
GRID AUTOMATION PRODUCTS

MicroSCADA X SYS600 10.2

Historian Operation





Document ID: 1MRK 511 474-UEN
Issued: March 2021
Revision: A
Product version: 10.2

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Section 2 Introduction

2.1 This manual

This manual provides information on how to use the user interface of the SYS600 Historian. The user interface is called Vtrin.

2.2 Use of symbols

This publication includes warning, caution and information symbols where appropriate to point out safety-related or other important information. It also includes tips to point out useful hints to the reader. The corresponding symbols should be interpreted as follows:



Warning icon indicates the presence of a hazard which could result in personal injury.



Caution icon indicates important information or a warning related to the concept discussed in the text. It might indicate the presence of a hazard, which could result in corruption of software or damage to equipment/property.



Information icon alerts the reader to relevant factors and conditions.



Tip icon indicates advice on, for example, how to design a project or how to use a certain function.

Although warning hazards are related to personal injury, and caution hazards are associated with equipment or property damage, it should be understood that operation of damaged equipment could, under certain operational conditions, result in degraded process performance leading to personal injury or death. Therefore, comply fully with all warnings and caution notices.

2.3 Intended audience

This manual is intended for installation personnel, administrators and skilled operators to support installation of the software.

2.4 Related Documents

Name of the document	Document ID
SYS600 10.2 Historian Configuration and Administration	1MRK 511 472-UEN
SYS600 10.2 Historian Monitor Configuration	1MRK 511 473-UEN

2.5 Document conventions

The following conventions are used for the presentation of material:

- The words in names of screen elements (for example, the title in the title bar of a dialog, the label for a field of a dialog box) are initially capitalized.
- Capital letters are used for file names.
- Capital letters are used for the name of a keyboard key if it is labeled on the keyboard. For example, press the CTRL key. Although the Enter and Shift keys are not labeled they are written in capital letters, e.g. press ENTER.
- Lowercase letters are used for the name of a keyboard key that is not labeled on the keyboard. For example, the space bar, comma key and so on.
- Press CTRL+C indicates that the user must hold down the CTRL key while pressing the C key (in this case, to copy a selected object).
- Press ALT E C indicates that the user presses and releases each key in sequence (in this case, to copy a selected object).
- The names of push and toggle buttons are boldfaced. For example, click **OK**.
- The names of menus and menu items are boldfaced. For example, the **File** menu.
 - The following convention is used for menu operations: **Menu Name/Menu Item/Cascaded Menu Item**. For example: select **File/Open/New Project**.
 - The **Start** menu name always refers to the **Start** menu on the Windows Task Bar.
- System prompts/messages and user responses/input are shown in the Courier font. For example, if the user enters a value that is out of range, the following message is displayed: Entered value is not valid.
The user may be told to enter the string MIF349 in a field. The string is shown as follows in the procedure: MIF349
- Variables are shown using lowercase letters: sequence name

2.6 Document revisions

Revision	Version number	Date	History
A	10.2	31.03.2021	New document for SYS600 10.2

2.7 Definitions

Analog values	Numerical data representing continuously varying measured and calculated quantities. In contrast, digital values are usually either 0 or 1.
Data points	Points representing the values of database variables (current values or values retrieved from history) in chart window plots. A data point is always associated with a value, status (OK, invalid, etc.) and a time stamp.
Open chart window	To open a chart window, click its node icon or name in the tree. The tree can also be defined so that the display can only be opened with a double-click.
Digital values	Binary values representing device states. The basic states are set (on, valid, active, etc.) and reset (off, invalid, inactive, etc.).
Counter values	Numerical data representing measured and calculated quantities. The data is represented by integers.

Table continues on next page

Variables	Measurement points. Examples of (database) variables include the current flowing in a feeder and the position of the circuit breaker (open/closed).
Chart <ul style="list-style-type: none">• Chart area• Graph area• Plot area	A graph area in a chart window - Other terms in use.
Graph <ul style="list-style-type: none">• Item• Chart item• Trend• Plot• Variable item	Alternative term for the individual graph in the chart. - Other terms in use.

Section 3 Vtrin

Vtrin is the name of the SYS600 Historian visualization and engineering client.

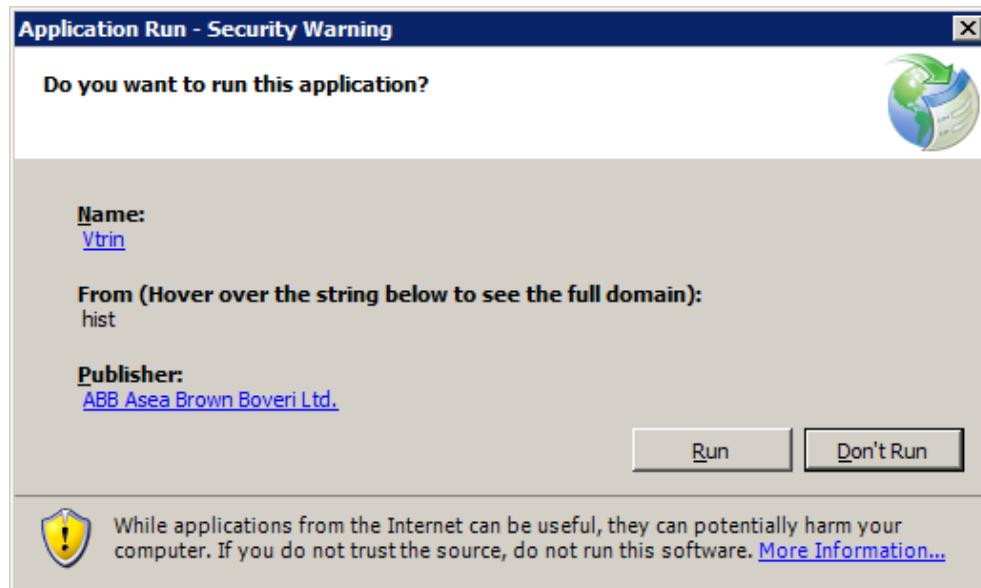
3.1 Logging on to the database

The database utilizes Microsoft ClickOnce technology to start the connection. ClickOnce is designed to work with Microsoft Internet Explorer, configuration details in Historian Configuration and Administration manual.

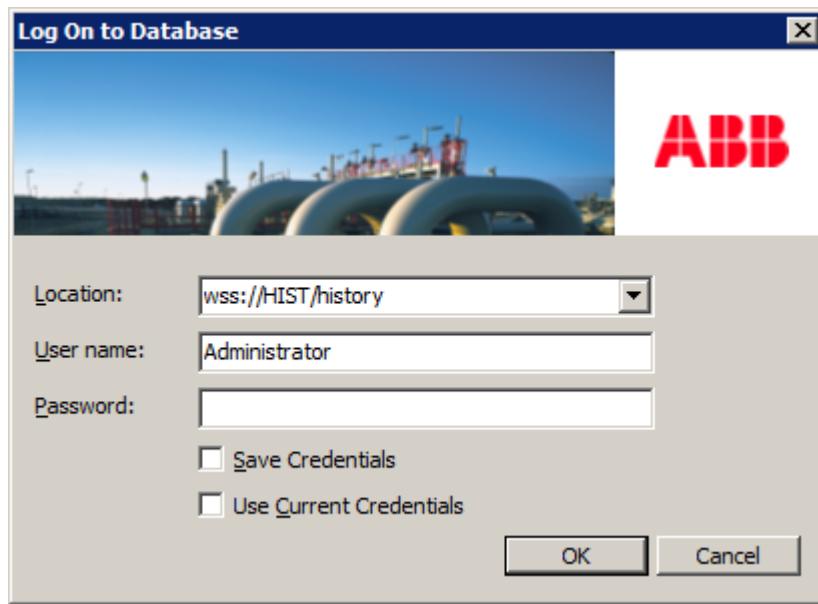
When connecting to a database that is located on the same machine, Vtrin can also be started directly by clicking the Vtrin application shortcut.

To connect to the database:

1. Go to <https://<Historian host>/vtrin>
2. If a security warning dialog is displayed, click **Run**.



The logon window opens:



3. In the location box, select the database (system) where to connect to. The database name consists of the name of the computer followed by history in the following format: wss://<host>/history.
4. Enter a user ID in the **User name** field and the corresponding password in the **Password** field.
5. The same credentials used for logging into Windows can be used for logging into Vtrin as well by selecting **Use Current Credentials**.
6. Connect by clicking **OK** or cancel the connection by clicking **Cancel**.

For a quick connection to the database, it is possible to create desktop shortcut pointing to the desired database address. Integration to the SYS600 Monitor Pro can be done by creating a custom menu command or toolbar button.

3.2 Vtrin Command line

Vtrin can be started using command line from the location C:\Program Files\ABB Oy\RTDB\Bin.

Usage: Vtrin[.exe] [parameters]

where parameters include one or more of the following:

-acceptnewserverkeys	Accept new server keys without confirmation from user.
-acceptserverkeychanges	Accept changed server keys without confirmation from user.
-alwaysacceptnewserverkeys	Always accept new server keys, even when connection initiated later time in the GUI.
-bounds <x,y,width,height OR minimized OR maximized OR fullscreen>	Sets bounds of a form, currently does not affect Vtrin main window.
-caption <text>	Specifies a custom caption for the main window.
-clockingthreshold	Specifies threshold for logging operations that took longer than expected in milliseconds.
-connectonly	Only tries connecting the given datasource and exits, error level 0 indicates success.

Table continues on next page

-contextinstance <classref>	Instance to pass as context parameters (eg. /Class/Path/MyPath1.MyPath2.MyPath3).
-contextdata <filename>	File containing serialized context data.
-controltarget <processid OR auto>	Target Vtrin process to control instead of spawning a new process.
-dsn <datasourcename>	Datasource name to connect to.
-debugtrace <filename>	Specifies that debugtrace should be dumped to given file.
-debugserver	Starts a Vtrin Server with configuration specified within Vtrin.exe.config within the same process for debugging purposes.
-form <form GUID or path>	Form path in tree or GUID to start.
-icon <filename>	Specifies a custom icon for the main window.
-lockdsn	Disables dsn modification in the login box.
-parentwindow <hWnd>	Parentwindow for Vtrin for subclassing.
-pass <password>	Password to use for connecting.
-rejectnewserverkeys	Reject new server keys without confirmation from user.
-rejectserverkeychanges	Reject changed server keys without confirmation from user.
-screen-copy <filename>	Command Vtrin to get screenshot of the form specified by -form parameter. If you start the filename with @, the filename will be treated as a list file specifying list of forms to take screenshots from (every line in the file should contain, form filename pair, eg. Maintenance/Variables variables.jpg).
-server	Specifies that Vtrin should run as server (only for debugging!).
-swallowcontrol	Use together with parentwindow to forces Vtrin to handle swallowing by itself (although parent app should normally do it!).
-user <username>	Username to use for connecting.

Example: Vtrin -dsn wss://Taikaviitta/history -user guest -bounds maximized -form "Forecasts/Paper Machine 1"

3.3 Log off from Vtrin

Click the **Close** button on Vtrin's title bar or **Exit** from the **Database** menu.

When logging off from Vtrin, the user will be prompted to save the changes in each open window.

Section 4 Workspace

The workspace for Vtrin user interface displays the following elements:

Title bar	Window's heading
Menu bar	See Section 4.1
Tree window	See Section 4.5 and Section 4.7
Tab	See Section 4.9
Custom toolbar	See Section 4.3
Toolbar	See Section 4.2
Properties dialog	See Section 4.6
Window area	See Section 4.9
Role-specific views	See Section 4.10
Status bar	See Section 4.4

The most common icons in Vtrin are presented in [Section 4.11](#).

4.1 Menu bar

The menu bar is located under the title bar. It includes the following Vtrin menus:

Database	See Section 4.1.1
View	See Section 4.1.2
Window	See Section 4.1.3
Help	See Section 4.1.4

4.1.1 Database menu

The **Database** menu for the Vtrin user interface contains the following elements:

Menu Term	Description
Connect to...	Opens a connection to another database. This displays a logon window as described in Section 3 logging on/connecting to the database.
Save	Saves the active window in the directory tree, if the window properties have been changed.
Save copy as	Saves the active window in the selected directory in the directory tree under the selected name.
Page Setup	Sets the page settings for printing. For further information, see Windows help.
Print Preview	Allows the user to preview the page before printing. For further information, see Windows help.
Print...	Opens the Print... dialog that allows the user to print the content of the active window to the selected printer. For further information, see Windows help.
Exit	Closes Vtrin. See also Section 3 , Log off from Vtrin.

4.1.2 View menu

The **View** menu for Vtrin user interface contains the following elements:

Menu Term	Description
Toolbar	Displays the toolbar by default under the menu bar, see Section 4.2 . Selected by default.
Custom Toolbar	Displays the custom toolbar by default under the Vtrin toolbar, see Section 4.3 . Selected by default. The user can change the order of the toolbars or put them in one row.
Status Bar	Displays the status bar at the bottom of Vtrin, see Section 4.4 . Selected by default.
Tree	Displays the tree in the Tree window, see Section 4.4 . Selected by default.
Properties	Displays the Properties dialog, see Section 4.6 . Selected by default.
Full Screen	Switches Vtrin to full screen, leaving only the menu bar and window area (including tabs) visible. To return to the normal view, click the command or button again.
Save Layout	Saves the workspace layout.
Locked	Locks the appearance of the workspace, meaning that the relative relationships of the windows can no longer be changed. If the relative relationships is changed after unlocking, the Tree window and Properties dialog, for example, will remember their new size the next time they are opened.
Refresh	Refreshes the active window. The active window can also be refreshed by pressing the F5 shortcut key for Refresh.

4.1.3 Window menu

The commands in the **Window** menu affect the active window. See also [Section 4.9](#). Only the commands available for the active window are displayed in bold.

Menu Term	Description
Move to a New Horizontal Leaf	Moves the active window to a new horizontal leaf.
Move to a New Vertical Leaf	Moves the active window to a new vertical leaf.
Move to the Next Leaf	Moves the active window to the next leaf.
Move to the Previous Leaf	Moves the active window to the previous leaf.

4.1.4 Help menu

The **Help** menu for Vtrin user interface contains the following elements:

Menu Term	Description
Contents...	Not yet supported.
Index...	Not yet supported.
Search...	Not yet supported.
User's Reference Manual	Opens this manual on screen.
About Vtrin	Displays the version of Vtrin. Click OK to continue.

4.2 Toolbar

By default, the Vtrin toolbar is located below the menu bar.

Toolbar button	Description
Back	Steps backward through the window call path activating the previous window. See Section 4.8 .
Forward	Steps forward through the window call path activating the following window. See Section 4.8 .
Refresh	Refreshes the active window. The active window can also be refreshed by pressing the F5 shortcut key for Refresh.
Tree	Shows/hides the Tree window. See Section 4.5 and Section 4.7
Properties	Shows/hides the Properties dialog box. See Section 4.6 and Section 4.7
Print	Opens the Print dialog that allows the user to print the content of the active window to the selected printer. For further information, see Windows help.
Full Screen	Enlarges Vtrin to full screen, leaving only the menu bar and window area visible. To return to the normal view, click the button again.

4.3 Custom toolbar

The custom toolbar is located below the Vtrin toolbar. It can also be move to the Vtrin toolbar, or the toolbar order can be changed.



Custom toolbar	User-specific: each user can customize a toolbar according to their needs. The customized toolbar will be displayed whenever the user connects to the database. It is a good idea to place frequently used windows as buttons in this toolbar. The windows can then be easily opened by clicking the appropriate buttons instead of having to locate the windows in the tree.
Toolbar	See Section 4.2

4.3.1 Adding, editing and deleting custom toolbar buttons

To add a button to the custom toolbar:

- Drag the window icon from the tree to the custom toolbar. The new button will appear on the right on the custom toolbar.

To delete a button:

- To delete a button, right-click the button and select **Remove** from the drop-down menu.

4.4 Status bar

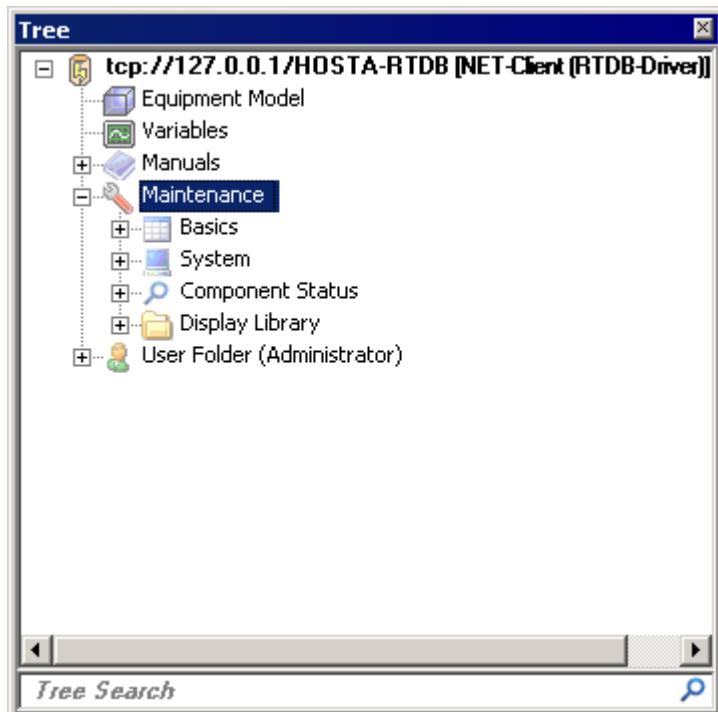
The status bar is displayed at the bottom of Vtrin.



