show or hide the push pin icons.

Menu Bar - Push Pin



When the push pin icons are *hidden*, only the start and end times are editable; the span and unit boxes are not. In this case, the span value is calculated based on the start and end times. As a result, the user can easily set the start and end times for a trend regardless of the duration.

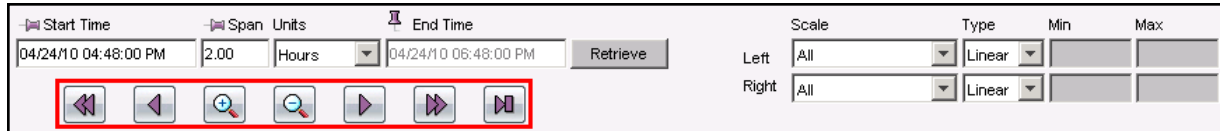
- In addition, you can control the *initial state* of the Push Pin button by setting the global property, **DisableTrenderPin**.



For more information on global properties, go to the topic, [Working with .PROPERTIES Files](#), located in the XHQ Administrator's Guide.

Panning or Zooming on a Chart

You can shift the trend backward or forward in time, or zoom in or out by clicking on the VCR-type buttons in the Control Panel.



Control Panel: Panning or Zooming



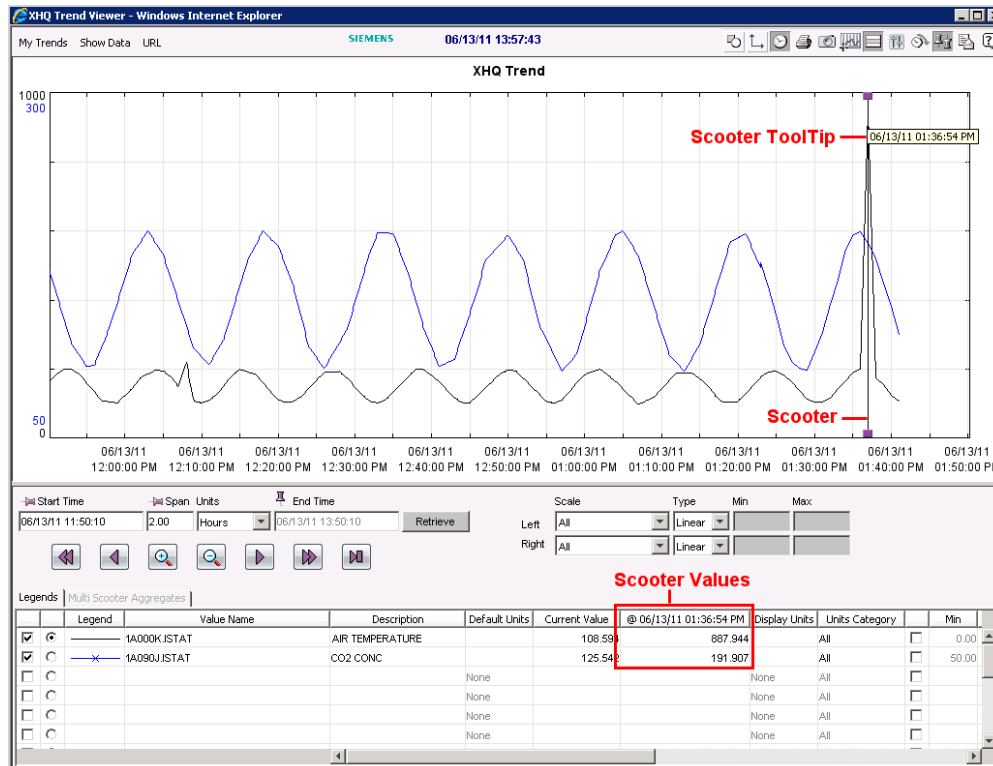
If the scooter is visible, the zoom operates based on scooter time. This means the zoom is performed so that the scooter value is always equidistant from the start time and the end time. If the scooter is not visible, XHQ zooms in or out and keeps the center point constant.

Control Panel Tools

Icon	Description
	This is a left pan button that shifts the displayed trend back in time by an amount equal to the selected span .
	This is a left pan button that shifts the displayed trend back in time by an amount equal to one-half of the selected span .
	This is a zoom in button that decreases (by a half, for each click) the span of time over which the trend is displayed.
	This is a zoom out button that increases (doubles, for each click) the span of time over which the trend is displayed.
	This is a right pan button that shifts the displayed trend forward in time by an amount equal to one-half of the selected span .
	This is a right pan button that shifts the displayed trend forward in time by an amount equal to the selected span .
	This is a scroll to the end button that moves the span to adjust the display to show the current time at the right side of the trace.

Using Scooters

The *scooter* is a single vertical line that intercepts all the line traces in the XHQ Trend Viewer at a particular point in time. From the Legend Panel, the **Scooter Value** column (as indicated by the scooter date/time header) displays the precise value for each variable at the scooter position. Consequently, you can compare one value with another at the same point in time.



Legend Panel: Scooter Value

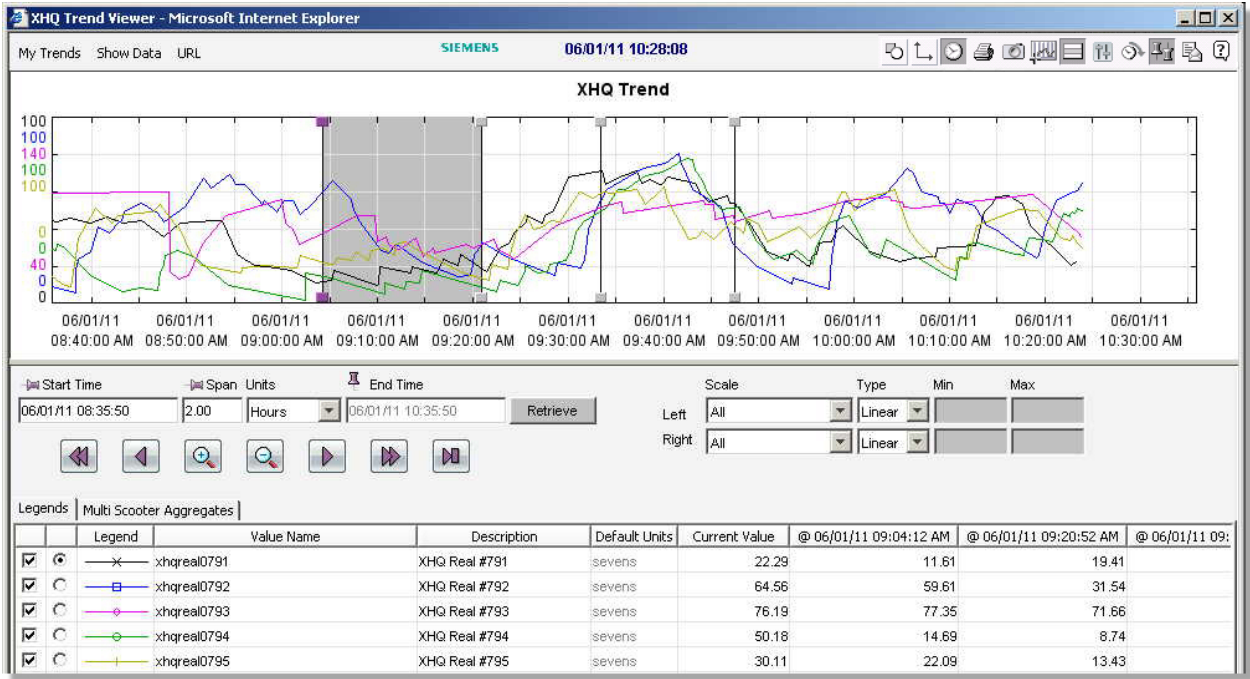
To use the scooter to pinpoint displayed values

1. With the XHQ Trend Viewer displayed, use your mouse to **move** to the point where you want the scooter to appear.
2. **Click** the left mouse button.
The scooter appears. The exact point the scooter is positioned on the X-axis (time and date) is displayed in the Scooter column header. The purple square at either end indicates that it is active.
3. To **move** (or nudge) the scooter left and right, do one of the following:
 - Press the left or right arrow keys (on your keyboard) once to nudge the scooter **one** pixel to the left or right, respectively.
 - or
 - Hold down the **SHIFT** key and press the left or right arrow keys once to move nudge the scooter **five** pixels to the left or right, respectively.
 - or
 - Hold down the **CTRL** key and press the left or right arrow keys once to nudge the scooter **ten** pixels to the left or right, respectively.