The time on the user's PC is indicated by the () icon and the time on the server by the () icon at the right-hand end of the bar.

4.5 Tree window

The Tree window displays the system's windows (charts) in a hierarchical tree structure.



The tree contains folders, which in turn include subfolders and windows. The windows display lists, tables, charts, process diagrams and reports.

The procedures for opening and closing the Tree window, as well as moving it within the workspace, are described in [Section 4.7](#).

Administration and maintenance of the tree are described in the Historian Monitor Configuration manual.

4.5.1 Opening folders and windows

To make the tree fully visible:

- If the tree is not fully visible, open it by clicking next to the database icon, by clicking the icon itself or by clicking the database name.

To open a folder:

- Click the plus sign next to the folder or the folder name. The symbol next to an open folder changes into a minus sign when the folder is opened.

To close an open folder:

- Click the minus sign or double-click the icon or the folder name.
- Open a window by clicking its node icon or name.

Menu term	Description
Open	Corresponds to opening a window in the tree. The command is not available for folders.
New Tree Item	See the SYS600 Historian Monitor Configuration manual.
Copy	See the SYS600 Historian Monitor Configuration manual.
Paste	See the SYS600 Historian Monitor Configuration manual.
Delete	See the SYS600 Historian Monitor Configuration manual.
Rename	Opens up the window name field for editing. Changing the name of the window in the tree also changes the name visible in the Window tab. In case of a trend, the default title of the trend is also changed. If the trend title is edited separately, changes in the window name field do not affect the edited title.
Properties...	See the SYS600 Historian Monitor Configuration manual.

In some cases, the window is defined in such a way that right-clicking it displays the following menu. The windows shown in the menu can be opened by clicking them.

Display a ToolTip by placing the cursor on a folder or a window. ToolTip includes additional information on the selected item, if the information has been defined.

4.5.2 Setting the root of the Tree window

Inside the tree, any folder with content can be set to act as the root of the tree structure. This cleans up the tree view for the user. Any unnecessary information, tree folders and nodes, can be hidden from the user. All folders above or on the same level with the selected folder are hidden leaving only the contents of the new root folder visible. The new root folder is set by selecting **Set as Root** from the pop-up menu of the desired folder.

Menu item	Description
Set as Root	Sets the folder to act as a root of the tree. Only the contents of the folder are left visible.

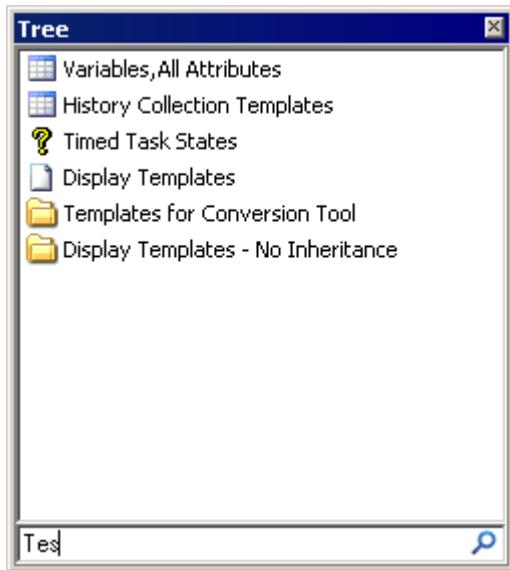
The whole tree structure can be retrieved by selecting **Reset Root** from the pop-up menu of newly set root folder.

Menu item	Description
Reset Root	Restores the whole tree structure with the original root folder.  The expansion state of the tree is not restored after the root has been reset. All folders are collapsed.

4.5.3 Searching in the Tree window

Search for items matching the wanted criteria inside the Tree window. Items are found based on the names of the nodes. The search is started by clicking the Tree Search field under the Tree window.

Typing in the first letters narrows down the items visible in the tree.



Any item names matching the search criteria are left visible in the Tree window, while others are hidden. Entering a longer or a more descriptive search phrase narrows down the visible items even more. If no item matches the criteria, the tree is left empty. All items in the tree are retrieved by erasing the writing in the Tree Search field.

The tree search is case insensitive and uses partial matching criteria. So, for example, entering a single letter "T" in the search field returns a tree with all the items containing "t" or "T" somewhere in the item name. Furthermore, the search phrase "Trend - avg" returns different results from "avg - Trend". This is because the whole search phrase is searched for, not a name containing all the words in the search phrase.

4.6 Properties dialog

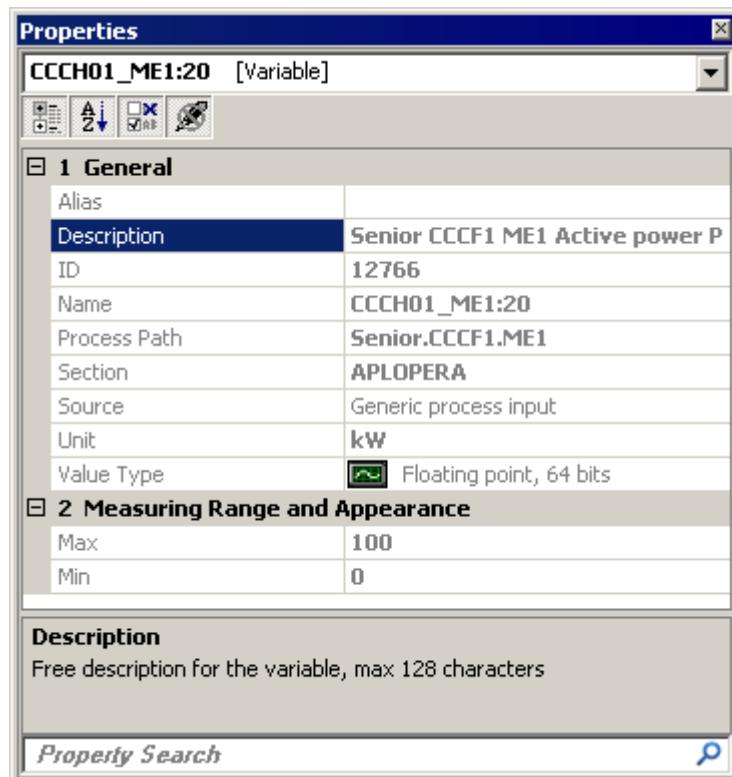
Properties dialog box (see below) displays the properties of a selected element of certain kinds of windows in the window area. The data of a variable selected can be viewed from the variable list in a database table. The same information can also be viewed in the variable list, but the **Properties** dialog box groups the data of a single variable in a vertical list while also providing an explanation for the data.



Properties dialog is not visible by default for roles: Engineer and User

For information on how to display the **Properties** dialog box and change its location, see [Section 4.7](#).

The way to choose an element in a window and display its properties in the **Properties** dialog box depends on the type of window. For example, to view the properties of a list item in the **Properties** dialog box, click the item in the first column of the list.



Properties	Clicking a row in the Properties dialog box shows a description of the property in question at the bottom of the window.
------------	--

Clicking the buttons at the top of the window allows the user to select or deselect a data display option. When an option is selected, the button is displayed in white (for example,



). When an option is deselected, the button is displayed in the same color as the background (for example, ).

For more detailed information, see [Section 6](#).

4.6.1 Searching in the Properties dialog

The **Properties** dialog has a similar search tool as the Tree window.

The search tool is located under the **Properties** dialog and acts as the search tool for the Tree window. The property search retrieves properties whose names (first column on the list) match the search criteria and shows them on the property list. See [Section 4.5.3](#) for more details about using the search tool.

4.7 Opening and closing the Tree window and the Properties dialog

The Tree window and the **Properties** dialog box are located in their own area on the left side of the workspace. The windows can be placed on top of each other as tabs, the names of which will be displayed at the bottom of the area. Each shown window have their own tabs, see [Section 4.9](#). They can also be detached and displayed as individual windows or minimized into

icons. The following sections provide a more detailed description of the handling of the Tree window and the **Properties** dialog box.

4.7.1 Opening the Tree window and the Properties dialog

Choose **Tree/Properties** from the **View** menu or click the toolbar button **Tree/Properties**.

4.7.2 Closing the Tree window and the Properties dialog

Choose **Tree/Properties** from the **View** menu or click the toolbar button **Tree/Properties**. The dialog can also be closed directly by clicking the **Close** button in the dialog's title bar.

4.7.3 Quickly enlarging and reducing the Tree window and the Properties dialog

- To make the window cover the area of both the Tree window and the Properties dialog, click  in the title bar.
- To restore the window to its normal size, click  in the title bar.

4.7.4 Detaching the Tree window and the Properties dialog

To detach a window:

- Drag it from its title bar or double-click the title bar. A detached window can be freely resized and moved anywhere on the Windows desktop.

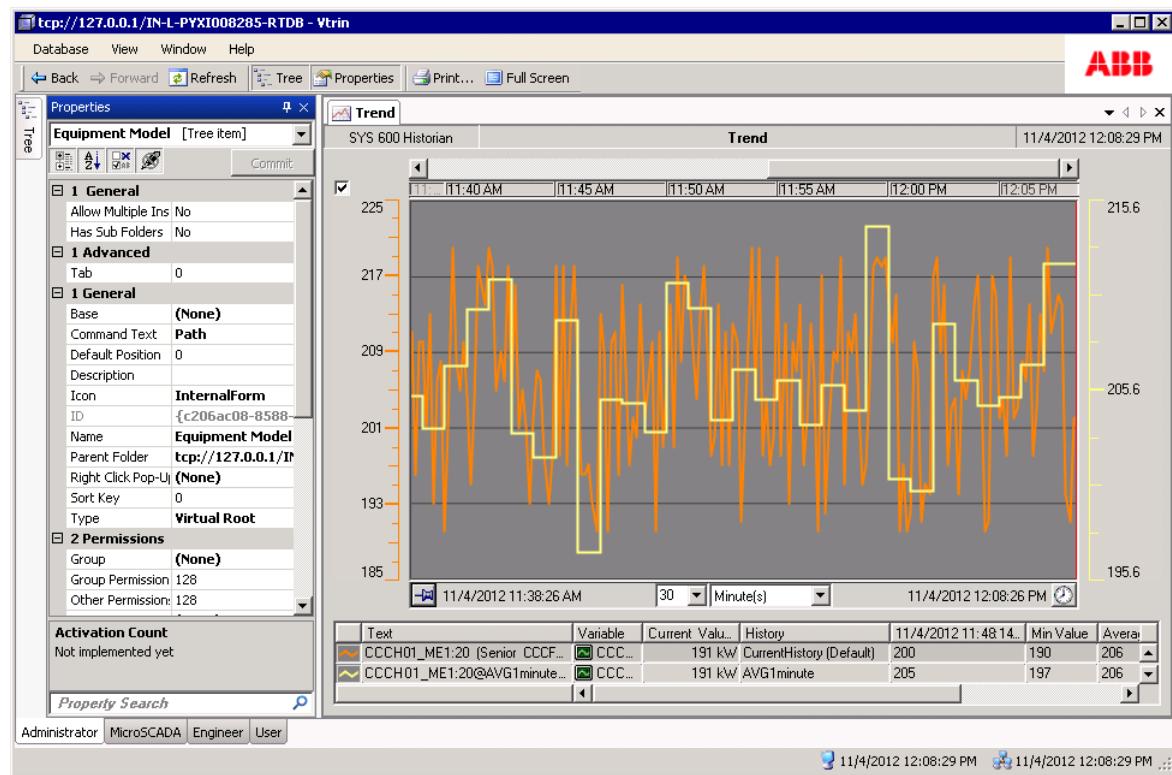
To restore the window to its previous fixed location:

- Double-click the title bar.

4.7.5 Reducing the Tree window and the Properties dialog into icons on the vertical bar

To reduce the window into an icon on the vertical bar:

- Click the title bar button .



Tree Window as an icon

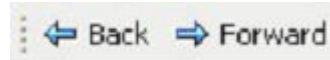
Shows the window. If the window does not open as shown in the following figure, widen Vtrin on the screen. To position the window back on the bar, click anywhere outside the window.

To restore the window to its location:

- Click or point to a Tree icon on the vertical bar and then click in the title bar. When the button is clicked, it is displayed in the active color, as is the title bar of the window.
- If the window does not open from the bar, widen Vtrin on the screen.

4.8 Moving back and forward in the browser history

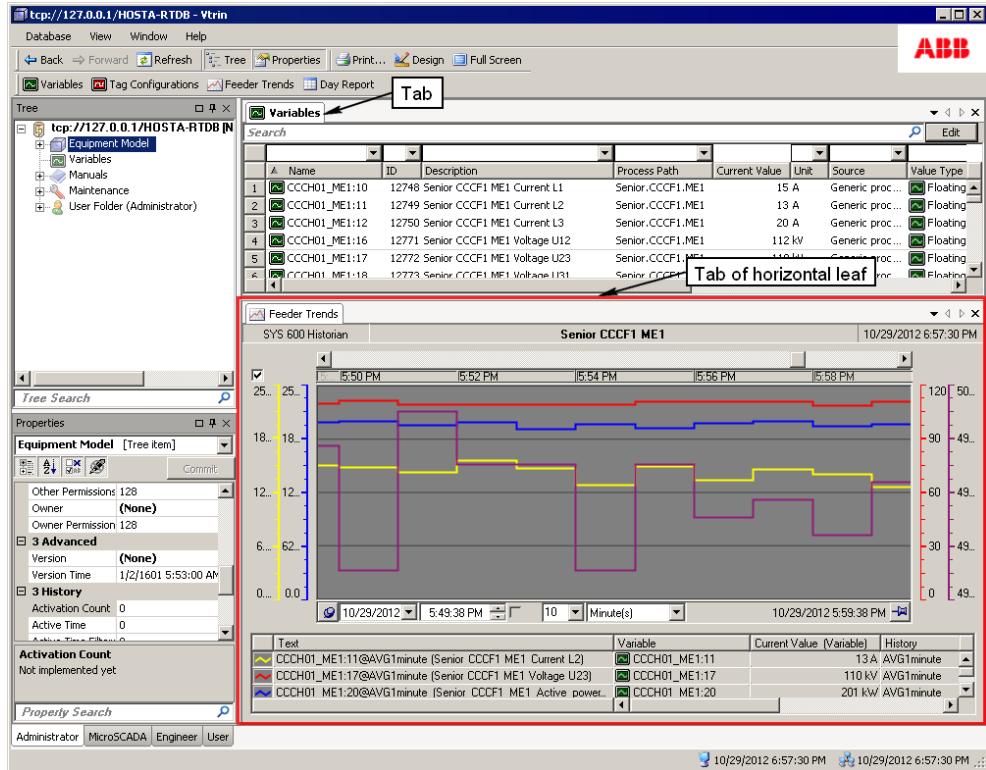
The Tree window can be browsed back and forth similarly to how, for example, folders are browsed in Windows file explorer or web pages are browsed with a web browser. Visited folders and nodes in the tree are accessible with the **Back** and **Forward** browsing buttons. The window tabs visited in the window area are also retrievable in the order they were accessed.



The state of the tree is restored to corresponding state when browsing in the browser history. The state of the tree means e.g. folders that have been expanded or collapsed while accessing different nodes. When the latest step of the browser history is accessed, the **Forward** button is dimmed.

4.9 Window area

The charts in the tree are displayed in the window area. By default, they open on top of each other in the size of the full area. The titles of the windows are displayed in tabs at the top of the area.



Click the selected tab to activate a window and to display it on top.

4.9.1 Adjusting window placement and docking

To view more than one window at the same time, position the windows in multiple horizontal and/or vertical tabs.

Vtrin can display horizontal and vertical leafs, each with its own tab at the top of the area. In the previous figure there are two horizontal leafs, the lower of the two leafs marked with a red rectangle.

The window placement and docking can be changed either via the **Window** menu or via the window tab pop-up list. The list can be accessed by right-clicking the **Window** tab.

Using the **Window** menu:

To move the active window to a new tab of horizontal (vertical) leaf:

- Choose **Move to a New Horizontal Leaf** (**Move to a New Vertical Leaf**) from the **Window** menu. Other windows are also ordered in horizontal (vertical) tab groups.

To move the active window to the following (previous) horizontal or vertical tab:

- Choose **Move to the Next Leaf** (**Move to the Previous Leaf**) from the **Window** menu.