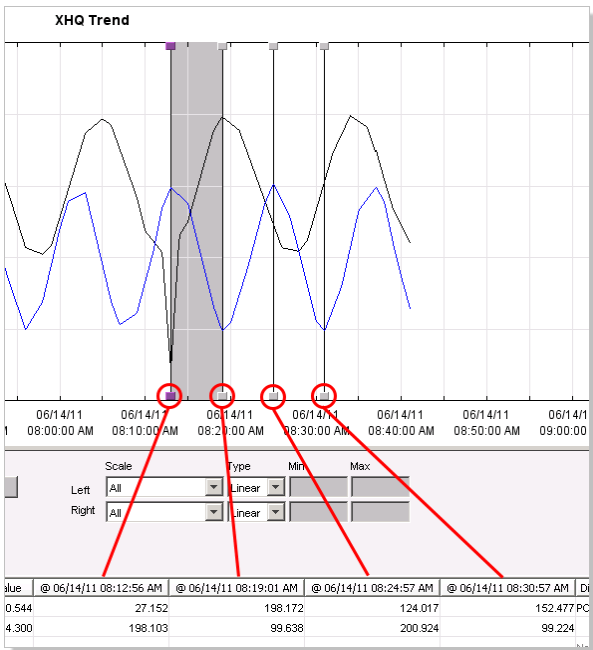
4. Turn the scooter **off** by clicking on the square at either the top or bottom of the scooter.

About Multiple Scooters

After placing the first scooter onto the Trend, you may place additional scooters by using a **CTRL+LEFT** click key combination. The maximum number of scooters per trend is **four**.



XHQ Trend Viewer: Multiple Scooters

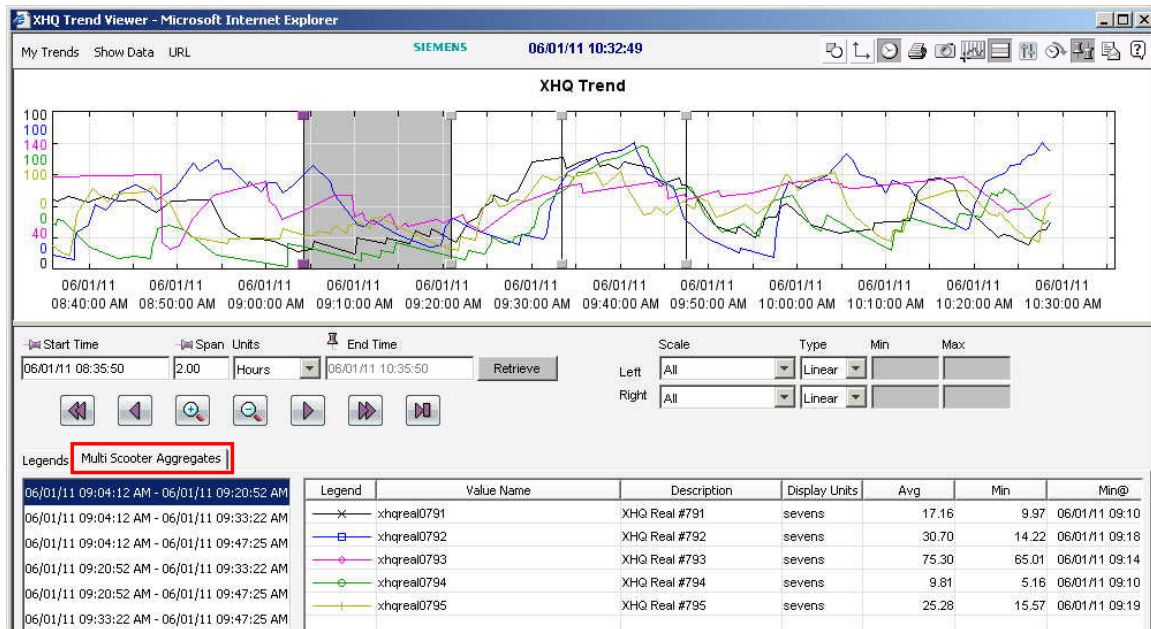


Scooter Indicators

The same rules, for moving or deleting a single scooter, apply to multiple scooters. The purple square at either end of the scooter indicates that the scooter is active and is the only one that can be moved or nudged.

In the **Legend Panel**, a column is added for each scooter. The column header displays the date/time of the scooter. The scooter date/time is also displayed as a ToolTip (which appears when you hover over the scooter).

When two or more scooters are present, the **Multi Scooter Aggregates** tab is enabled. This tab displays the aggregate values between two selected scooters (which appears as the highlighted area between two scooters). The aggregate values are: Average, Minimum, Maximum, Count, Integral, Delta.



Multi Scooter Aggregates Tab

The highlighted date/time (in the column directly below the tabs) indicates the aggregate pairs and corresponds to the two scooters the border the highlighted area. For example, in the image above, the first aggregate pair is highlighted (in dark blue). This pair is defined by the first and second scooters; and so, the area between these two scooters are highlighted (in gray) in the trend.



You can set the highlight color for the area between the aggregate scooter pair one of two ways:

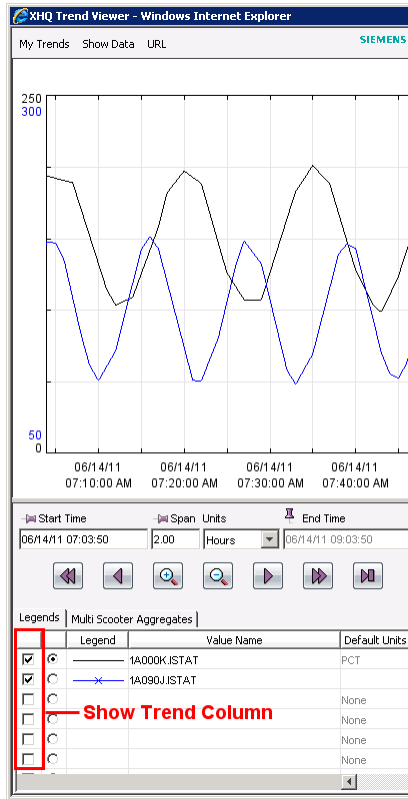
- Through the Trend Options dialog; see the topic, [Setting Trend Chart Properties](#);
- Or, by setting the InteractiveTrenderDefaultShadeColor global property; see the topic, [The XHQ Navigation Bar](#), located in the XHQ Solution Viewer User's Guide.

The global property setting overrides the XHQ default. The Trend Options setting overrides the global property and/or the XHQ default.

To copy the contents of either a cell or a row to the clipboard, right-click on the cell (or a cell in the row you want to copy) and select **Copy Cell** or **Copy Row**. When copying a row, the cell values are separated by the list separator defined in the Windows Registry. For example, the same list separator is used in Excel exports. By default, Windows and Mac use the comma as the separator.

Viewing Line Traces

Click or clear the checkbox under the first column of the Legend Panel to render a trace visible or invisible. When the XHQ Trend Viewer is first displayed, all line traces are displayed.



Legend Panel: Show Trend, Viewing Traces

Things to note when working with Pen Groups

- If the master pen in a group is hidden, then all the pens in the group will be hidden.
- When a pen group is hidden, making any pen in the group visible will make the whole group visible.
- If a slave pen in the group is hidden, then the slave pen is not part of the group min/max calculation.



For more information on minimum and maximum values, go to the topic, [Setting Min and Max Values](#).

To render a trace visible or invisible

1. In the first column of the **Legend Panel**, click the **checkbox** next to the name of the variable whose line trace you want visible.
2. **Clear** the **checkbox** to make the line trace invisible.

Showing a Line Trace in Symbol Form

With the line trace(s) displayed in the XHQ Trend Viewer, you can convert the line trace(s) in the XHQ Trend Viewer to symbol mode. Symbol mode displays a symbol for each plot point, so that you can print the trend in black and white and differentiate among line traces.



Symbols are displayed in the XHQ Trend Viewer only if they were set in the corresponding embedded Trender.

To view the line trace(s) in symbol mode

1. In the **Menu bar** of the XHQ Trend Viewer, click **Toggle trend symbols**.
This displays the assigned pen symbol(s) on the Trend Chart.
2. Click **Toggle trend symbols** again to revert to normal line trace mode.

Adding a Line Trace to the XHQ Trend Viewer

XHQ allows you to add or delete variables directly from the XHQ Trend Viewer. You can add or delete points to change a trend on view and leave it for the duration of the browser session with different variables, and still have the option of recalling the original trend list. In this case, you do not need to select Update Value List unless you want to change the Value List.

Line Trace Naming Convention

The name of the variable for each line trace (pen) is displayed in the Value Name column of the Legend panel. The name can either be:

- The fully qualified pathname of the variable from the solution tree.
Example: Phazer_Electronics.Los_Angeles.Operations.invmanual6
- Or, an *alias* assigned to that full pathname. An alias can have any combination of alphanumeric characters, spaces, "!", "\$", or "+" signs.

Example: invmanual6



The alias name is assigned in the General tab during the solution component configuration process.



Refer to the topic, [Using Aliases](#), which is located in the XHQ Developer's Guide, for more information about assigning aliases.