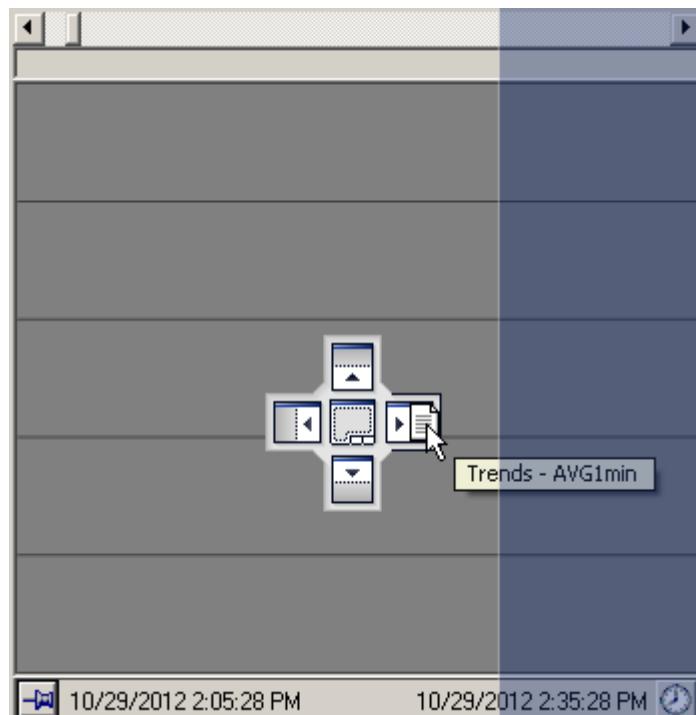
Using the window tab pop-up list:

Menu term	Description
Close	Closes the current window.
Close All But This	Closes all other windows excluding the current one.
Prominent	Shows only the current window on the whole window area. The tabs in the same tab group will be left visible, whereas other tab groups are hidden. All tab groups are restored when Prominent selection is deactivated.
Rebalance	Resizes all visible windows. The window sizes are set equal within all rows and within all columns.
New Horizontal Tab Group	Creates a new horizontal tab group for the selected window. If the current tab group is horizontal, a new tab group will be created under the current group. If the current tab group is vertical, the tab group will be created inside the current window area, which will be horizontally split in two.
New Vertical Tab Group	Creates a new vertical tab group for the selected window. If the current tab group is vertical, a new tab group will be created beside the current group. If the current tab group is horizontal, the tab group will be created inside the current window area, which will be vertically split in two.
Move To Next Tab Group	Moves the window to the next tab group. If there are no more windows left in the former tab group it will be dismissed.
Move To Previous Tab Group	Moves the window to the previous tab group. If there are no more windows left in the former tab group it will be dismissed.

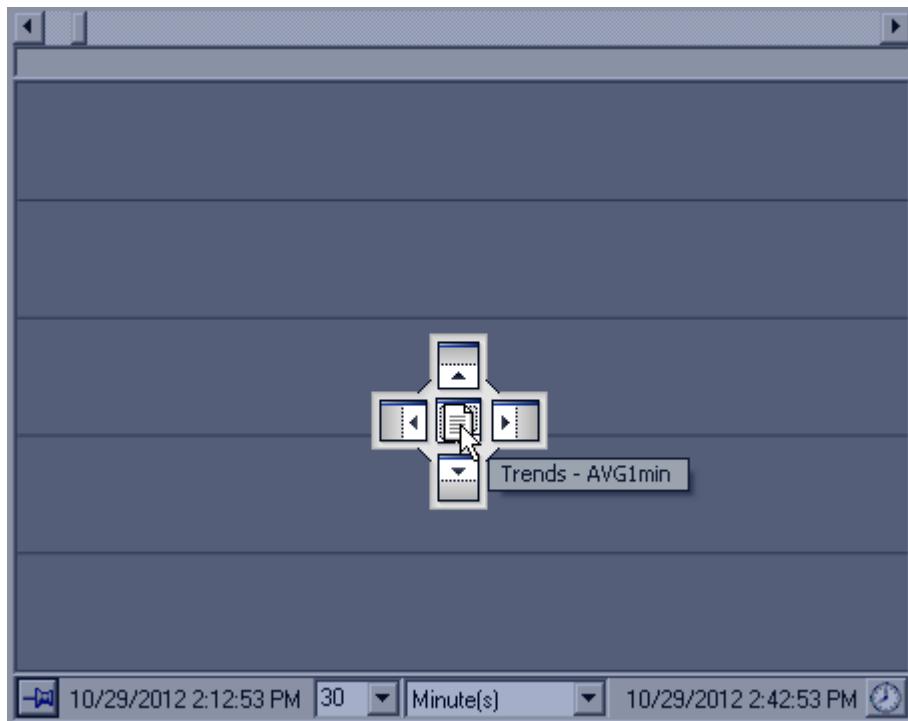
4.9.2

Changing window placement with drag and drop

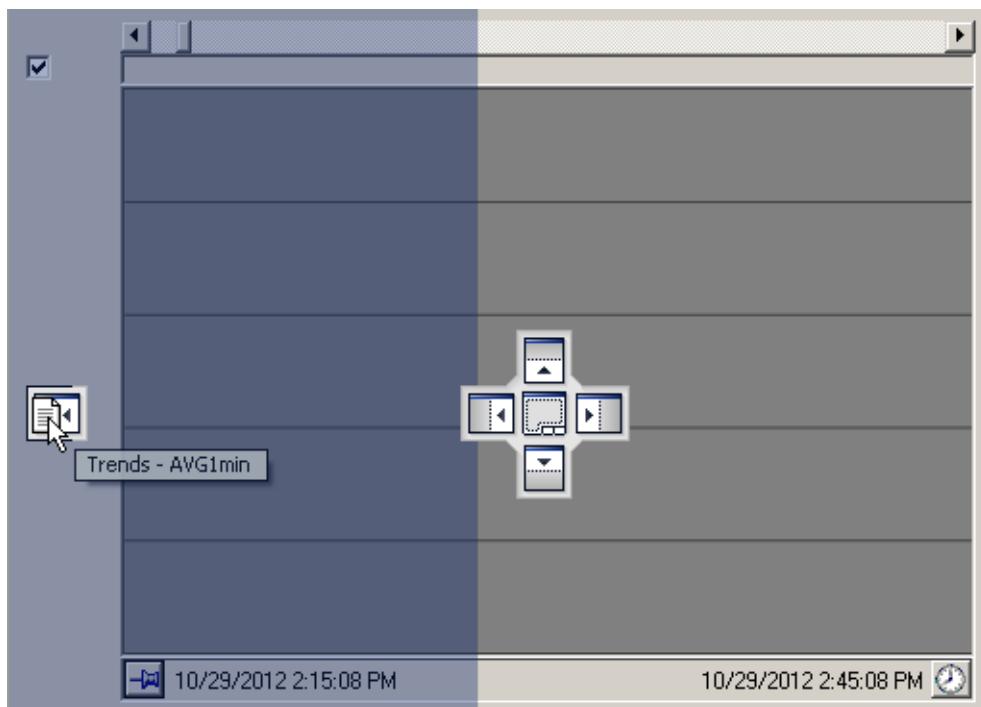
Any window can moved to another position on the window area by dragging it from the window tab. Place the mouse cursor on top of the window tab and move the mouse while holding down the primary mouse button. A docking helper will appear in the middle of the current view area.



The figure above shows the docking helper, which is used to set a window to a new position. If the window is dropped on top of any of the four directional white rectangles, the dragged window will be placed inside the target window area. The target window area will then be split between the two windows in the desired direction and order.



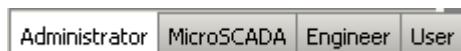
If dropped to the center area of the docking helper, the dragged window will consume the whole target window area and the replaced window will be hidden under a tab.



Any window can also be moved into a new tab group. This is achieved by dropping the window onto any of the four docking helper rectangles on the far sides of the window area. A new tab group is created to the corresponding half of the window area with the contents of the dropped window.

4.10 Roles

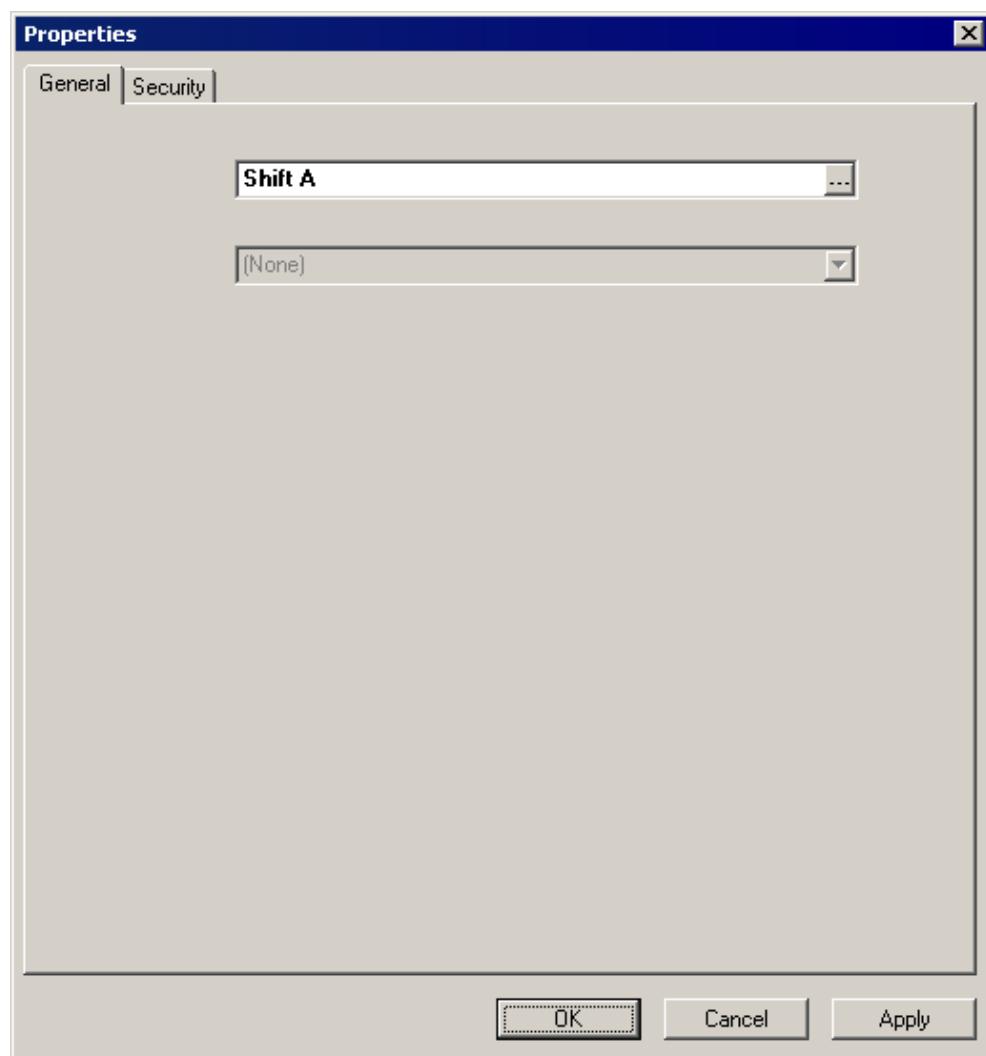
Roles are used for storing the state of the workspace for different users or roles. The state includes the selection of visible displays as well as their mutual positioning on the screen. A role can be, for example, an Engineer role or a User/operator role describing the tasks intended for certain group of users. Each role can be accessed via the role tab in the lower left corner of the screen.



To create a new role, click on an existing role tab with the secondary mouse button and select **New Role** from the pop-up menu. A dialog will appear prompting for a name for the new role.



To create New Role or Delete Role, logon as Administrator.



Enter the new role name into the field and click **OK**. A new role tab will appear in the lower left corner with the name provided. Clicking the tab opens an empty window area. New content can now be added for the new role.



Remember to save the layout of the role once it has been defined it. The layout is saved with the **Save Layout** command found in the View menu.

Any changes in the role's layout can be stored as the default layout for the role using the **Save Layout** command. If the command is not taken, the default layout won't be changed and it will be used the next time the role is accessed after Vtrin is restarted.

To delete a role, right-click the role and select **Delete Role** from the pop-up menu. This erases the layout associated with the role and removes the role tab.

4.11 Icons

The icons of the variables indicate the variable type. Icons are used, for example, in the variable's Status window. The following icons are used for variables:

Variable icons

Icon	Description
	Floating-point variable
	Binary variable
	Integer variable
	Text Variable

The status icons and colors indicate the status of the variable's current value. The icons and colors, as well as the icons depicting the direction of values, are shown in the following table.

Status icons, status colors and icons for the direction of values

Icon	Description	Color
	A warning for the variable	Yellow
	A notification for the variable	White
	Invalid value	Magenta
	Questionable value	Violet
	Value substituted	Blue
	Value OK	Green
	Manually entered	
	Invalid source (reason for the invalid or substituted value)	
	Handling blocked (reason for the invalid or substituted value)	

Table continues on next page

Icon	Description	Color
↗	An increasing value, used in the variable's Status window	
↘	A decreasing value, used in the variable's Status window	
→	A static value, used in the variable's Status window	

The chart items icons indicate the item type. They are used in the chart legend and in the Properties dialog for chart items.



Chart items icons include the following:

Chart item icons

Icon	Description
Line, trend	Line, trend
Area	Icon for area plots. The color of the symbol in the icon corresponds to that of the area and/or data point markers. The data point marker color is selectable.
Stacked area	Icon for stacked area plots. The color of the symbol in the icon corresponds to that of the area and/or data point markers.
Stacked column	Icon for stacked column series. The color of the icon corresponds to that of the columns.
Stacked column, sorted	Icon for sorted stacked column series. The color of the icon corresponds to that of the columns.
Stacked column, application status	Stacked column where the column color is based on application status. If application status is not available, the column color corresponds to that of the icon.
Application status	Defines the color corresponding to application status.
Gantt	Icon for Gantt charts. The color of the icon corresponds to that of the Gantt chart if no color condition has been defined or the condition is not fulfilled.
Gantt, status and color	The color of a Gantt chart component when the color condition is fulfilled.
Line, XY scatter	Icon for XY plots. The color of the symbol in the icon corresponds to that of the chart and/or data point markers. The data point marker color is selectable.
Info	Icon for text rows. The icon background color is selectable.
Table continues on next page	

Icon	Description
	Icon for separator rows. The icon color is fixed.
	Marker icon. The marker for the data points is used as the icon and its color corresponds to that of the data points.
	Shows that an error occurred when fetching chart item data.

Other icons used in Vtrin:

Other icons

Icon	Description
	Vtrin
	User's PC
	Server
	Icon for the free start and end time of an interval, used, for example, in charts. Click the icon to lock the time.
	Icon for the locked start and end time of an interval, used, for example, in charts. Click the icon to unlock the time.
	Icon for the updated end time of a time span, used, for example, in charts. Click the icon to lock the time. The time changes into an updated pin by double-clicking.
	Iconizes the window that is displayed with the cursor. Closes the window.
	Closes the window.

The shape of the cursor depends on the task and, in the chart area, also on the user's selections:

Cursor icons

Icon	Description
	Cursor displayed in normal situations when the mouse is moved or pointed at, for example, a current value or graph in charts. (Arrow selected)
	Cursor displayed in normal situations when the mouse is moved or pointed at, for example, a current value or graph in charts. (Arrow and crosshair selected)
	Cursor displayed in normal situations when the mouse is moved or pointed at, for example, a current value or graph in charts. (Crosshair selected)
	Cursor displayed when the mouse is pointed at a link in a chart.

Table continues on next page

Icon	Description
	Cursor displayed when an item is copied or moved by dragging.
	Cursor displayed when an item is dragged over an area where it cannot be dropped.
	Cursor displayed when the size of different areas on the screen is changed.

Section 5 Charts

The graphical information in Vtrin displays is shown in charts. Charts can contain a multitude of various graphical elements, such as pictures, graphs, plots, value controls, text blocks etc.

This section describes the various properties of the chart display on a trend display template.

5.1 Description

This describes the features of the chart shown under **Chart window**. All charts do not include all of the properties described here. The properties may also be located in different parts of the window.

Charts are usually located in application specific tree folders. To open the chart window, click on its icon or the name of the tree node.

The chart window described here has the following parts:

- a tab
- a title bar
- a time scroll bar
- a time ruler
- scaling limits
- a plot area
- an interval row
- a legend

The tab displays the name of the chart window. When the mouse cursor is brought over the name, the program displays a ToolTip that shows the location database of the chart and its call path. A **Close** button with which the active chart window can be closed is located at the right end of the tab row. The title bar of the chart window shows the company/department name, the chart title, as well as the current date and time. The chart author specifies the company/department name and the diagram title.

The plot area displays different kinds of trends and column graphs.

The legend contains rows displaying information about the variables on the plot area. It may also contain text and separator rows.