To add a variable (and line trace) to the XHQ Trend Viewer

1. In the Legend Panel, click inside an empty **Value Name** field.
2. **Enter the alias name** that has been pre-defined in the XHQ Solution Builder for the variable you want to add to the XHQ Trend Viewer.



Refer to the topic, [Using Aliases](#), which is located in the XHQ Developer's Guide, for more information about assigning aliases.

3. Click **Enter**.

To delete a variable (and line trace) from the XHQ Trend Viewer

1. Under the **Value Name** column, select a variable by highlighting the name.
2. Press **Delete** and then press **Enter**.
The variable and its associated line trace and values are removed from the Legend Panel and the XHQ Trend Viewer.



Although you have deleted the variable and line trace from the current invocation of the XHQ Trend Viewer, the original value list you created is still maintained in the value list you access using the right-click menu.

Setting the Scale (Y-axis)

The XHQ Trend Viewer Scale (y-axis) has four display modes:

- **All**
Enables you to view the y-scale values for all traces (All).
- **Single**
Enables you to view the y-scale value for a single trace.
- **Common-Auto**
Automatically sets a common max and min value for all pens displayed.
- **Common-Manual**
Enables you to set a common max and min value for all pens displayed.



Control Panel: Scale

About Single Scale

In **Single** Scale mode, the Y-scale displays the trend values for the trace you selected. To select a trace, you simply click the corresponding radio button in the second column of the Legend panel.

About All Scales

When the XHQ Trend Viewer is first invoked, the default mode is **All** Scales.



This may not be the case for a XHQ Trend Viewer that is launched from an embedded trend. For embedded trends, trend properties and pen attributes can be pre-configured during design time. In runtime, when you launch the XHQ Trend Viewer from the embedded trend, the properties you set are automatically applied. For example, if you set the Scale property to Common-Manual during design time, then when you launch the XHQ Trend Viewer from the embedded trend, the Common-Manual scale displays.

All Scales mode displays the relative minimum and maximum values for all your traces. A pair of labels appear for each trace, matching the given trace color. The maximum values are at the top of the Y-scale, and the minimum values at the bottom. The maximum values are in descending order, according to the order of their appearance in the legend panel. The minimum values are in ascending order.

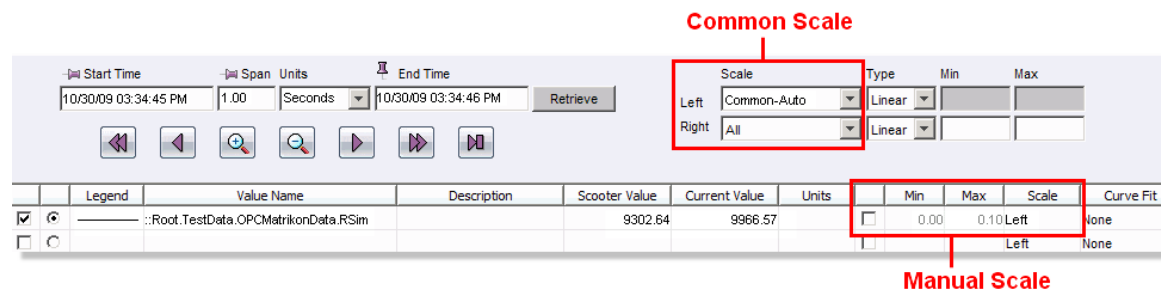
Things to note when working with Pen Groups

When the Scale is set to **All** for a pen group, the attribute of the master pen (such as tolerance, precision, or color) are applied. The high/low limit of the pen group is determined by the min/max and the tolerance of the master pen.

Setting Min and Max Values

From the XHQ Trend Viewer, there are two ways of setting Min and Max Values. The first is by *common scale*.

From the Scale drop-down box, located on the Control Panel, select **Common-Auto** to automatically set a common max and min value for all pens displayed; or select **Common-Manual**, to manually enter a common max and min value the given pen.



Setting Min and Max Values by Common Scale or by Manual Scale Input

The second way to set Min and Max values deals with enabling *manual input*. The checkboxes to the left of the Trend Scale Min and Max Values allow you to disable or enable manual input of min and max values.

To manually adjust the min and max values

1. In the **Legend panel**, to the left of the Trend Scale Min and Max text boxes, click the checkbox next to the variable for which you want to change the minimum and/or maximum values.
The Min and Max values display in the same trace color.
2. **Enter a minimum value** in the Min text box **and a maximum value** in the Max text box.
The appropriate line trace immediately rescales to match your entry.

About the Logarithmic Trend Scale

In addition to Linear, you can also set the scale type to:

- **Log10**
Which is the *common* logarithm of base-10. To use Log10 based format, set `UseLog10BaseFormat=true` in `globalsetting.properties` file.
- **Log**
Which is the *natural* logarithm of base-e.

The *logarithm* of a given number is the power to which the base is raised to yield the number.

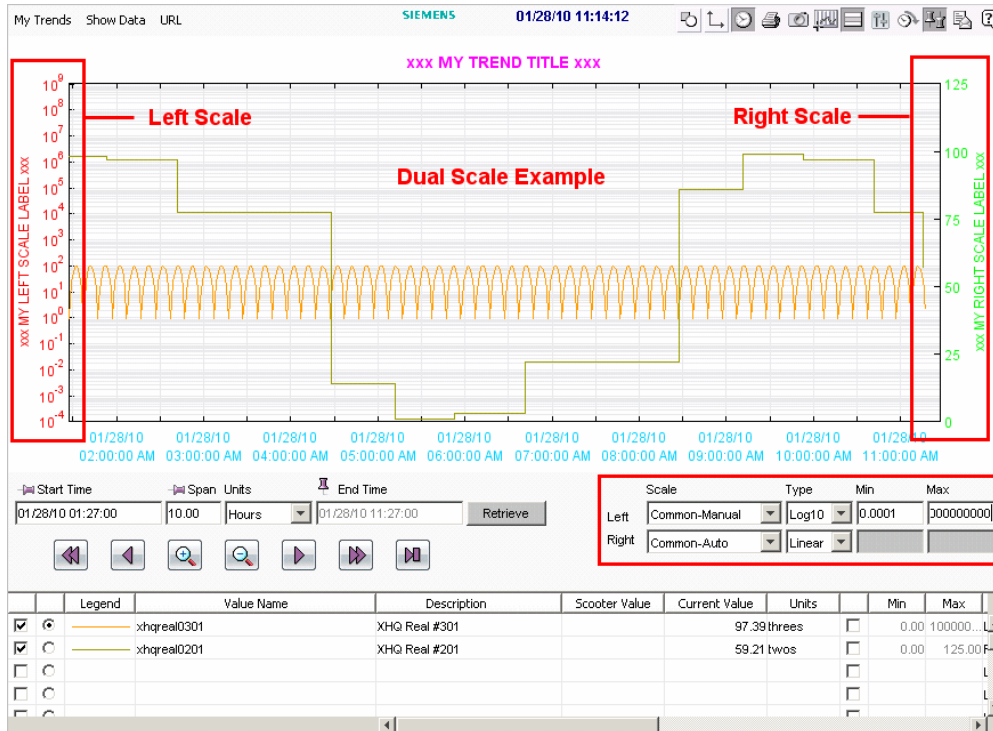
So, logarithm (base b) of $n=x$ if $b^x=n$.

Where n is the given number; b is the base; and x is the power raised.

Also, $(\text{base})^{\log(n)}=n$.

Using Dual Scale

Pens can be assigned to display in either the Left- and/or Right-hand Y-scale.



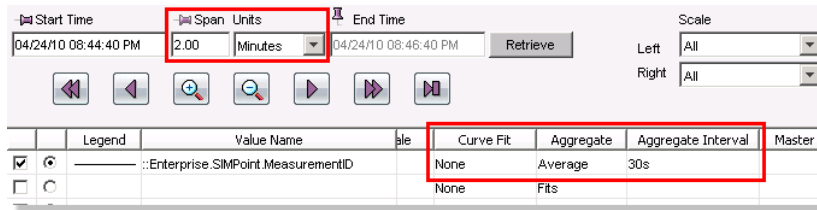
Dual Scale Example

In the example above, the **Left scale** is set to Common-Manual, so a Min value of 0.0001 and a Max value of 1000000000 is manually entered. Because the Scale Type of Log10 is selected, the scale tick marks are displayed in the standard logarithm scale of base 10, with a Min value of 10^{-4} and a Max value of 10^9 .

The **Right scale** is set to Common-Auto, and so a common Min and Max value is automatically set for all pens displayed. In this case, it is a Min value of 0.00 and a Max value of 125.00. The Scale Type is Linear.

Working with Aggregate Trends

There are basically three steps to setting an aggregate trend through the XHQ Trend Viewer.



The screenshot shows the XHQ Trend Viewer interface. The 'Span' field is set to '2.00' and the 'Units' dropdown is set to 'Minutes'. The 'Aggregate' dropdown is set to 'Average'. The 'Aggregate Interval' is set to '30s'. The 'Curve Fit' is set to 'None'. The 'Master P' is set to 'None'. The 'Scale' is set to 'All'.

Steps to Setting the Aggregate Trend

- **Step 1**
Set the total time span of the trend.
- **Step 2**
For time-sliced retrieval types (Average, Min, Max, and Interpolate), select an aggregation interval.
- **Step 3**
Select a history retrieval type.



Currently, a maximum of 10,000 points can be plotted within a given time span. If exceeded, only the oldest 10,000 points will be plotted.

For example, this limitation corresponds to roughly one week of 1-minute aggregates, 10 weeks of 10-minute aggregates, or one year of 1-hour aggregates.

About the Aggregate Interval

The *aggregation interval* is the interval over which the aggregate is computed. These intervals are defined in seconds, minutes, hours, days, or weeks.



The aggregation interval is meaningful only for the Average, Min, Max, and Interpolate retrieved types. It has no effect on retrieval of Raw or Fits data.

The aggregate interval values, listed in the Aggregate drop-down list of the Control panel, can be set by the administrator, by editing the `globalsettings.properties` file. You may also enter any desired aggregation interval by typing it directly in the interval field.



For more information on global properties, go to the topic, [Working with .PROPERTIES Files](#), located in the XHQ Administrator's Guide.

About the History Retrieval Types

The following table describes the available history retrieval types.



About Time Slices

The overall period of time is divided into multiple time intervals, or time slices. For each time slice, a value, or set of values, is/are determined. For example, the "time-sliced minimum" for a day with an interval of 1 hour produces 24 values; one value for each one-hour slice. The minimum value is determined within each interval.

The same logic applies for maximum, average, interpolated and, to some extent, FITS.

History Retrieval Types

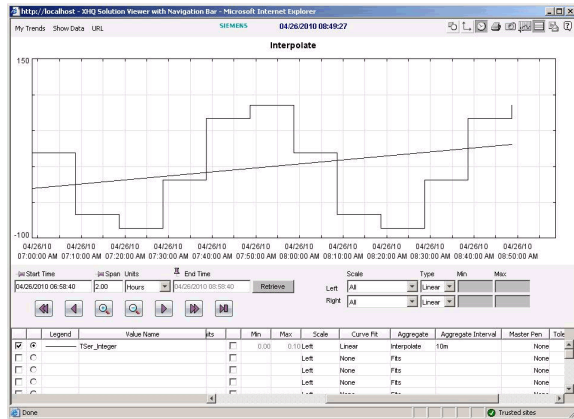
Type	Description
Fits	<p>Up to 1,000 raw data values selected to reproduce the appearance of plotting raw data. It picks min,max, and endpoints for equal time intervals (slices) within a specified period of time.</p> <p>The XHQ implementation of FITS divides the requested interval on 199 intervals to provide total maximum 1,000 points. For each slice, it returns a maximum of five (5) points: two (2) interpolated endpoints, one (1) minimum within the slice, one (1) maximum, and one (1) bad quality point (if present in the slice).</p> <p>Note, the aggregation interval is not used in this mode.</p>
Average	The average value over each aggregation interval.
Min	The minimum value during each aggregation interval.
Max	The maximum value during each aggregation interval.
Interpolate	An interpolated value at the beginning of each aggregation interval. It returns one interpolated value for each slice.
Raw	Data straight from the historian. The aggregation interval is not used in this mode.



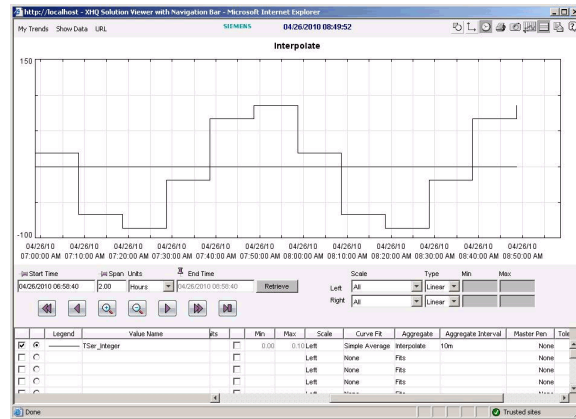
The timestamp of each aggregate value is the time at the beginning of the aggregation interval. For example, a one-hour average value with a time of 1:00 pm is the average over the interval from 1:00 pm through 2:00 pm.

Using Curve Fits

Curve fitting is the approach of finding equations of approximating curves that fit given sets of data. Currently, two types of curve fits are available: Linear and Simple Average. Linear and Simple Average curve fits are plotted as straight lines.

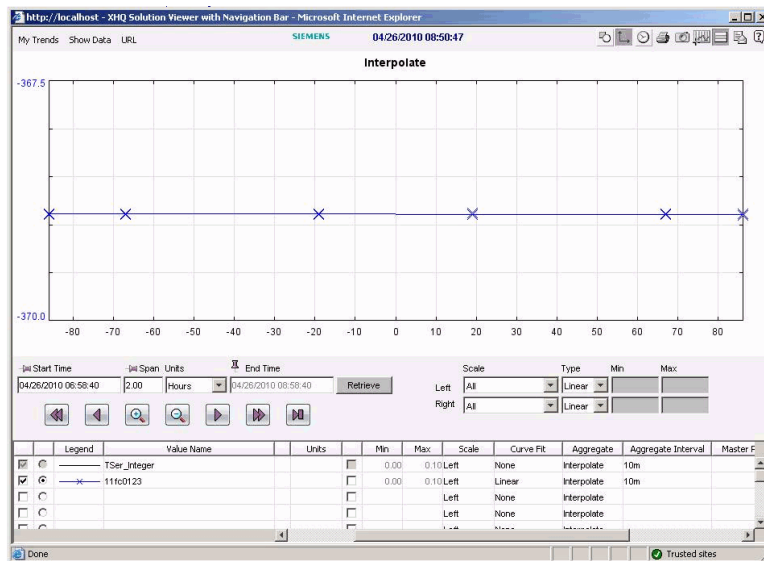


Time Mode - Linear



Time Mode – Simple Average

From the Trend Viewer, *Time Mode* supports both Linear and Simple Average curve fits. *XY Mode* only supports Linear.



XY-Mode - Linear

A curve fit is plotted as a solid line, with single thickness, and in the same color as the pen value.



All calculations are done using points containing GOOD quality. All other points are ignored.

About Linear Curve Fits

A linear [regression] line has the form $y = a + bx$.

For the *Correlation Coefficient*, **b**:

$$b = \frac{\sum \{ (x_i - x_{\text{mean}}) (y_i - y_{\text{mean}}) \}}{\sum \{ (x_i - x_{\text{mean}})^2 \}}$$

for $i = 1$ to n .

$$a = y_{\text{mean}} - b * x_{\text{mean}}$$

Where y_{mean} and x_{mean} are the average means of $\{y_i\}$ and $\{x_i\}$ respectively, for $i = 1$ to n .

The X_{start} and X_{end} values of the x-axis range are then plugged into the $y = a + bx$ equation to obtain corresponding Y-values (Y_{start} and Y_{end} , respectively). The two points are connected with a straight line to get the linear regression line.

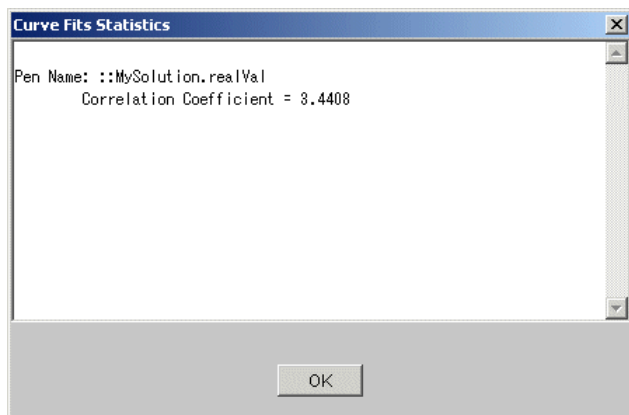
About Simple Average Curve Fits

Within a given set of points $(x_1, y_1), (x_2, y_2), \dots, (x_n, y_n)$, the Simple Average over the range of X-values is defined as:

$$\text{avg} = (y_1 + y_2 + \dots + y_n) / n$$

Accessing Curve Fits Statistics

You can retrieve curve fit statistics for each pen with a *Linear* curve fit. The Correlation Coefficient value is given for each pen selected.



A negative Correlation Coefficient indicates a line that slants downward from left to right, having a negative slope.