The scaling limits show the upper and lower limits of the graphs in the plot area.

5.2 Chart window

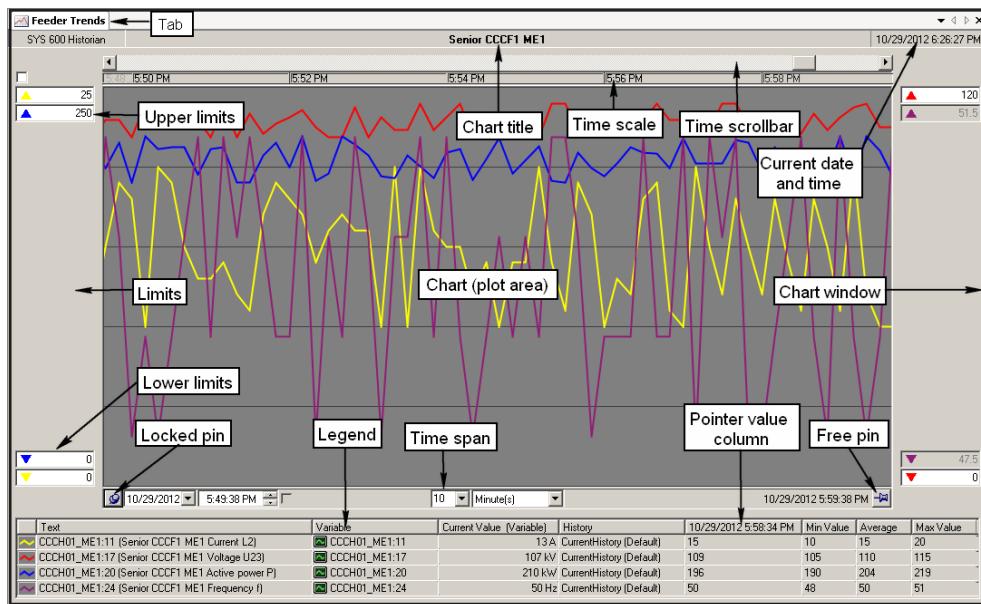


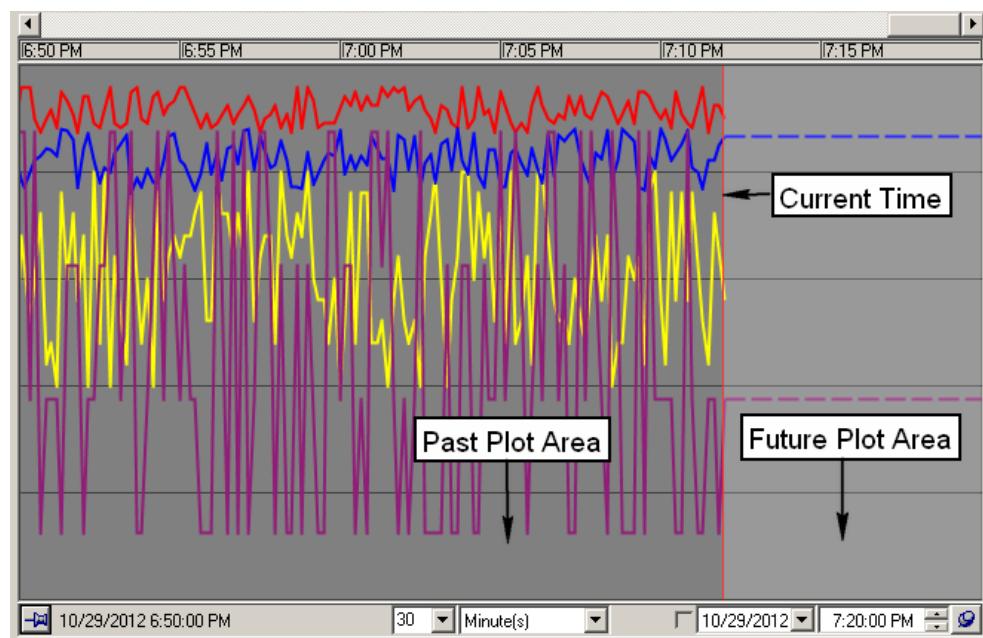
Chart window terms	For more information, see the following explanation or see the following section.
Tab	The text displays the name of the chart.
Plot area	See Section 5.3
Chart title	The default title of the chart window is the name the chart has in the tree. The name can be edited in the title area, if the user has sufficient rights.
Time ruler	See Section 5.9
Time scrollbar	See Section 5.8
Current date and time	
Upper scaling limits	See Section 5.6
Scaling limits	See Section 5.6
Lower scaling limits	See Section 5.6
Locked pin	See Section 5.7
Legend	See Section 5.4
Time bar	See Section 5.7
Time span	See Section 5.7
Pointer value column	See Section 4.6
Free pin	See Section 5.7

5.3 Plot area

The plot area displays the graphs of variables, such as line plots, area plots and column series, usually as a function of time.

5.3.1 Description

The plot area is located below the time scroll bar and the time ruler. A chart window may contain more than one plot area.



The plot area above is divided into history and future time areas, with the red line denoting the present time. A plot area may also be limited for showing the history or future time only.

To view the values of the graph, place the pointer over the graph. The ToolTip box shows the value, time stamp and status of the data point closest on the left from the pointer (see [Section 5.3.2](#)).

Moving the pointer in the plot area displays the time and all the calculated values of line and area plots in the pointer's location. The Pointer Value column must be selected in the legend to see the value (see [Section 5.3.4](#)).

Use zoom to view a certain part of the time span in more detail. Zooming in moves the left side of the selected time span to the left side of the plot area and the right side of the time span to the right of the plot area. Zoom in can be used repeatedly.

Zooming out cancels the effects of zooming in, step by step. To return to the original view, the view must be zoomed out as many times as it was zoomed in.

It is also possible to view a summary of plot values, view trend values, zoom the plot area, copy data to the clipboard and change the chart format to list or to graph through the chart pop-up.



Only those options that are possible for the selection are active in the pop-up menu.

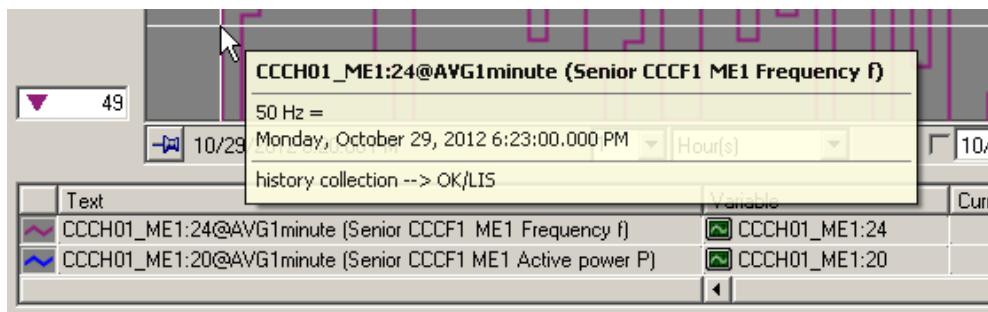
Menu term	For more information, see the following explanation or see the following section.
Zoom In	See Section 5.3.5 .
Zoom Out	See Section 5.3.6 .
Summary	See Section 5.3.3 .

Table continues on next page

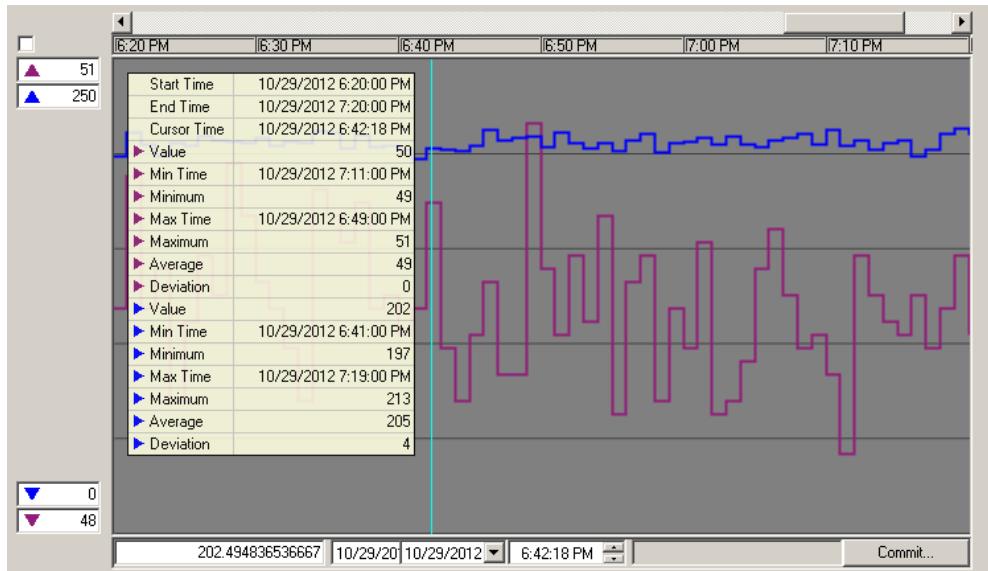
Menu term	For more information, see the following explanation or see the following section.
Execute	Startup of applications defined in the system.
Recalculate	Startup of applications defined in the system.
Copy Data to Clipboard	See Section 5.3.7 .
To List	Changes the chart from a graph to a list format. See Section 5.3.8 .
To Graph	Changes the chart from a list to a graph format. See Section 5.3.8 .
Properties...	Open chart definitions, see SYS600 Historian Monitor Configuration manual.

5.3.2 Viewing the value of the graph in the ToolTip box

Point to a part of the graph and wait for a moment. A ToolTip showing the content of the legend text column (usually a description of the variable) and the unit of the variable, as well as the retrieved history data (value, time and status) is displayed next to the cursor. History data is the data of the data point closest on the left from the cursor.



5.3.3 Viewing summary values



Click the mouse at the desired location in the plot area. A turquoise vertical trend value line is displayed in the location of the pointer. Its location is fixed in relation to the plots and it moves with the plots when they are refreshed.



Cursor time and value rows are refreshed automatically by clicking the mouse. Start time, End time, Minimum etc., however, are caught from the data when the display is called or when the data is re-fetched by command. Thus they are not automatically refreshed.

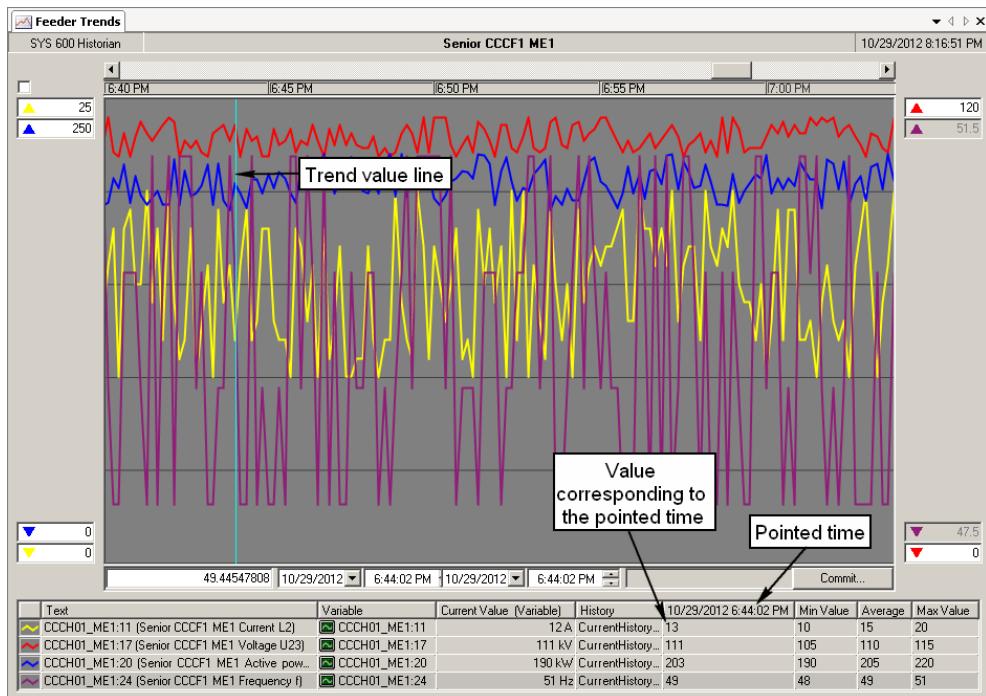
Summary term	Description
Summary	Right-click in the plot area and choose Summary from the pop-up menu. The window shown above will open. It shows plot values at the trend value line for all plots on the screen, as well as the minimum, average, maximum and deviation values calculated from the plot points.
Start time	Start time from the display call.
End time	End time from the display call.
Cursor time	Time corresponding to the desired location.
Value	Value corresponding to the desired location.
Minimum	Minimum during the time span between the start and end time.
Maximum	Maximum during the time span between the start and end time.
Average	Average during the time span between the start and end time.
Deviation	Deviation during the time span between the start and end time.

5.3.4 Viewing trend values

1. Place the cursor in the plot area and move it so that the vertical line of the crosshair pointer (assuming that the crosshair has been selected in the chart window) is in the wanted spot. The location of the horizontal line is unimportant.
2. Click the mouse. A turquoise vertical trend value line is displayed in the location of the cursor. Its location is fixed in relation to the plots and it moves with the plots when they are refreshed. The time and values in the legend do not follow the cursor's movements, but instead show the data pertaining to the selected point.
Clicking anywhere in the plot area will make the trend value line disappear. The data in the legend will start following the cursor movements again.
3. Clicking the plot area again will display a new trend value line with time and variable values.

Viewing trend values in variable value points using arrow keys:

1. Select a variable from the legend.
2. Click on the chart to select time. A turquoise vertical line appears indicating the selection.
3. Left and right arrow keys move the turquoise line from one value point to another showing new trend value and time for each point.

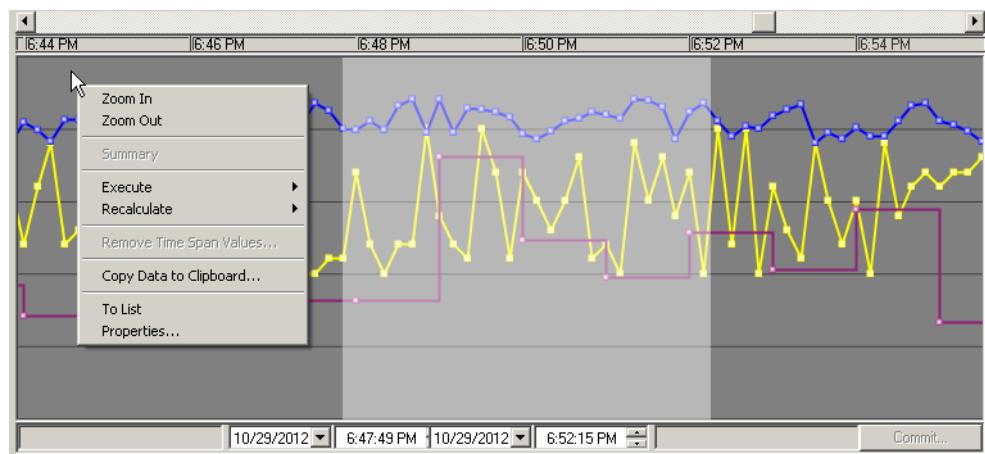


Display Term	Description
Trend value line	The trend value line shows the values corresponding to the selected time.
Pointed time	The column shows the values corresponding to the selected time.
Value corresponding to the pointed time	The column shows the value at the time of the selected trend value line. If the line has not been selected, it shows the value at the time that the cursor points to.

5.3.5 Zoom in

To define the zoom in the area:

1. Place the cursor in the plot area, move it to the left side of the area, press the mouse button down and hold it down.
2. Hold the mouse button down and drag the cursor to the right side of the selected area. The selected area is highlighted.
3. Release the mouse button.
If the text boxes displayed on the time span row show the start and end time of the selected area, the history update bar has been defined and the start and end times can be changed.
4. Right-click the plot area and choose **Zoom in** from the pop-up menu. The selected time span now fills the entire plot area. The time span is locked, the pins are pushed down, and the interval and curves are no longer refreshed.



In order to refine the selection, the start and end times in the boxes can be modified. The highlighted area will change accordingly.

5.3.6 Zoom out

1. Right-click the plot area and choose **Zoom out**.
2. The Zoom Out command can be selected as long as the number of zoom in commands is larger than the number of zoom out commands. To return to the original state, zoom out until the Zoom Out command is disabled.
3. Release the time span by clicking the pin buttons. This re-enables the refreshing of the time span and the graphs (at the end use double-click).

5.3.7 Copy Data to Clipboard

Window Term	Description
Copy Data to Clipboard	The Copy Data to Clipboard dialog box is displayed by means of chart pop-up menu.
Averages	Picks the average values of the chosen intervals.
Begin values	Picks the values at the beginning of the chosen intervals.
Raw data	Picks a chosen number of sample values (with max. count only).
Values with step of	The number of retrieved data samples is defined on the basis of a time interval (default). The samples are interpolated.
Values with sample count	The number of retrieved data samples is defined on the basis of a sample count. The samples are interpolated.
Statistics	Exports the data to a statistical application (not applicable to raw data).
Time value	The interval used to sample the variable. The default value is the "width of the column" defined in the display.
Time unit	The unit of interval.
Number of samples	The number of samples taken from the variable.
Show status with HTML format	No significance in the Statistical Tool (selected).
Use display format of variable	No significance in the Statistical Tool.

5.3.8 To List, to Graph

In the chart pop-up menu, the **To List** -command converts the chart from a graphic format into a list format.

When in a list format, the **To List** -command is replaced by a **To Graph** -command. It converts the chart back into a graphic format.



The time interval for retrieving samples is determined in the properties box.
For more, see SYS600 Historian Monitor Configuration manual.

5.4 Legend

The legend shows data related to variables displayed on the chart area. It may also show data for items for which there is no chart visualization.

5.4.1 Description

The legend is located below or to the right of the chart area. There is always one legend for each chart.

For trend charts, the legend is usually located below the chart area. This positioning provides more space for multiple columns.

For column charts, the legend is usually located on the right side of the chart area. This gives more space for multiple rows.

The graphic type of the variable item is displayed as an icon in the first column of the legend. The color of the icon is the same as the color of the item in the graph. The icons are shown in the table Chart item icons.

The legend can be configured to display a variety of information on the variables, such as:

- variable names
- aliases
- IDs
- descriptions
- current values
- units of current values
- the names of the tables from which the values of history and future time are retrieved.

In the case of line and area plots, the legend may display the (trend) values in the pointer's location.

The legend may include text and separator rows:

- A text row presents variable data without a drawn graph.
- A separator row is a blank row.

The icons for text and separator rows are shown in the table Chart item icons.

The following legend display settings can be changed:

- To display columns or item rows that don't fit in the screen area, scroll with the scroll bar at the bottom or on the side.
- To fit more columns on the screen, reduce the width of each column.
- Change the order of columns by dragging them.



This does not apply to the icon column, since it has a fixed position.

- To hide a graph temporarily from the plot area, click the item type icon on the variable's row. Display the graph again by clicking the icon again.
- Edit the variable of the plot in its column and/or in the history column.

One or several variables can be chosen for editing. If several variables are chosen, they must be located next to each other in the same column of the legend rows.

To choose one variable:

- Click on the variable column on the row. The selected variable row is now highlighted and the background color of the selected column is turned darker.

To choose several variables:

- Click the outermost (lowest or topmost) variable column on the row that is to be included in the selection. The selected variable row is now highlighted and the background color of the selected column is turned darker.
- Press SHIFT and click the other outermost variable column of the selection. All the selected rows are now highlighted.

The variables in the column can now be edited.

To edit a variable column:

- Select the variables in the column as instructed above. An arrow indicating a drop-down menu appears in the last row selected.
- Click on the arrow to open the drop-down menu.
- Select a variable by clicking on its name in the menu.
- All the highlighted variables are now changed into the variable that was just selected.

5.4.2 Pop-up menu

When editing selected variable items, the following options are available in the pop-up menu: **Send to, Execute, Recalculate, Remove, Legend Columns and Properties**.

To edit a selected variable item or to execute a selected function:

- Open a pop-up menu by right-clicking the row.
- Choose the desired option from the pop-up menu OR from the function buttons above the menu.



Only those options are active that are possible for selection.

Menu term	Description
Send to	Opens a menu with variable specific displays defined in the system.
Execute	Startup of applications defined in the system.
Recalculate	Startup of applications defined in the system.
Add Marker	Opens a property dialog box, where a new marker to the chart items at a selected time can be added.
Table continues on next page	

Menu term	Description
Remove...	Removes the chart items whose rows are clicked from the plot area and from the legend in question.
Legend Columns...	Opens the Legend Columns dialog box, where the data to display in the column and the data's order can be defined. For further information, see the SYS600 Historian Monitor Configuration manual.
Properties...	Opens the chart item's Properties dialog where an item's properties can be edited. For further information, see the SYS600 Historian Monitor Configuration manual.

With the function buttons the item visibility, item type, marker type, limit type, item fill style and color settings can be edited.

Function buttons for adjusting the chart item properties	Description
Buttons in the upper row	
Invisible	Item visibility Shows the status of visibility (on/off) currently in use. To change the status, click the button. Visible
	Item type Shows the item type currently in use. To change the item type, click the button.
 	Item type options <ul style="list-style-type: none"> • Line, trend • Line, XY scatter • Marker • Area • Stacked area • Stacked column • Stacked column, sorted • Gantt • Gantt, status and color • Stacked column, application status • Application status • Info • Separator
	Marker type Shows the marker type currently in use. To change the marker type, open the pop-up menu from the right corner arrow.
 	Marker type options <ul style="list-style-type: none"> • No marker • Rectangle • Diamond • Triangle • Ellipse • Diagonal cross • Cross • I-beam • Vertical • Horizontal
Table continues on next page	

Function buttons for adjusting the chart item properties	Description
	Scaling limit type Shows the scaling limit type currently in use. To change the limit type, open the pop-up menu from the right corner arrow.
	Scaling limit type options <ul style="list-style-type: none"> • Individual • Automatic • Common
	Properties Click properties to open the Properties window.
Buttons in the lower row	
	Item fill style Shows the item fill style currently in use. To change the item fill style, open a pop-up menu from the right corner arrow.
	Fill style options The pop-up shows the fill style options and the icons related to these options. <ul style="list-style-type: none"> • Solid • Horizontal Slide • Vertical slide • Upward diagonal slide • Downward diagonal slide • Upward diagonal wave slide • Downward diagonal wave slide • Highlight • Horizontal highlight • Vertical highlight • Horizontal lines • Vertical lines
	Color information (Item color/Item secondary color/Chart background color) The three color boxes show the following information (from left to right): <ul style="list-style-type: none"> • Item color: the color in which the selected item is presented in the chart. • Item secondary color: • Chart background color: the color in which the background of the chart is presented.

5.4.3 Legend columns

The data available for the legend is determined by the data sources specified on chart definitions.

	Text	Variable	Filter	Current Value...	History	10/29/2012 10:37...	Min Value	Average	Max Value	
	FIRST1MINUTE(CCCH01_ME1:11@AVG)	CCCH01_ME1:11	AVG1MIN		17 A	CurrentHistory...	14	12	15	18
	AVG1MINUTE(CCCH01_ME1:17@AVG)	CCCH01_ME1:17	AVG1MIN		106 kV	CurrentHistory...	111	108	111	113
	AVG1MINUTE(CCCH01_ME1:20@AVG)	CCCH01_ME1:20	AVG1MIN		194 kW	CurrentHistory...	206	198	206	211
	AVG1MINUTE(CCCH01_ME1:24@AVG)	CCCH01_ME1:24	AVG1MIN		50 Hz	CurrentHistory...	49	49	49	50
	Low Notification Limit									
	Low Warning Limit									
	Low Critical Limit									
	1 Sigma Standard Deviation Low									
	1 Sigma Standard Deviation High									

5.4.3.1 Changing the order of legend columns

Change the order of columns by clicking a column heading and dragging the column either to right or to left in the table. As an exception, the column order for item, icon and sub-columns for limits and statistics are fixed.

The following tables describe the legend data associated with the data retrieved from the database for a chart. Different types of charts produce different default settings for the legend.

On a chart display, a single graph can comprise data from one or two history and future data tables. These may include, for example, a prediction table and a history table from which the values of a variable are retrieved. The respective column headers are often the same for several tables, so an additional attribute related to the header is used to specify the data source as follows:

Abbreviations used in the legend column headers
F = Future (In Finnish: T = Tuleva)
P = Past (In Finnish M = Mennyt)
I = Item (In Finnish: A = Alkio)

For general graph types, the headers of the columns related to the first history data (e.g. "Variable") and the headers of the respective calculated value columns (e.g. "Average") are shown without any abbreviation ("P", "I"). The headers related to the first future data begin with the letter "F" (e.g. "F Variable").

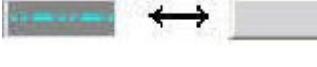
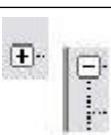
The second history data and the second future data are used only for the "XY-scales" and the "Ordered stacked column" graph types. The abbreviations in these cases are "P2" for the second history data headers and "I2" for the headers of the calculated value columns of the second history data. The abbreviation "F2" (e.g. "F2 Description (Variable)") specifies the columns related to the second future data.

The columns that are typically used in a legend are related to the first history data and the respective calculated values.

List of the generally used columns in the legend:

Column header	Description
Item icon	The item's type as an icon. The column position of this is fixed. The icons used are described in Table Chart item icons in Section 4.11 .
Text	The variable's description in the database, if the data is retrieved from process history. Otherwise the search specification (source and retrieved attributes) or a freely selected text created by the definer.
Description	A description text for the variable (or the history where the data is retrieved from).
Variable	The variable's name in the database. The active variable can be changed here.
Alias	The alias of the variable in the database.
Unit	The unit of the variable's current value in the database.
History	The history table where the data is retrieved from. The active history can be changed here.
Current value	The variable's updated current value.
Table continues on next page	

Column header	Description
Pointer value	If trend values have been requested for the chart, the time pointed to is displayed in the column heading and the column's rows shows the corresponding calculated values. For linear plot styles, the trend value is created by interpolating. In the case of step styles, the trend value is the actual value of the point. Note that the unit of the trend value in the sum and integral tables does not equal the unit of the current value shown in the legend.
Lower limit	The individual lower scaling limit of the variable's plot area.
Upper limit	The individual upper scaling limit of the variable's plot area.
Average	The average of the values retrieved to the screen.  This value is not refreshed automatically on the screen.
Deviation	The deviation of the values retrieved to the screen.  This value is not refreshed automatically on the screen.
Minimum	The minimum of the values retrieved to the screen.  This value is not refreshed automatically on the screen.
Maximum	The maximum of the values retrieved to the screen.  This value is not refreshed automatically on the screen.
Filter	The filtering syntax currently applied to the variable. See Section 5.4.4 .

Activation button	Description
	To temporarily hide an item and its sub-items in the plot area, click its icon in the legend. The icon will change into the same color as the background while the item row is dimmed. Clicking the icon again will display the plot and the row will be visible again.
	Sub-item is a limit or statistic item associated with a main item. All its parameters are defined on the main item. The icon of the sub-item shows its graph style in the plot area. To temporarily hide the sub-item in the plot area, click its icon in the legend. Clicking the icon again will display the plot.
	Drag the legend's items (rows) to change their order. This will also change the order of curves in the plot. This is useful, for example, if the plot of the wanted variable is behind other plots. It is also possible to temporarily hide the plot that covers the wanted plot, or change the plot area limits of variable items.
	Buttons used to hide or reveal the 'Limits' and 'Statistics' items.

5.4.4 Using the filter functionality

The filter column provides a flexible interface for modifying the display of any of the selected variables. The key principle is that the user can define a filter to perform the desired operations by typing in the keywords defined in the filter syntax. The syntax and keywords are described in the following paragraphs and tables.

The syntax consists of a filter selection part and a time period part. For example, "AVG10MIN" calculates and shows the averages over ten minute time spans. Several filters can also be applied one after another. They are separated with the symbol "|". For example, "AVG1MIN|MAX1H" produces the hourly maximum values from the one minute average values.



Vtrin automatically changes history tables, if this optimizes the search. This optimization can be turned off by starting with an empty filter, that is the "|" sign. For example, "AVG1MIN" is optimized while "|AVG1MIN" is not optimized.

To enter the desired filter syntax, double-click the filter field of the selected variable. This opens the field in editing mode where the desired filter can be typed. A drop-down menu appears after the first character is typed showing all filter keywords beginning with the letter. Erase all letters typed to retrieve all available filter types.

To remove the filter press **Delete** or erase the field empty and press **Enter**.

If no time period is defined, the filter takes the whole visible time period as input. Thus, for example, "AVG" produces the average over the selected time period. To apply the filter with a selected time period append the filter syntax with a number and one of the pre-defined time identifiers. For example, "AVG10MIN" returns the ten minute averages for the selected time period.

The set of available filters

AAVG	Arithmetic Average
ADEV	Arithmetic Deviation
ADEVP	Arithmetic Deviation of Entire Population
AMEDIAN	Arithmetic Median
AMODE	Arithmetic Mode
AVARIANCE	Arithmetic Variance
AVARIANCEP	Arithmetic Variance of Entire Population
AVG	Time Weighted Average
AVGRAW	Raw Time Weighted Average - ignoring the invalidity of values
CALC	User Defined Calculation. E.g. CALC(y*2) returns values doubled and CALC(y > 0 ? 10:20) returns 10 if y > 0, otherwise return 20. For more information, see Supported constants and functions in the CALC Filter .
COUNT	Count of Samples Within Period
COUNTG	Count of Good Samples Within Period
COUNTI	Count of Invalid Samples Within Period
COUNTQ	Count of Questionable Samples Within Period
COUNTS	Count of Substituted Samples Within Period

Table continues on next page

CONVERT	Converts Values to User Specified Unit. E.g. CONVERT(hp) can be used to get horse powers out of kilowatts
CUMSUM	Cumulative Sum
CUMSUMTO-DOUBLE	Cumulative Sum to Double Value
DELTA	Last Sample In Period minus First Sample In Period
DEV	Time Weighted Deviation
DUR	Duration = Period Length (changes only upon daylight savings or with month periods)
DURG	Good Duration as a TimeSpan Within Period
DURI	Invalid Duration as a TimeSpan Within Period
FIRST	First Value of a Period
FFT	Fast Fourier Transform of input data
HISTOGRAM	Histogram of input data
INTSEC	Time Integral in Seconds
INTMIN	Time Integral in Minutes
INTHOUR	Time Integral in Hours
LAST	Last Value of a Period
MAX	Maximum Value of a Period, TimeStamp is the Value Time
MAXPT	Maximum Value of a Period, TimeStamp is the Period Time
MIN	Minimum Value of a Period, TimeStamp is the Value Time
MINPT	Minimum Value of a Period, TimeStamp is the Period Time
OPTIME	Operating Time. Requires a parameter, e.g. OPTIME10MIN(>5) calculates the time the value has been greater than 5.
PERG	Percent of Good Samples (0–1)
PERI	Percent of Invalid Samples (0–1)
RANGE	Maximum Value Within a Period minus Minimum Value Within a Period
STABILITY	Stability Graph
STARTUP	Startup Count - requires a parameter. E.g. STARTUP5MIN(>5) calculates the number of occurrences the value has increased from less than or equal to five to greater than five.
SUM	Sum of Values Within a Period
SUMRAW	Raw Sum - Ignoring the Invalidity of Values
SUMTODOUBLE	Sum of values within a period calculated to double - use if there is a risk of overflow
VARIANCE	Time Weighted Variance
WHEN	Conditional fetch of values. Returns requested values when given conditions are greater than zero. Syntax: <i>WHEN(Class=...;Property1=...;Property2=...; ...etc... Proper-tyN=...;xProperty=...;yProperty=...;Filter=...)</i> See Using the WHEN Filter for more detailed information.