To plot a curve fit

1. From the **XHQ Trend Viewer**, select a mode (**Time** or **XY**).
2. For a pen value, select a **Curve Fit**.

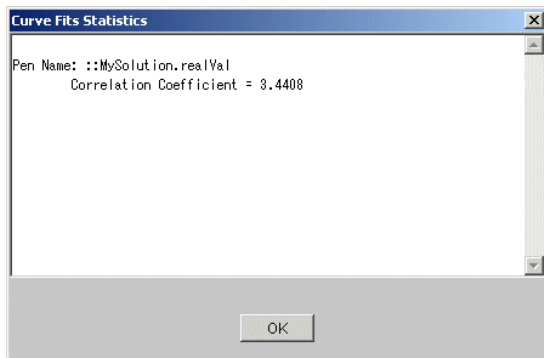


Time Mode supports both Linear and Simple Average curve fits. XY Mode only supports Linear.

To access curve fit statistics

1. From the XHQ Trend Viewer, click **Show Data**.
2. From the drop-down list, click **Statistics**.

The "Curve Fits Statistics" dialog box appears.



Using Expressions in the XHQ Interactive Trender

With the support for expressions in the XHQ Interactive Trender, you can reference multiple members in these expressions, using their full path name within the XHQ model, or a suitable alias.

EXAMPLES: VALID PEN EXPRESSIONS FOR THE INTERACTIVE TREND VIEWER

```
::MySolution.Component1.IntVal + 'intAliasName'
::MySolution.Component1.RealVal
'realAliasName' + 'realAliasName'
2*::MySolution.Component1.IntVal
sin (realAliasName)
```



Use the fully, qualified global path for the object. The path must begin with two colon characters (::) and each member in the path must be separated by a period (.). Also, tag names in tag calculations need to be enclosed in single quotes (' '). Consider the following examples:

'tag1'/1000

'tag1'*1000

'tag1' + 'tag2'

'tag1' - 'tag2'

'tag1'*2 - 'tag2'

The expression operators and functions you can use include:

+	%	atan2	floor	pow	sqrt
-	abs	ceil	log	random	tan
*	acos	cos	max	round	todegrees
/	atan	exp	min	sin	toradians



For more information on expressions, math operators, or functions, go to the [XHQ Reference Guide](#).

Expressions Containing More than One Reference

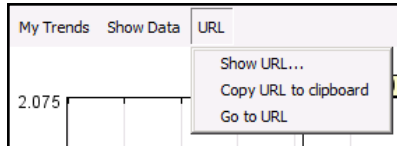
For a pen expression, the history for all reference members are retrieved using the Interpolated mode with the same time span for all members. Pen expressions with a single reference support all aggregate types. However, in any time-sliced mode, multi-reference expressions will only display historical data, not real-time data.



If all reference histories of an expression are in step-wise interpolation mode, then the resulting expression is also in step-wise interpolation mode.

Accessing the Trend Applet URL

XHQ generates the trend applet URL based on your trend configuration. You can access the trend applet URL by clicking on the URL button located on the **Menu Bar** of the XHQ Trend Viewer

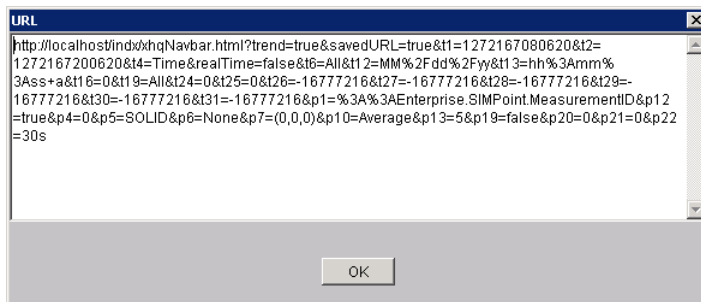


XHQ Trend Viewer: URL button

A shortcut menu appears with three options:

- **Show URL**

A window appears, displaying the trend applet URL.



- **Copy URL to clipboard**

This copies the URL of the current trend configuration onto the clipboard. To access it, open a text editor and Paste.

- **Go to URL**

This opens the URL in the same browser instance. The trend applet URL is then displayed in the address bar.

By accessing the trend URL, you can embed the trend applet directly into a web page. You can save instances of your trends, making it more convenient to access and view them. This is especially helpful if you have to track values daily.

Here are some more helpful uses:

- Create a URL link in a view to open a trend.
- E-mail a URL to a "live" Trend Viewer.
- Create a shortcut to frequently used trends.

About the Trend Applet URL

The trend applet URL defines how the XHQ Trend Viewer will display in the web page. The trend applet URL consists of the following parts:

- A **root path** followed by a question mark (?)
- A sequence of **general trend configuration parameters** separated by ampersands (&)
- A sequence of **pen configuration parameters** separated by ampersands (&)

The root path points to the page containing the applet that retrieves data from a solution:

```
http://hostname/contextpath/xhq.html
```

Example: `http://localhost/indx/xhqNavbar.asp?trend=true&savedURI=true&t1=1458233270185&t2=1458240470185&t4=Time&t5=Fits&t6=All&t12=MM%2Fdd%2Fyy&t13=hh%3Amm%3Ass+a&t16=0&t19=All&t22=&t23=&t24=0&t25=0&t26=-16777216&t27=-16777216&t28=-16777216&t29=-16777216&t30=-16777216&t31=-16777216&t32=-4144960&p1=TSer_Real&p12=true&p4=0&p5=SOLID&p6=None&p7=(0,0,0) &p10=Fits&p13=5&p19=false&p20=0&p21=0&p23=None&p24=None`

The root path is then followed by a combination of parameters that define the trend. These configuration parameters are mapped to existing trend and pen attributes. The following tables list the attributes you can set.

General Trend Configuration Parameters

Trend Attribute	Parameter	Description
Display Trend	trend	If TRUE, the trend is displayed. If FALSE, it is hidden.
Start Time	t1	The time to start retrieving trend values. Values are expressed in <i>milliseconds</i> . (Since 01-01-1970) <i>Example:</i> t1=30000 Restriction: You <u>cannot</u> use 't1' with 't3'.
End Time	t2	The time to stop retrieving trend values. Values are expressed in <i>milliseconds</i> . <i>Example:</i> t2=60000 The default value is "now" (which is the current time on ssHost). Notes: These notations are easy to generate using JavaScript.
Span	t3	The time span between the start of a trend interval to the end. By default, the units are in <i>milliseconds</i> . Alternate units can be specified using the 'units' parameter. Restrictions: Values must be greater than 0. You <u>cannot</u> use 't3' with 't1'.
Mode	t4	Displays the trend in either Time or XY mode.
Title	t5	Displays the trend title string.
Scale Type	t6	The type of scale. Values are: All, Single, Common-Auto, and Common-Manual. <ul style="list-style-type: none"> • All Enables you to view the x- and y-scale values for all traces (All). • Single Enables you to view the x- and y-scale value for a single trace. • Common-Auto Automatically sets a common max and min value for all pens displayed. • Common-Manual Enables you to set a common max and min value for all pens displayed.

Trend Attribute	Parameter	Description
Aggregate Interval	t7	<p>The <i>aggregation interval</i> is the interval over which the aggregate is computed. These intervals are defined in seconds, minutes, hours, days, or weeks.</p> <p>Note: The aggregation interval is meaningful only for the Average, Min, Max, and Interpolate retrieved types. It has no affect on retrieval of Raw or Fits data.</p>
Show Symbols	t8	<p>Determines whether or not symbols are displayed on the trend.</p> <p>The default value is <i>false</i>.</p>
Common Min	t10	<p>Sets a common min value for all pens displayed.</p> <p>Value type – float.</p> <p>Note: This parameter is used only when the scaletype=Common-Manual.</p>
Common Max	t11	<p>Sets a common max value for all pens displayed.</p> <p>Value type – float.</p> <p>Note: This parameter is used only when the scaletype=Common-Manual.</p>
Date Format	t12	This is how the date will be displayed.
Time Format	t13	This is how the time will be displayed.
Show Date	t14	<p>If TRUE, the date is displayed on the x-axis.</p> <p>If FALSE, it is hidden.</p>
Show Time	t15	<p>If TRUE, the time is displayed on the x-axis.</p> <p>If FALSE, it is hidden.</p>
Span Units	t16	<p>The units of measure for the span.</p> <p>Values can be expressed in <i>seconds, minutes, hours, days, or weeks</i>.</p> <p>Restrictions:</p> <p>If 't1' and 't2' are used, then the 'units' parameter is ignored.</p> <p>If both the 't3' and the 'units' parameters are specified, then the 'units' parameter defines the unit of measure for 't3'.</p> <p><i>Example:</i> t3=90&units=minutes</p> <p>This means that the span for the trend is 90 minutes.</p>
Left y-scale Label	t17	The label of the y-scale on the left side.
Right Scale Label	t18	The label of the y-scale on the right side.
Right Scale Type	t19	The scale type (t6) placed on the right side.
Right Scale Common Manual	t20	The Common Manual Minimum scale (t10) placed on the right side.