The set of available time identifiers

No period length	The whole period between start time and end time is used. E.g. AVG return the average value for the whole period.
TICKS, HUNDRED-NANOSECONDS	Hundred nanoseconds
MICROSECOND, MICROSECONDS	Microseconds
MS, MSEC, MILLI-SECOND, MILLI- SECONDS	Milliseconds
S, SECOND, SECONDS	Seconds
MIN, MINUTE, MINUTES	Minutes
H, HOUR, HOURS	Hours, local time
H_UTC, HOUR_UTC, HOURS_UTC	Hours, UTC time
D, DAY, DAYS	Days, local time
D_UTC, DAY_UTC, DAYS_UTC	Days, UTC time
MON, MONTH, MONTHS	Months, local time
MON_UTC, MONTH_UTC, MONTHS_UTC	Months, UTC time
Y, YEAR, YEARS	Years, local time
Y_UTC, YEAR_UTC, YEARS_UTC	Years, UTC time
PL, PLEN, PERIODLENGTH	Source data period lengths. E.g. if source data is AVG5MIN, AVG2PLEN produces data that has been averaged over 10 minutes. (AVG5MIN AVG2PLEN equals AVG10MIN)

5.4.4.1 Supported constants and functions in the CALC Filter

Supported constants:

- y = the current y value
- x = the current x value
- π = pi
- e = natural logarithmic base
- prevy = previous y value, for the first value in result set this is the same as y
- prevyz = previous y value, for the first value in result set this is zero
- prevx = previous x value, for the first value in result set this is the same as x
- prevcy = previous calculated y value (result of the calculation of previous values)
- periodlength = period length in 100 nanosecond units
- goodtime = time the value has not been invalid (representativeness affects too)
- meantime = $x - \text{prevx}$

Supported functions:

- $\text{abs}(x)$ = absolute value of x
- $\text{acos}(x)$ = arcus cosine of x
- $\text{asin}(x)$ = arcus sine of x
- $\text{atan}(x)$ = arcus tangent of x
- $\text{ceiling}(x)$ = x rounded to next greater integer value
- $\text{cos}(x)$ = cosine of x
- $\text{cosh}(x)$ = hyperbolic cosine of x
- $\text{exp}(x)$ = returns e raised to specified power
- $\text{floor}(x)$ = x rounded to next smaller integer value

- $\log(x, y)$ = returns base y logarithm of the specified number
- $\log10(x)$ = returns base 10 logarithm of the specified number
- $\max(x, y)$ = if $x > y$, returns x, else y
- $\min(x, y)$ = if $x < y$, returns x, else y
- $\pow(x,y)$ = returns x raised to power of y
- $\rand(x)$ = returns a random number from 0 to x
- $\rem(x, y)$ = returns the remainder of x divided by y
- $\round(x)$ = rounds x to closest integer value
- $\rounda(x, y)$ = rounds x to y decimals, away from zero
- $\rounde(x, y)$ = rounds x to y decimals, to even
- $\sign(x)$ = returns 1 or -1 depending on the sign of the number
- $\sin(x)$ = sine of x
- $\sinh(x)$ = hyperbolic sine of x
- \sqrt{x} = square root of x
- $\tan(x)$ = tangent of x
- $\tanh(x)$ = hyperbolic tangent of x
- $\truncate(x)$ = truncates the decimal part of the x away

5.4.4.2 Using the WHEN Filter

The WHEN Filter can be used for conditional fetch of values. The filter returns the requested values when conditions given as arguments are greater than zero.

Syntax: *WHEN(Class=...;Property1=...;Property2=...; ...etc... PropertyN=...;xProperty=...;yProperty=...;Filter=...)*

No argument is compulsory. There can be 0-N properties of the given class used as conditions. Default value for "Class" is "ProcessHistory", which is used, if the "Class" argument is left empty. Available classes are the same as the sources for a trend. Properties are the same as the properties for the trend sources. E.g. a first property can be "Variable" and a second property can be "History" for the "ProcessHistory" class. Filter can be any valid filter operation.

Example use 1:

WHEN(Class=ProcessHistory;Variable=SYS_CPU_TotalTime;xProperty=Time;yProperty=Value;Filter=CALC(y>20))

The clause above returns the "CPU Total time" variable's values when the value is greater than 20.

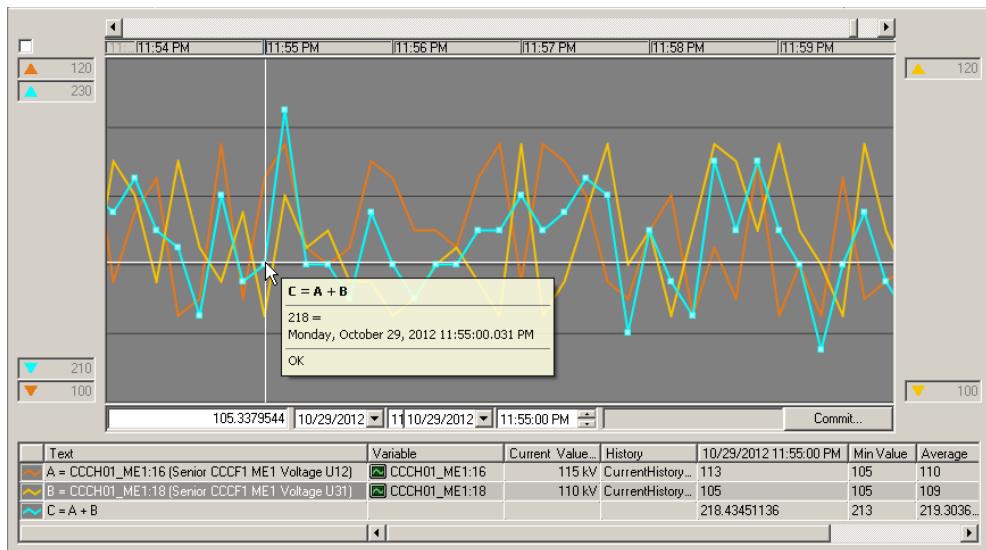
Example use 2:

WHEN(Variable=SYS_CPU_TotalTime;Filter=CALC(y>20))

Returns the same values as Example 1, as the only difference is the lack of default values.

5.5 Calculated Trend

The user can create new variable items that are calculated from the data of the existing variables. In our example, variable C is the sum of variables A and C.



If the time span contains both history and future, the calculated variable item will not be displayed as a graph. For more, see the manual **SYS600 Historian Monitor Configuration/Graph Properties/Calculation tab/**.

5.6 Scaling Limits

The limits determine the scaling of plots.

5.6.1 Description

The scaling limits are usually displayed on the left side of the plot area. If there are several charts, each has its own area for limits.

The scaling limits can be displayed in two ways: with the upper and lower limits of scaling displayed in the boxes, or by using scales whose end points correspond to the upper and lower limits.

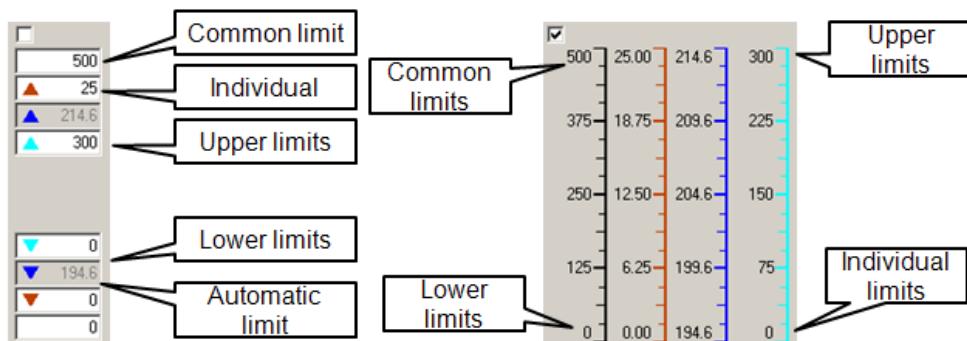
The graphs in the chart window can have either common or individual limits. (For explanations, see **Limit indicators**.)

Individual and common scaling limits can be changed by using boxes at the ends of the scales. If the automatic scaling option is turned on, the boxes are grey and the values cannot be changed.

The upper limits are located at the top and the lower limits at the bottom of the scale area. The values of variable items are scaled so, that the value corresponding to the upper limit is drawn at the top of the plot area and the value corresponding to the lower limit is at the bottom of the area. If the graph exceeds the upper limit or falls below the lower limit at some intervals, the graph is not drawn on these intervals.

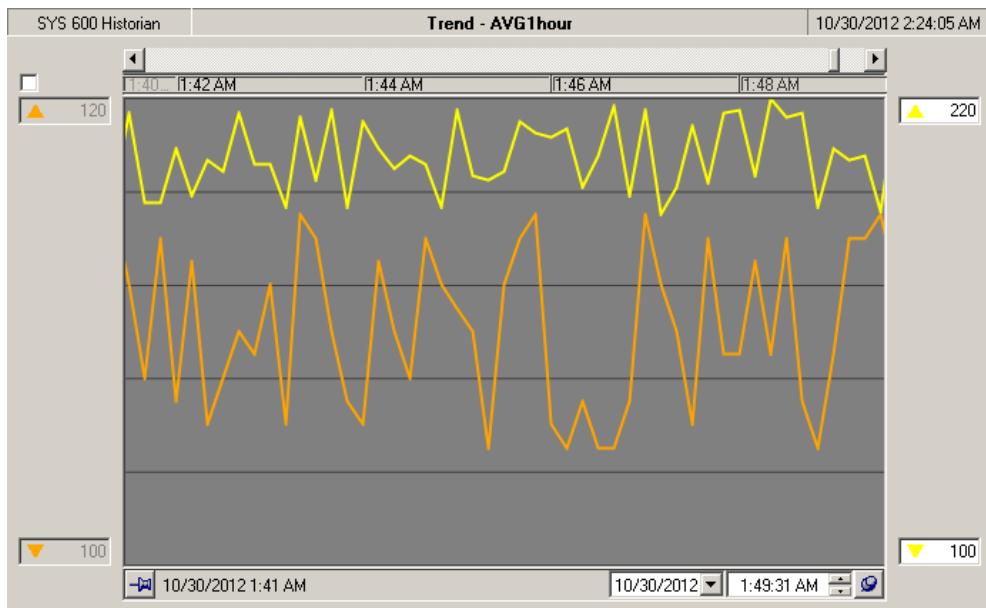
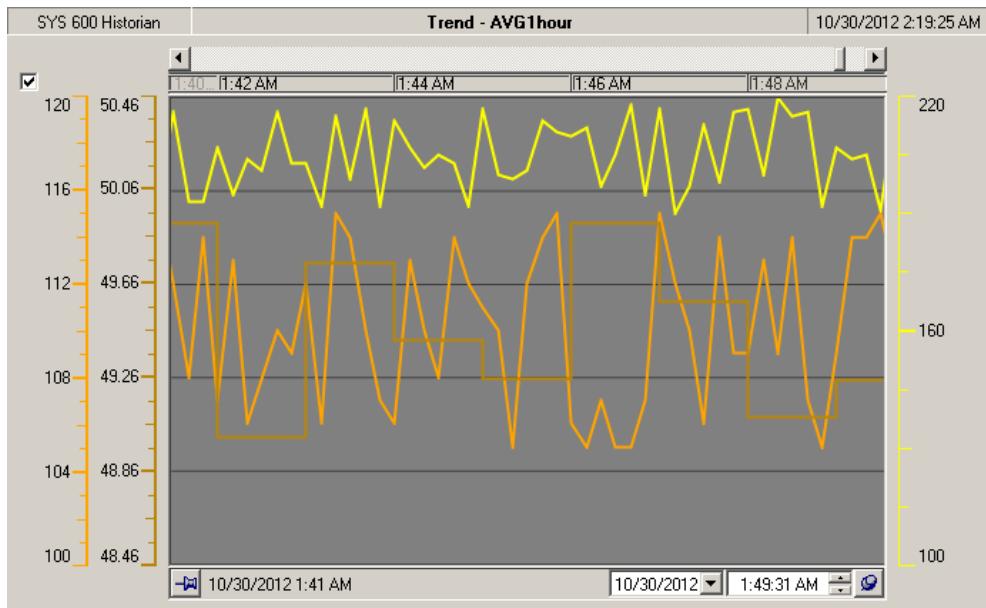
If the scaling is depicted using scales, the common limits are displayed using a black scale. The scale for graphs with individual limits is shown with the same color as the graph.

5.6.2 Limit indicators



Limit scale field	Description
Upper limits Lower limits <input type="checkbox"/> <input checked="" type="checkbox"/>	The upper scaling limits are located at the top. The lower scaling limits at the bottom. Limit presentation option <input type="checkbox"/> = upper and lower limits enabled <input checked="" type="checkbox"/> = scale enabled
Common limit <input type="text" value="500"/> <input type="text" value="0"/>	The common upper scaling limit is the highest upper limit, while the common lower scaling limit is the smallest lower limit. Common limits are only displayed if they are used in one of the graphs and if no individual limits have been defined for the plot. The common limit values can be changed by entering a new value in the box.
Individual <input type="text" value="25"/> <input type="text" value="0"/>	The individual upper and lower scaling limit of the curve. Individual limits are marked in the boxes with a small triangle, the color of which is the same as that of the graph. To change the individual limit value, enter a new value in the box.
Automatic limit <input type="text" value="214.6"/> <input type="text" value="194.6"/>	Automatically calculated individual upper and lower scaling limits of the plot. If automatic scaling is used for the variable, the variable's limits are calculated automatically and cannot be changed. The background color of the box for automatic limit is grey.  Also common limits can be automatically calculated. When they are automatically calculated, the background color is grey and the values are defined with the help of the minimum and maximum values of the graphs.  For uptime variables automatic and individual limits need to be used in order to get the correct time format visible in the limit indicators.

If several graphs are added to the same chart, the scale limits are displayed on both sides of the chart. The first is depicted on the left, the second on the right, the third on the left again and so on. The figure below shows a chart with three graphs, each using individual and automatically set scaling limits.



5.7 Time bar

The time bar allows the user to select the time range for displaying the plots of the variables.

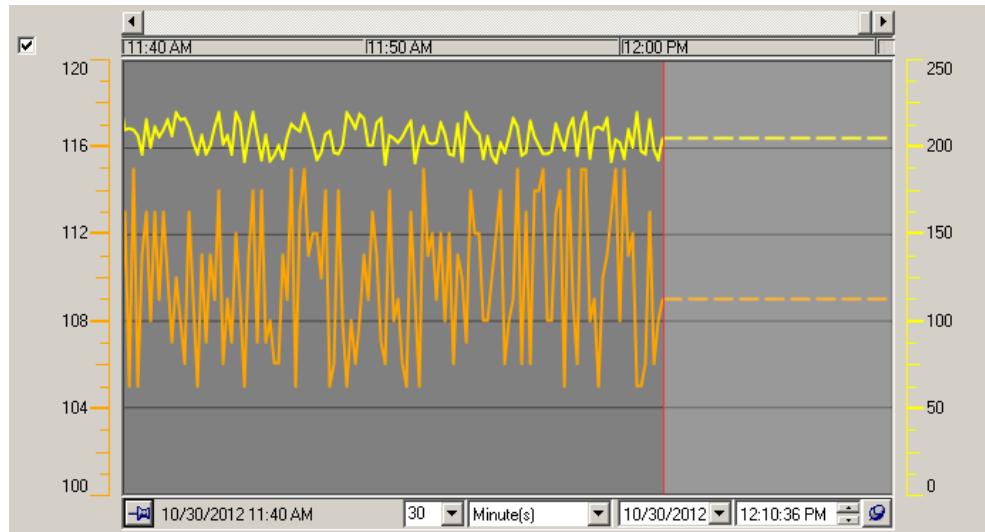
5.7.1 Description

The time bar is usually displayed under the plot area. It shows the start time of the time span in the left end of the row and the end time of the time span on the right end. The length of the time scale of a chart equals the difference between the start time and the end time.

The current time, which means the current time on the server, is usually located in the right end of the time span, but can also be located in the middle or in the left end when the time span stretches into the future.

The plot values displayed on the left side of the current time are retrieved from the source table for history data. They can be average values or current values. The plot values shown on the right side of the current time are retrieved from the source table for future data, which is usually a prediction table. This requires that a prediction table has been configured into the system.

A red vertical line in the plot area signifies the current time (see figure below). The future area to the right from the red line is indicated by dimming the background.



Both ends of the time bar have a pin icon, which can have any of the following states:

	The time next to the pin is updated (only used at the right end)
	The time next to the pin is unlocked
	The time next to the pin is locked

The display's update mode is determined in the following way, depending on the status of the pins:

	Normally updated display. If the time span is changed, the time scale and the time at the left end of the time span change accordingly and the display continues to be refreshed.
	Unrefreshed display. If changes are made to the time span, both times change by an amount equal to half of the modified time difference and the time scale changes.
	Unrefreshed display. If a locked time is changed, the time scale moves by an amount equal to the modified time difference. If the time span is changed, the unlocked time moves by an amount equal to the modified time difference and the time scale changes.
	Unrefreshed display. If a locked time is changed, the time scale changes by an amount equal to the modified time difference.
	The display is updated and the time scale keeps expanding. If a locked time is maintained, the time scale changes by an amount equal to the modified time difference and the display continues to be updated. Note! The display causes a load on the system.

5.7.2 Time bar



Display Term and Activation button	Description
Time span	The time span – that is, the difference between the start and the end time – is displayed in the boxes in the middle of the time bar when at least one of the time span's ends is unlocked or updated. The value and unit of the interval are displayed in their own text boxes. To change the interval, change either the value and/or unit. An inexact interval is indicated in the following way:
Start time	Free start or end time that cannot be changed.
End time	Change the locked start or end time to view the graph at different times and to use a longer or shorter time span. A locked start or end time that can be changed. The indicator for daylight saving time is displayed on the right side of the time. A check mark in the box indicates day-light saving time. Usually the indicator, either checked or unchecked, is disabled. When the time stamp falls in the one-hour interval during which we move from daylight saving time to standard time, the indicator box is not disabled, allowing the user to specify whether the time stamp refers to daylight saving or standard time.
Updated pin	To lock the time, click the pin.
Free pin	To lock the time, click the pin. Double-clicking the pin moves the time to the update status.
Locked pin	To release the time, click the pin. Double-clicking the pin moves the time to the update status.

5.8 Time scroll bar

The time scroll bar allows the user to select the time for which the graphs of variables are presented in the chart.

5.8.1 Description

The time scroll bar is usually located above the plot area. The location of the scroll box indicates the location of the chart. History time is to the left and future time is to the right.