Trend Attribute	Parameter	Description
Minimum		
Right Scale Common Manual Maximum	t21	The Common Manual Minimum scale (t11) placed on the right side.
Left Scale Format	t22	The number format of the y-scale placed on the left side. Use standard number formatting pattern. For example, "0.##" means two digits. Leading zeros are omitted.
Right Scale Format	t23	The number format of the y-scale placed on the right side. Use standard number formatting pattern. For example, "0.##" means two digits. Leading zeros are omitted.
Left Scale Logarithmic Type	t24	The logarithmic type scale placed on the left side. The logarithmic types supported are: linear, log10, and log.
Right Scale Logarithmic Type	t25	The logarithmic type scale placed on the right side. The logarithmic types supported are: linear, log10, and log.
Left Scale Color	t26	The color of the y-scale on the left side. Enter <u>any</u> valid RGB value.
Right Scale Color	t27	The color of the y-scale on the right side. Enter <u>any</u> valid RGB value.
Left Scale Label Color	t28	The color of the label for the y-scale on the left side. Enter <u>any</u> valid RGB value.
Right Scale Label Color	t29	The color of the label for the y-scale on the right side. Enter <u>any</u> valid RGB value.
Title Color	t30	The color of the title. Enter <u>any</u> valid RGB value.
x-scale Color	t31	The color of the x-scale label. Enter <u>any</u> valid RGB value.
Scooter Shade Color	t32	The shade color for scooters. Enter <u>any</u> valid RGB value.

Trend Configuration Parameters for Scooters

Pen Attribute	Parameter	Description
Scooter Time	s1	The time the scooter is defined. Values are expressed in <i>milliseconds</i> (since 01-01-1970).

Pen Attribute	Parameter	Description
Note: A trend may have up to 4 scooters. For details, see the topic About Multiple Scooters on page About Multiple Scooters .		
Boolean Value	s2	If TRUE, the scooter is selected.

Trend Configuration Parameters for Pens

Pen Attribute	Parameter	Description
Pen Name	p1	<p>The fully-qualified name, or alias, of the XHQ member for which data is to be trended.</p> <p><i>Example 1 (fully-qualified):</i> ::solution1.plant0.line0.station2</p> <p><i>Example 2 (alias):</i> stationalias</p>
Pen Min	p2	<p>If the trend is manually scaled, this is the lower range or minimum value of the scale of the previous xhqPath.</p> <p>Note: In order to manually scale the trend, you must specify BOTH min and max values. Otherwise, the trend is automatically scaled.</p>
Pen Max	p3	<p>If the trend is manually scaled, this is the upper range or maximum value of the scale of the previous xhqPath.</p> <p>Note: In order to manually scale the trend, you must specify BOTH min and max values. Otherwise, the trend is automatically scaled.</p>
Pen Thickness	p4	Sets the trace line thickness. You can select a thickness from 0 (which has a thickness of 1 pixel) to 9, with 0 being the default.
Pen Style	p5	Sets the trace style. You can select from None, Solid, Dashed, or Dotted (Solid is the default.)
Pen Symbol	p6	Sets the trace symbol type.
		NONE PLUS_SIGN
		CROSS FILLED_CIRCLE
		SQUARE FILLED_TRIANGLE
		DIAMOND FILLED_SQUARE
		CIRCLE FILLED_DIAMOND
		TRIANGLE
Pen Color	p7	<p>Sets the trace color. Select a color from the list below or enter <u>any</u> valid RGB value.</p> <p><i>Example 1:</i> color=Red</p> <p><i>Example 2:</i> color=(255,0,0)</p>
		Red Orange
		Green Black

Pen Attribute Parameter		Description
		Cyan
		Magenta
		Blue
		Gray
		Yellow
		Lime
Display Values	p9	Set at TRUE or FALSE. If true, displays the y-axis value next to each point. The default is FALSE.
Aggregate Type	p10	The aggregation types available are Average, Min, Max, Interpolate, Fits, and Raw.
Hide/Show Pen	p11	Determines whether or not to display the trend. The default value is <i>true</i> .
Single Scale Selection	p12	Determines whether or not to make the trend the active trend among other trends (that may be available on the same web page). Note: Only one of the trendMembers can be selected. If more than one is denoted, then a trend is arbitrarily selected.
Tolerance	p13	The <i>pen tolerance</i> is the percentage value applied to the maximum and/or minimum when calculating the high and/or low limit of each trend.
Scale Format	p14	This displays the pen scale in the following formats: 1 - General 2 - Number-Scientific 3 - Number-Fixed
Scale Precision	p15	This defines the number of digits to display to the right of the decimal point for "Number-Scientific" and "Number-Fixed" formats.
Value Format	p16	This displays the pen value in the following formats: 1 - General 2 - Number-Scientific 3 - Number-Fixed
Value Precision	p17	This defines the number of digits to display to the right of the decimal point for "Number-Scientific" and "Number-Fixed" formats.
Master Pen	p18	The master pen defines the scale format, scale precision, value format, value precision, and tolerance for the entire pen group.
Future Data Flag	p19	A flag that indicates whether the pen allows for future data.
Pen Interpolation Type	p20	The interpolation type for the pen. Types supported are: Fits, Raw, Min, Max, Average, and Interpolate.
Scale Assignment	p21	The scale associated with the pen. A pen can be associated to either the left scale or the right scale.
Aggregate Average	p22	The aggregate interval for the interpolation type.

Pen Attribute	Parameter	Description
To Unit	p23	Covert to the given unit.
From Unit	p24	Convert from the given unit.

EXAMPLE: HOW TO TRANSLATE A TREND APPLET URL

The trend applet URL consists of the following sequence:

1. A **root path** followed by a question mark (?);
2. Followed by a string of **general trend configuration parameters** separated by ampersands (&);
3. Followed by a string of **pen configuration parameters** separated by ampersands (&).



Trend parameter names begin with the letter "t", scooter parameters with the letter "s", and pen parameters with the letter "p".

Consider this sample trend applet URL:

```
http://localhost/indx/xhq.html?trend=true&t1=30000&t2=60000
&t8=true&p1=Temp1&p4=0&p5=SOLID&p6=NONE&p7=(255,0,204) &
p10=Fits&p13=5
```

The trend URL begins with the root path followed by a questions mark:

http://localhost/indx/xhq.html?

Next, the general trend configuration parameters are defined. Each parameter listed is separated by an ampersand (&). In the example URL above, the general trend parameters are:

trend=true&t1=30000&t2=60000&t8=true

Where:

- t1 (Start time) is set to 30,000 ms;
- t2 (End time) is set to 60,000 ms;
- t8 (Show Symbols) is TRUE.

The general trend parameters are then followed by the pen configuration parameters:


p1=Temp1&p4=0&p5=SOLID&p7=(255,0,204) &p10=Fits&p13=5

Where:

- p1 is the pen name;
- p4 (Thickness) is set to zero;
- p5 (Style) is set to solid;
- p7 (Color) is set to RGB value 255, 0, 204;
- p10 (Aggregate Type) is set to Fits;
- p13 (Tolerance) is set to 5%.

Printing the Trend Chart

To print a chart

1. Open your **Trend Chart**.
2. From the **Menu Bar**, click the **Print** icon .

The "Print" dialog box appears. The default printer is automatically selected.

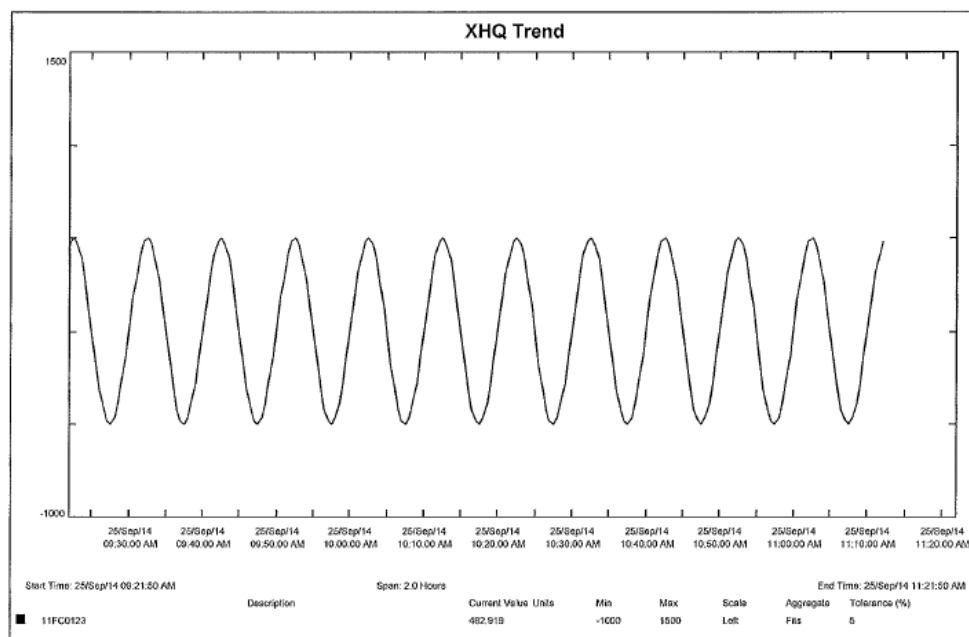
3. Finally, click **Print**.