When the chart window is opened, the chart area on the left side of the scroll box represents the available history time area, while the chart area on the right side represents the available future time area. The time areas correspond to the maximums of the history and future times of all the variable items in the chart based on the source tables defined for the variables.

To view the graphs at different times, move the scroll box. The time span remains unchanged. Moving the scroll box locks the end time, and the graphs are no longer refreshed. To return to the original chart view, unlock the end time in the time bar.

5.8.2 Time scroll bar



Display Term and Activation button	Description
Scroll box	<p>The time span for which the curves are displayed moves backwards or forwards in time when the scroll box is moved.</p> <p>The start and end times of the time span change to correspond to the new location of the chart in the available time area. The time span remains the same.</p> <p>The end time is locked, the pin is pushed down and the graphs are no longer refreshed.</p> <p>Double-clicking the pin to unlock an end time will return the original view.</p> <p>The pin is updated, the scroll box moves to its original location and the graphs will be refreshed again.</p>

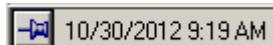
5.9 Time Scale

With time scale the user can set limits for the time span used in the chart.

5.9.1 Description

The time span setting area is located below the plot area. It consists of a start time indicator, drop-down menus with which the used time span can be set, and an end time indicator.

- Start time shows the earliest time the chart shows.



- The drop-down menus show the numerical value and the time span unit selected for the time span. Both the numerical value and the unit can be changed from the menus.



- End time shows the latest time the chart shows.

 10/30/2012 12:28 PM

5.9.2 Setting time scale

Set the time span from the two drop-down menus:

1. Set the numerical value that shows how many of the selected units are shown.
To select a numerical value:
 - Choose the correct value from the drop-down menu on the left.
 - Select the desired option by clicking on its row.
2. Select the desired unit (for example seconds, minutes).
To select the correct unit:
 - Choose the desired unit from the drop-down menu on the right.
 - Select the desired option by clicking on its row.



If the selected numerical value does not match the selected unit exactly, the numerical value is rounded to a matching value closest to the original.

5.10 History Updating and Recollection

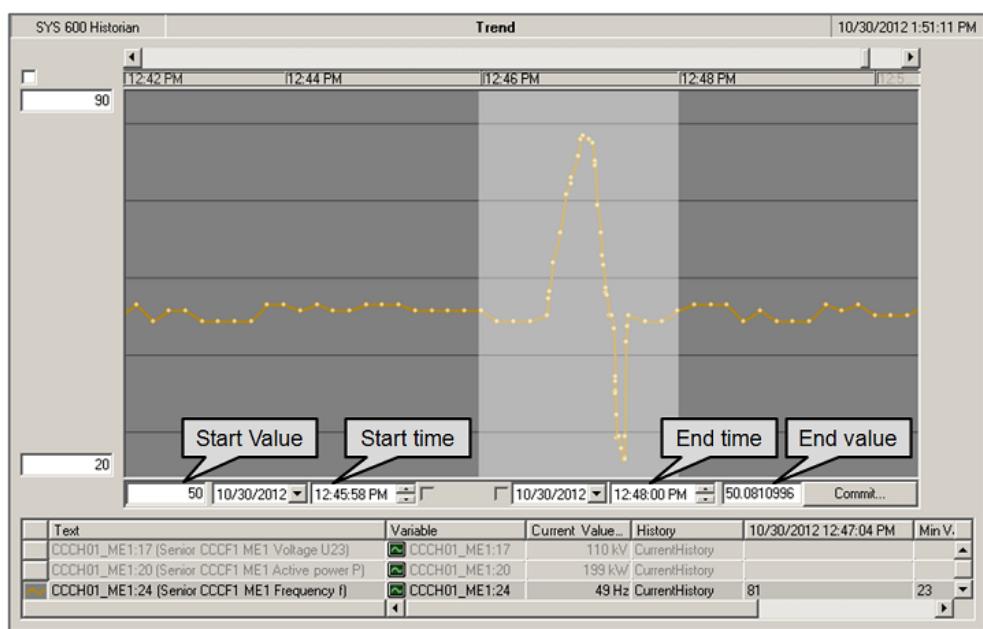
Values in the history tables can be updated e.g. to correct possible errors or to insert missing values. To correct history data, update the values in history tables and activate so called recollection to compute the calculated variables and transformations. This propagates the changes to all affected history tables. The values of a variable in a history table can be updated for either a selected time span, single value or a single point in a chart window that displays the variable values from the history table. The updating functions are:

- adding new values
- replacing existing values
- deleting existing values

From history updating point of view, there are two kinds of history tables: periodic and non-periodic. After having updated the values of all variables that need to be corrected, activate recollection for all variables in the history table for this time span. This can be done in any chart window. Depending on the recollection definitions in the SYS600 Historian, the recollection may be cumulated for all higher-level history tables.

5.10.1 How to update values of a variable in a history table

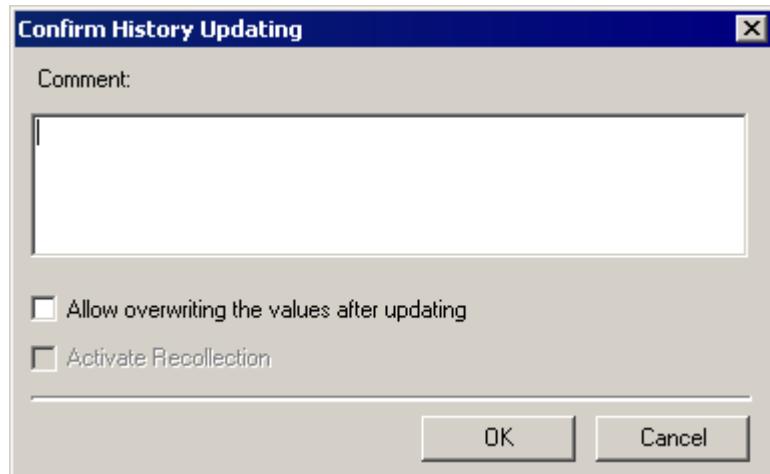
- Open a chart window that presents values of the variable that should be updated (in the example charts, the data points are marked for clarity).
- Click the variable in the legend to select it, and then select the updateable. After the selections, the system shows the start and end values of the selected time span as the default values. The values can be seen in the value boxes next to the time span start and end times.
- If the selection is changed, the value boxes will show the new default values.



Trend of a variable from a non-periodic table

Display Term	Description
Start value	The value used as the start value for a time span based history value updating. Initialized with the value of the variable at the start time of the time span.
Start time	The start time of the time span.
End time	The end time of the time span.
End value	The value used as the end value for a time span based history value updating. Initialized with the value of the variable at the end time of the time span.

- To change the values, enter new values in the value boxes.
 - To remove the history values, clear the values from the value boxes. The values can also be removed by selecting **Remove Time Span Values...** from the **Graph Area** pop-up menu.
 - To activate the updating click the **Commit...** button. After clicking the button, the Confirm History Updating dialog box shows up with the following information:

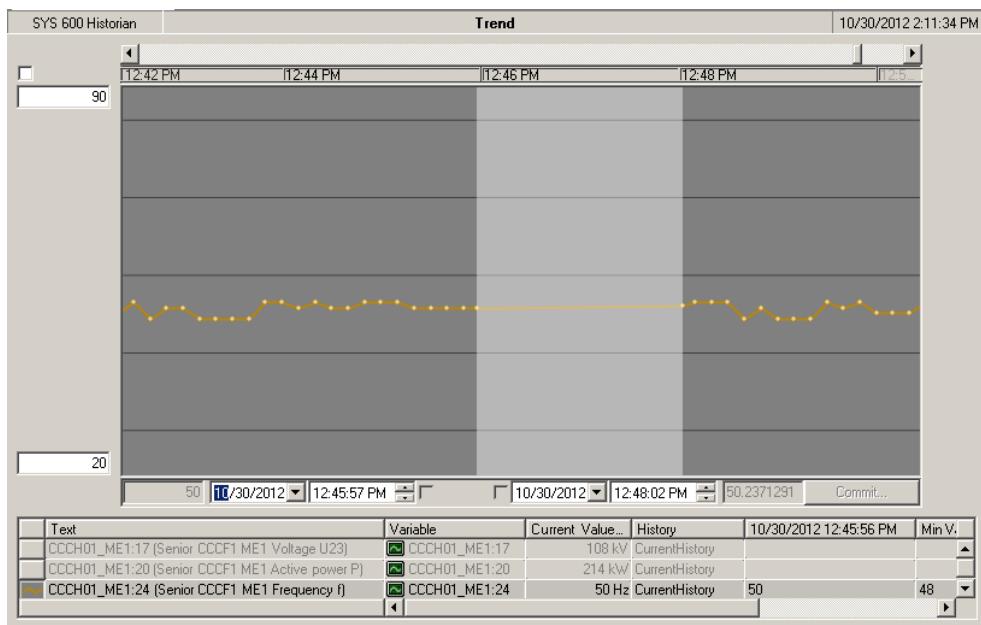


- Optional Comment is stored into the history update log. The maximum length for the comment is 80 characters.
- Check box **Allow overwriting the values after updating** controls the later handling of the updated values. If this option is selected, the transformations that will be calculated in this table will overwrite the values that have been manually updated.
- Click **OK** to activate updating or **Cancel** to cancel it.

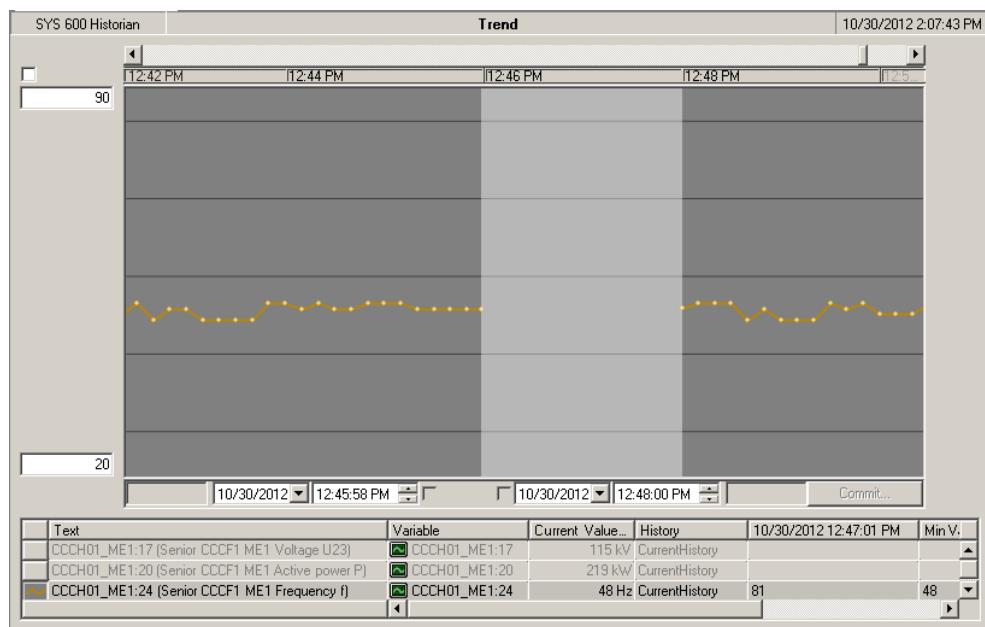
5.10.1.1 Updating non-periodic history values

Update or delete operation inserts new data points immediately before (-100ns) the start time and immediately after (+100ns) the end time of the time span and assigns them to the original values at those time positions, and then removes values that the time span covers. Updating then also adds the values specified in the value boxes.

If the history table to be updated is **CurrentHistory** and the value to be inserted is newer than the newest history value of that variable, then the new value goes through the current value processing. Otherwise the values are put directly into the target table.



The effect of the history update is seen as a straight line from the start value to the end value and as the additional value points just before and after the selected time span.



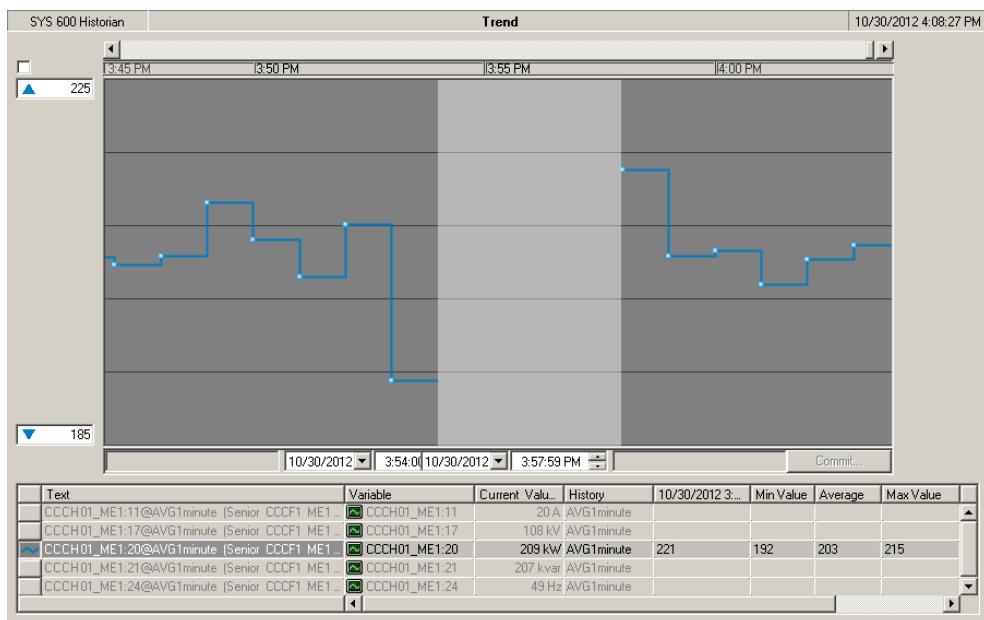
The effect of history value deletion is seen as an empty region from the left additional value to the right additional value. The highlighted area remains selected and the user can update the values of another variable on the same time span. To do so, continue by selecting the desired variable from the legend.

In addition to the time span based updating there are two more ways to update history values:

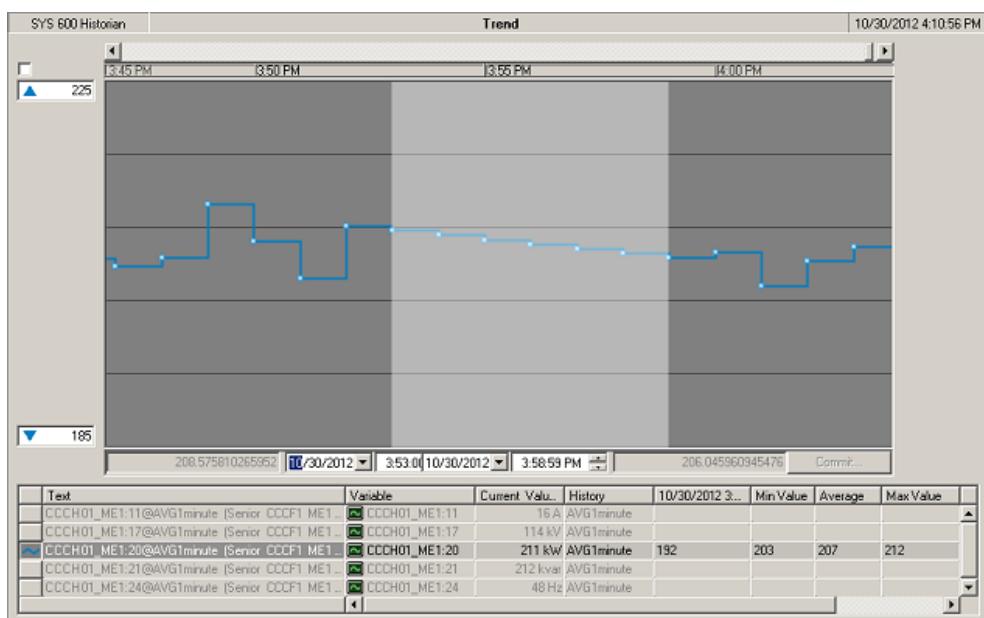
- Insertion, replacing or deletion of a single data value of a history table. These are initialized with a single click on a chart. The system responds by showing a vertical line on top of the chart. The time and the corresponding default value are shown on the time bar.
- Replacing or deleting a single data point of a history table. To initialize these options, set the cursor on a chart so that the ToolTip of the value to be updated becomes visible. Then hold down the SHIFT key and click. The system responds by highlighting the range, which begins from the shown data value and ends just before the next data point of the variable or at the right end of the chart. The default value and the corresponding time are shown in the time bar. In this case, the update function replaces or deletes the value which is in the beginning of the highlighted area.