The header includes the view name, the current time, and the (logged on) user name.

Trend Name - N/A
Current Time - Thu Sep 25 11:12:00 PDT 2014

User - INDX1\jamesma



Saving the Trend Chart

You can save the trend in either **JPEG** or **PNG** format.

To save the chart

1. From the **Menu Bar**, click the **Save** icon .

The "Save Trend" dialog box appears.

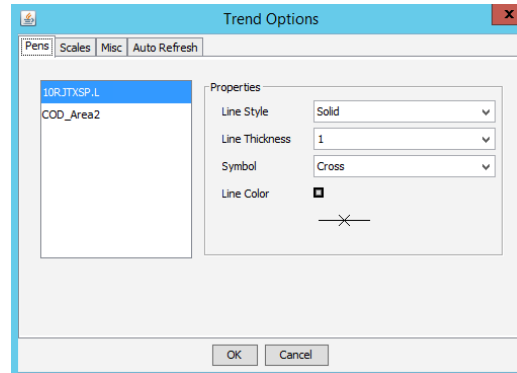
2. Enter a **filename**, select either the JPEG or the PNG format, and click **Save**.
The file is saved in the default directory Documents and Settings\<profilename>\Application Data\INDX\temp\print.

Setting Trend Chart Properties

You can set the following trend chart properties:

For Pens

- Line Style
- Line Thickness
- Symbol
- Line Color



For Scales

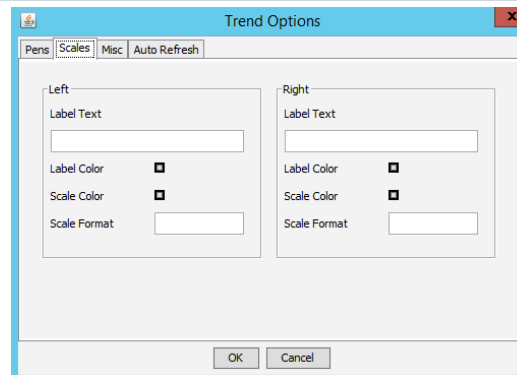
(Left or Right)

- Label Text
- Label Color
- Scale Color
- Scale Format

Scale Format Example

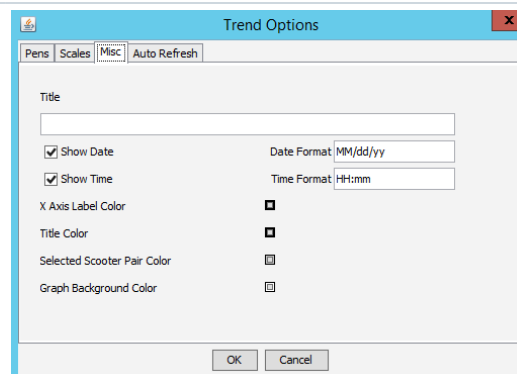
Given: The number 0.1

This Format:	Displays this:
#0.00	0.10
#.00	.10



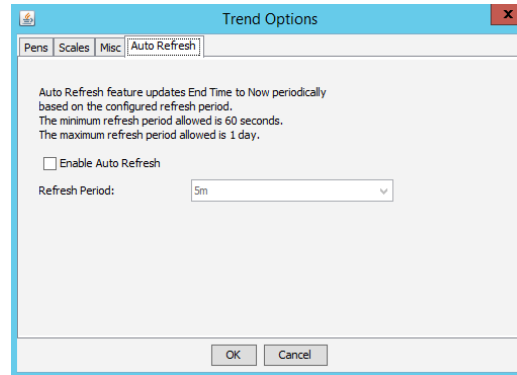
Misc Properties

- Chart Title
- Show or hide Date/Time
- Date/Time Formats
- X-axis Label Color
- Title Color
- Selected Scooter Pair Color
- Graph Background Color




Auto Refresh Properties

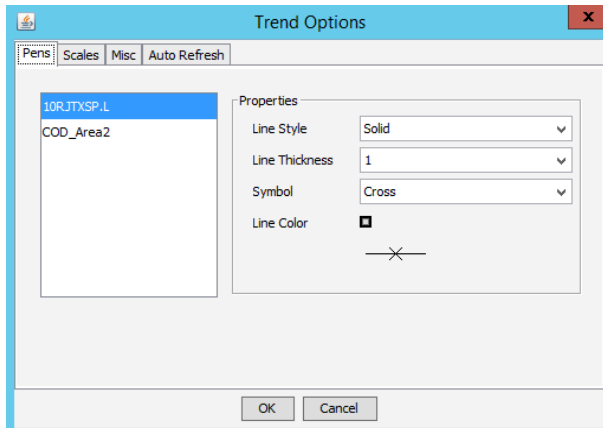
- Enable Auto Refresh
- Refresh Period




To set trend chart options

1. From the **Menu Bar**, click the **Trend Options** icon .

The "Trend Options" dialog box appears.




2. Do one of the following:
 - Click the **Pens tab** to set pen properties (such as line color, thickness, or pen symbol).
 - Click the **Scales tab** to set chart scale properties (such as text, color, or format).
 - Click the **Misc tab** to set miscellaneous chart properties (such as title, date/time format, label color, scooter pair color, or background color)
 - Click the **Auto Refresh tab** to enable and configure the auto refresh rate.

 When Auto Refresh is **enabled**, the XHQ Trend Viewer is in *auto play mode*, which means that the Start Time, Span, and End Time boxes are not editable. In fact, all time changing buttons (such as the "Retrieve" button) are disabled. The text, "Auto Refresh is On", is displayed.

You may select from the given set of refresh periods or enter your own. Note, however, the **minimum** refresh period allows is 60 seconds, and the **maximum** is 1 day.

The options listed in the **Refresh Period** drop-down can be customized by setting the global property, **AggregateAverageList**.

 For more information on global properties, go to the topic, *Working with .PROPERTIES Files*, located in the XHQ Administrator's Guide.

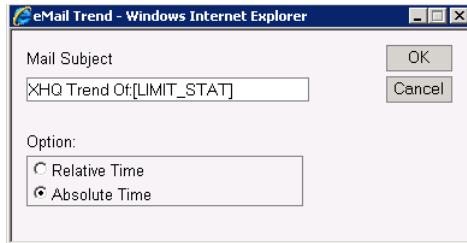
3. Click **OK**.

E-mailing the Trend Chart URL

To e-mail the chart URL

1. From the **Menu Bar**, click the **Send Email** icon .

The "eMail Trend" dialog box appears.



The **Mail Subject** automatically references the *appended* pen value name. That is, if the pen value name is : : XHQ01 . PPHD . LIMIT, then only the name after the last dot (or path separator) is referenced in the Mail Subject field, which in this case is LIMIT.

In this example image, two pens are referenced, LIMIT and STAT, and are separated by an underscore ("_").

2. Select either **Relative** or **Absolute** time.
3. Click **OK**.

This launches the e-mail client.

4 | Analyzing Trend Data

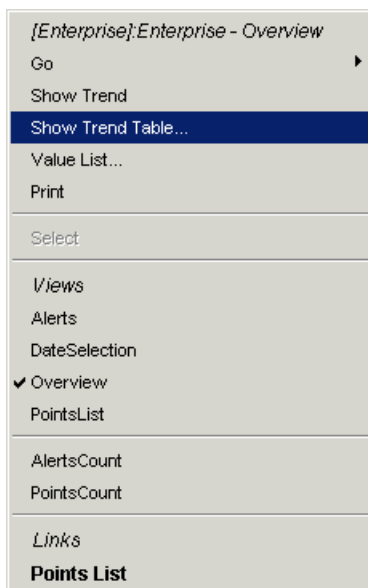
There are two ways to show trend data in a tabular format:

- Through the **Trend Table**
Implemented as an .html page
- Through **Excel**
Implemented as a .CSV file

Using the XHQ Trend Table

There are several ways to launch the XHQ Trend Table:

- From the right-click shortcut menu of a selected item.



You can also just point to a selectable value item, without having to **Select** it first, right-click and then click **Show Trend Table**.

- From the XHQ Trend Viewer, click the **Show Data** button.
- From the browser, enter a valid XHQ Trend Table URL.
- From the right-click shortcut menu of an embedded trend in a view.



Although the data display interval is configurable for most aggregates, when the Aggregate Type is set to "Fits" or "Raw", the data will always display in 8-second intervals, due to how this data is being called. The "Fits" and "Raw" options tell the XHQ Trend Viewer to display all data, but since the time of the data can vary from one pull time to another, all data time stamps are different.

To launch a trend table from the shortcut menu

1. **OPTIONAL**
Select a value item.
2. Point to a value item and right-click.
The shortcut menu appears.
3. Click **Show Trend Table**.
The trend table appears.

About the XHQ Trend Table URL

The XHQ Trend Table URL consists of the following parts:

- A **root path** followed by a question mark (?).
- A sequence of **general trend configuration parameters** separated by ampersands (&).

The root path points to the page containing the applet that retrieves data from a solution.

Example: `http://localhost/indx/xhqTrendTable.html`

The root path is then followed by a combination of parameters that define the trend. These configuration parameters are mapped to existing trend attributes.

Example: `http://localhost/indx/xhqTrendTable.html?trendtable=true
&t1=1204908080874
&t2=1204915280874
&aggregateavg=5m
&xhqPath=Enterprise.SIMPoint.CurrentValue&aggregateType=Max`

The following tables list the attributes you can set.

General Trend Configuration Parameters

Trend Attribute	Parameter	Description
Display Trend	trendtable	If TRUE, the trend is displayed. If FALSE, it is hidden.
Start Time	t1	The time in <i>milliseconds</i> to start retrieving trend values (relative to 01-01-1970).
End Time	t2	The time in <i>milliseconds</i> to end retrieving trend values (relative to 01-01-1970).
Aggregate Interval	aggregateavg	The <i>aggregation interval</i> is the interval over which the aggregate is computed. These intervals are defined in seconds, minutes, hours, days, or weeks. Note: The aggregation interval is meaningful only for the Average, Min, Max, and Interpolate retrieved types. It has no affect on retrieval of Raw or Fits data.
Path	xhqPath	The tag name, alias, or XHQ full-member path (such as <code>::root.AllTags.real1</code>).



Trend Attribute	Parameter	Description
Aggregate Type	aggregatetype	The aggregate type (which are Fits, Raw, Average, Min, Max, or Interpolate).

XHQ Trend Table Interface

The screenshot shows the XHQ Trend Table interface. At the top, there are input fields for Start Time (12/13/10 07:53:50), Span (2h), and End Time (12/13/10 09:53:50), along with a Retrieve button. Below these are dropdown menus for Aggregate (Raw), Interval (10m), Value Name (xhqreal0301), and Unit of Measure. The main part of the interface is a table titled 'XHQ Trend Table' with three columns: Time, Value, and Quality. The table contains four rows of data.

	Time	Value	Quality
1	12/13/10 07:53:01	95.4673	GOOD
2	12/13/10 07:54:01	74.5568	GOOD
3	12/13/10 07:56:06	14.2857	GOOD
4	12/13/10 07:57:01	0.9891	GOOD

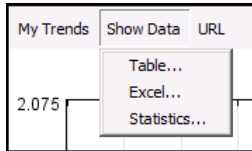
XHQ Trend Table Controls

Control	Description
	<p>This is a left pan button that shifts the displayed trend back in time by an amount equal to the selected span.</p> <p>For example, if the Span is set to 2 hours, then each time the Scroll Back button is clicked, the Start Time and End Time will change to 2 hours behind the current time being displayed in Start Time and End Time.</p>
	<p>This is a right pan button that shifts the displayed trend forward in time by an amount equal to the selected span.</p> <p>For example, if the Span is set to 2 hours, then each time the Scroll Forward button is clicked, the Start Time and End Time will change to 2 hours ahead of the current time being displayed in Start Time and End Time.</p>
Start Time	<p>Displays the start date and time.</p> <p>Note: You can set the time format from the globalsettings.properties file.</p>
Span	Sets the time span to view the trend.
End Time	<p>Displays the end date and time.</p> <p>Note: You can set the time format from the globalsettings.properties file.</p>
Retrieve	Sets the time scale (x-axis) to reflect the start, span, and end time values.
Aggregate	Allows the selection of Raw, Fits, Average, Minimum, Maximum, and Interpolate.
Interval	This is for how often you would like the data to be displayed.
Value Name	<p>This displays the name of the "default" (currently active) value.</p> <p>Only one pen can be displayed at a time. The pens that are displayed in the Trend Viewer are included in the Value Name list box of the Trend Table.</p>
Unit of Measure	Displays the unit of measure.
Table Columns:	
Time column	<p>Displays the time stamp of how often the data is displayed.</p> <p>For example, if the Interval time is 5 minutes, then the Time Stamp is set at every 5 minutes.</p>

Control	Description
Value column	Displays the value for the given Interval time.
Quality column	Displays the quality of the data: GOOD, BAD, or UNCERTAIN.

Using Excel to View Trend Data

This feature is available from the XHQ Trend Viewer, through the Show Data command located in the Menu Bar.



XHQ Trend Viewer – Show Data button, Excel option

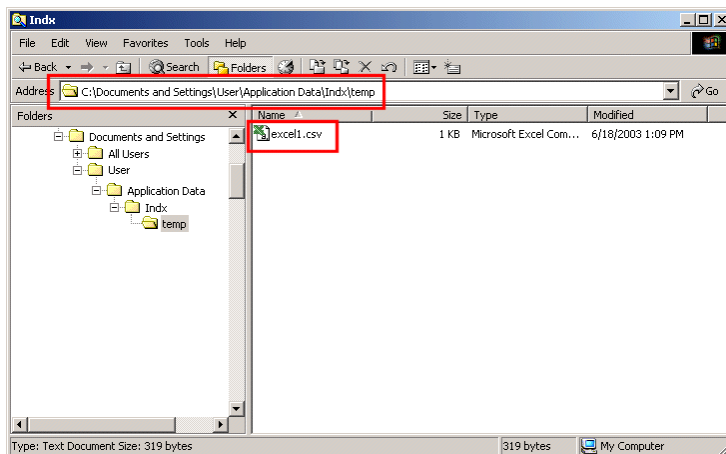
Two things happen when you select the Excel option:

1. A "temp" folder is created in the given **\Application Data\INDX** directory (only if this is the first instance that the Excel option is used) and a .CSV file is created.
2. Excel is opened.



If the Excel export data is too large, a pop-up message appears, stating that the requested data is too large.

The .CSV file is saved under **\Documents and Settings\<username>\Application Data\INDX\temp** directory, and is given a filename prefix of "excel" followed by a number. This number increases sequentially each time a .CSV file is created.



Excel .CSV file location



Once you close the XHQ Solution Viewer, all .CSV files *not in use* will be deleted. If a .CSV file is still in use by Excel after the XHQ Solution Viewer is closed, the file will not be deleted until the next Excel session and XHQ Solution Viewer termination. To save a file, you must rename it.

To launch Excel to view trend data

- Do one of the following to launch a XHQ Trend Viewer:
 - Point to a **value item** and right-click.
The shortcut menu appears.

or

 - Click on an **embedded view**.
- Click **Show Data**, and from the shortcut menu, click **Excel**.
Excel launches.

	A	B	C	D	E	F	G	H	I	J
	Pen Name	MySolution	realVal							
3	101.6383	04/02/03	16:10:00 PM	Good						
4	92.50766	04/02/03	16:10:05 PM	Good						
5	110.0981	04/02/03	16:10:15 PM	Good						
6	83.04193	04/02/03	16:10:25 PM	Good						
7	107.6636	04/02/03	16:10:35 PM	Good						
8	122.167	04/02/03	16:10:45 PM	Good						
9	151.4458	04/02/03	16:10:55 PM	Good						
10	168.0961	04/02/03	16:11:05 PM	Good						
11	159.313	04/02/03	16:11:15 PM	Good						
12	136.1039	04/02/03	16:11:25 PM	Good						
13	137.3041	04/02/03	16:11:35 PM	Good						
14	146.1579	04/02/03	16:11:45 PM	Good						
15	149.6899	04/02/03	16:11:55 PM	Good						
16	112.1803	04/02/03	16:12:05 PM	Good						
17	127.1034	04/02/03	16:12:15 PM	Good						
18	139.0441	04/02/03	16:12:25 PM	Good						
19	113.6783	04/02/03	16:12:35 PM	Good						
20	136.2552	04/02/03	16:12:45 PM	Good						
21	140.0633	04/02/03	16:12:55 PM	Good						
22	177.1187	04/02/03	16:13:05 PM	Good						
23	145.0659	04/02/03	16:13:15 PM	Good						
24	147.4047	04/02/03	16:13:25 PM	Good						
25	128.1542	04/02/03	16:13:35 PM	Good						
26	138.7723	04/02/03	16:13:45 PM	Good						
27	109.6992	04/02/03	16:13:55 PM	Good						
28	131.2016	04/02/03	16:14:05 PM	Good						