5.10.1.2 Updating periodic history values

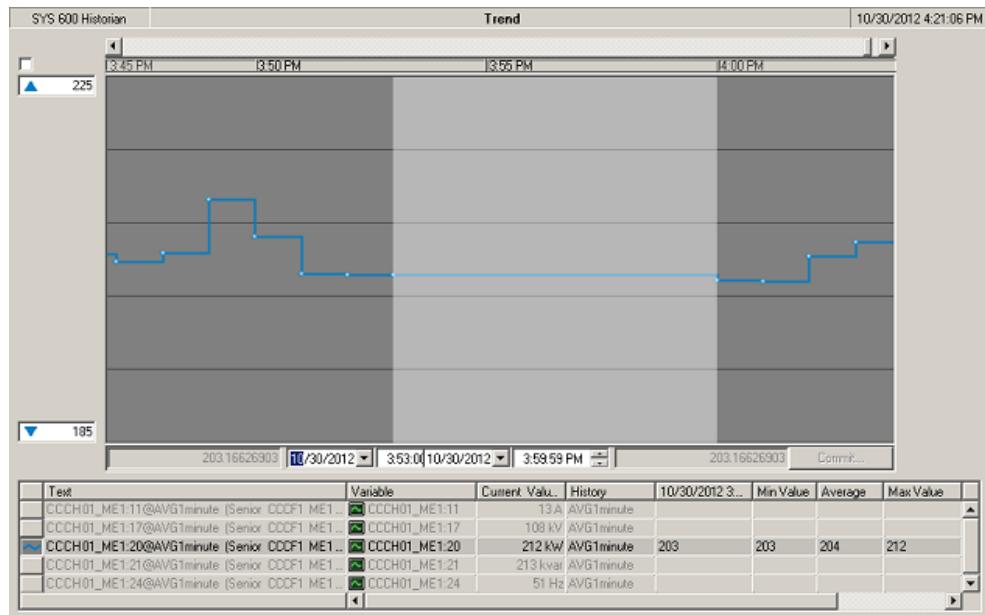
The update procedure for values in periodic type history tables is slightly different from the updating of a non-periodic table. Here, as an example of a periodic type is an average value table. Selection of a variable is done like before. However, while selecting the time span, the system expands the time span to cover full period lengths regardless of the original selection.



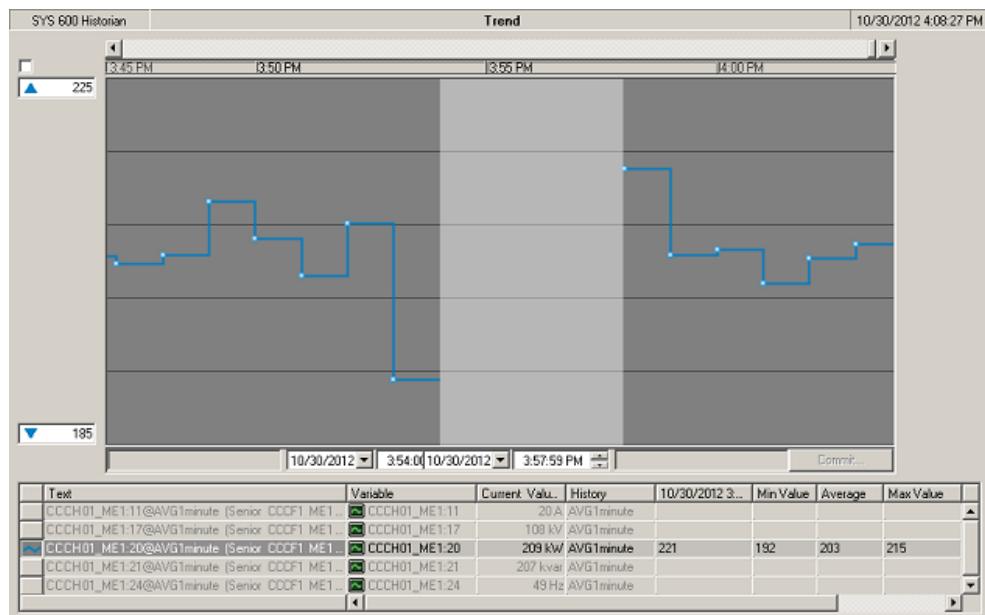
In case of different start and end values, the update function produces new values for every time period using interpolation.



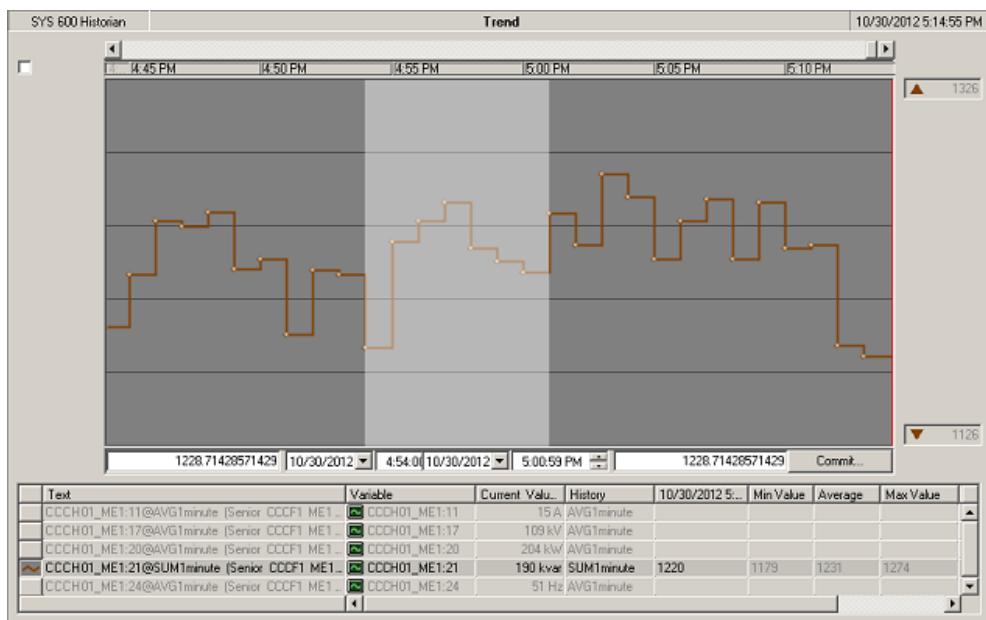
In case of equal start and end values, the update function produces a value only to the beginning of the first period within the time span.



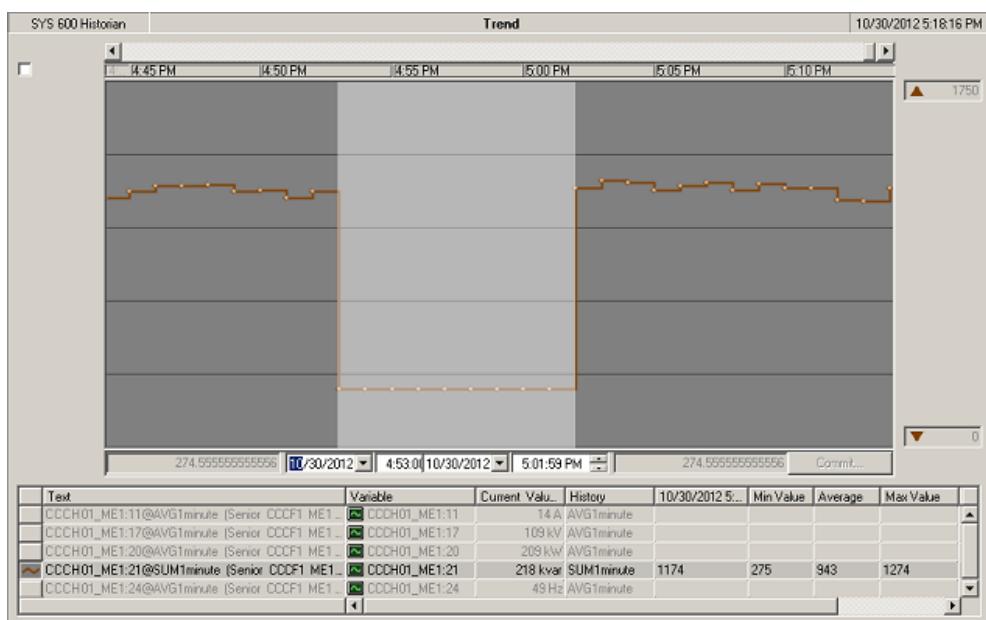
In case of value deletion, the update function removes the values covered by the time span.



Another example of a periodic type is the sum of values. The default values suggested by the system are equal in this case.



In case of sum of the values, the update function produces equal values to every time period covered by the time span.



Section 6 Lists

List windows show database data (attributes) in a list format. Examples of lists include the variable list, maintenance log and user log. All lists are viewed in basically the same way. Some lists, however, may contain more properties than others. This section uses the variable list as an example.

6.1 Description

The list name is displayed on the tab. When the cursor is brought over a list name, a ToolTip that shows the location database of the list and call path will be displayed. A search bar, an advanced search bar and the column headings are displayed at the top of the list window, while scroll bars are displayed on the right and at the bottom. Depending on the list configuration, the search and advanced search bars may be visible or hidden.

The list area displays the list items. Examples of items include the variables of the variable list. The list has one row with columns for each item. Rows can be browsed with the scroll bar on the right and columns with the scroll bar at the bottom. If a row has been enabled, there is a number in front of it.

Column headings show the names of the columns in the list. Sort the items based on the information on 1-5 columns (unless this has been prevented in the list configuration). A small triangle in the column heading indicates that the items have been sorted on the basis of the column in question. The direction of the triangle indicates whether the items have been sorted in ascending (▲) or descending (▼) order. If the items have been sorted on the basis of several columns, a number is shown next to the triangle. Number 1 indicates the column that the items have been first sorted by, number 2 the second column the items were sorted by and number 3 the last column that the sort is based on.

Define the list to display either one item or a group of items by defining general string criteria for the search bar, and column-specific string, list and selection criteria for the advanced search bar. The list can be refreshed with the Refresh button. If the displayed list is extended, the refresh button begins to flash after changes have been made to search criteria.

Column widths can be modified depending on how the user wants the data to be displayed on screen. The order of columns can be changed by dragging and dropping.

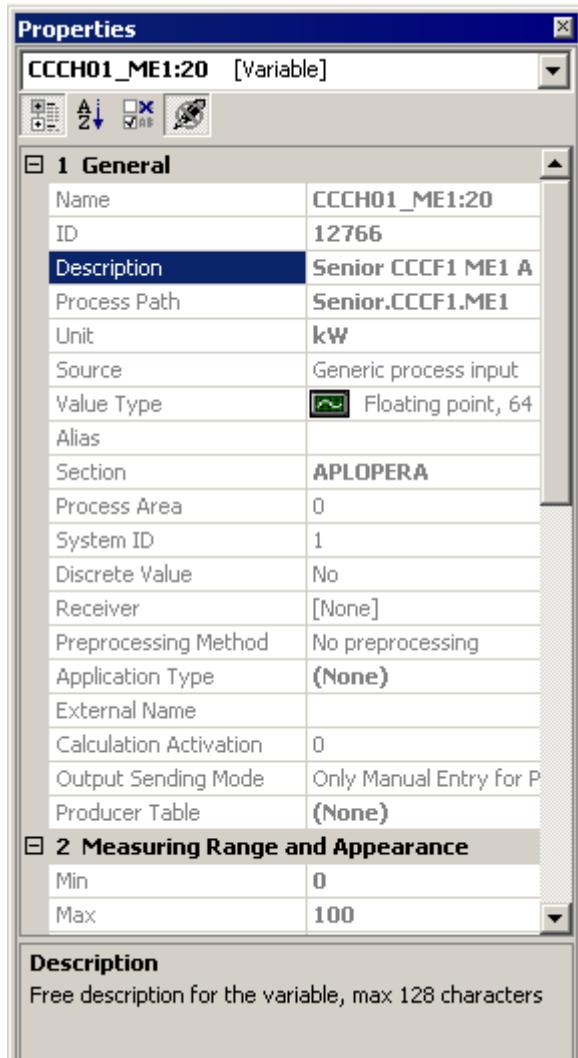
These functions are only available if they have not been disabled in list configurations. Right-clicking the column heading displays the pop-up menu.

Menu Term	Description
Primary Sort	The items are first sorted by the column the user clicked to display the pop-up menu. Select an ascending or descending order. A triangle and the number 1 will be displayed in the column. The number is only displayed if the items are sorted by more than one column.
Secondary...Fifth Level Sort	The items are sorted in the second (or fifth) place by the column that is clicked to display the pop-up menu. Select an ascending or descending order. A triangle and the number 2 (-5) will be displayed in the column.
Column Widths by Contents	Resizes the list column widths to the default column width.
Print	Opens the Print dialog that allows the user to print all list pages (the list will display columns starting from the left according to the width of the paper).
Table continues on next page	

Menu Term	Description
Search	Enables the search bar. Selecting the command again disables the search bar.
Advanced Search	Enables the advanced search bar. Selecting the command again disables the advanced search bar.
Appearance Locked	Locks the appearance of the list. Only the Primary Sort is active and the order of the columns changes.
Sorting Locked	Locks the sorting configuration of the list, and the user can no longer change the column that the sort is based on by clicking a column. However, the items can still be sorted using the options in the pop-up menu. Selecting the command again releases the lock.
New	Creates a new item. This option is only displayed in lists that allow items to be added.
Properties	Displays the Properties dialog, where the user can change the appearance and functions of the list. Further information about this dialog box can be found in the manual SYS600 Historian Monitor Configuration.

Item data can be viewed and changed (in Edit mode, with sufficient authorization) directly in the list or in the general Properties dialog by clicking the item.

The data for one item, displayed in a list row, is presented in a row of its own in the Properties dialog.



The user can choose how the information is presented in the window.

Properties Dialog	Description
	Grouping Click the Grouping button to turn grouping on/off. When grouping is on, the information is presented categorized under group titles. When grouping is off, the information is presented in a list format without any titles.
	Alphabetical order Click the Alphabetical order button to turn alphabetical order on/off. When alphabetical order is on, the information is shown in an alphabetical order, from a to z. When alphabetical order is off, the information is shown in the same order as in the chart columns.
	Selected only Click the Selected only button to show the selected/all information. When the selected only is on, only items selected to be viewed in the chart columns are shown in the Properties window. When the selected only is off, all items are shown in the Properties window, even those that are not shown in the chart columns.
	Include read-only Click the Include read-only button to include/exclude the information that has a read only status. When the read-only information is included, the user can view also items that can't be edited. When the read-only information is excluded, the user can only view items that can be edited.

Properties	When the user clicks a row in the Properties dialog box, the explanation of the data on the row (and in the corresponding column) is displayed at the bottom of the window. Section 4.6 contains more information about the Properties dialog box.
-------------------	---

Right-clicking the first column of the row displays a popup menu whose commands are presented in the SYS600 Historian Monitor Configuration manual.

6.2 List screen

6.2.1 Sample list view

Variables						
	Name	ID	Description	Process Path	Current Value	Unit
1	CCCH01_MEI:10	12748	Senior CCCF1 ME1 Current L1	Senior.CCCF...	18 A	Generic process input
2	CCCH01_MEI:11	12749	Senior CCCF1 ME1 Current L2	Senior.CCCF...	11 A	Generic process input
3	CCCH01_MEI:12	12750	Senior CCCF1 ME1 Current L3	Senior.CCCF...	17 A	Generic process input
4	CCCH01_MEI:16	12771	Senior CCCF1 ME1 Voltage U12	Senior.CCCF...	105 kV	Generic process input
5	CCCH01_MEI:17	12772	Senior CCCF1 ME1 Voltage U23	Senior.CCCF...	111 kV	Generic process input
6	CCCH01_MEI:18	12773	Senior CCCF1 ME1 Voltage U31	Senior.CCCF...	106 kV	Generic process input
7	CCCH01_MEI:20	12766	Senior CCCF1 ME1 Active power P	Senior.CCCF...	191 kW	Generic process input
8	CCCH01_MEI:21	12767	Senior CCCF1 ME1 Reactive power Q	Senior.CCCF...	215 kvar	Generic process input
9	CCCH01_MEI:22	12768	Senior CCCF1 ME1 Apparent power S	Senior.CCCF...	184 kVA	Generic process input
10	CCCH01_MEI:23	12769	Senior CCCF1 ME1 Power factor Cos	Senior.CCCF...	1 Cosf1	Generic process input
11	CCCH01_MEI:24	12770	Senior CCCF1 ME1 Frequency f	Senior.CCCF...	49 Hz	Generic process input
12	CCCH01_Q1:10	12751	Senior CCCF1 Q1 Disconn. position indication	Senior.CCCF...	Alarming...	Generic process input
13	CCCH01_Q1:10	12759	Senior CCCF1 Q1 Disconn. position indication	Senior.CCCF...	Closed	Generic process input
14	CCCH01_Q1:115	12760	Senior CCCF1 Q1 Disconn. device control block	Senior.CCCF...	Off	Generic process input
15	CCCH01_Q1:116	12761	Senior CCCF1 Q1 Disconn. open interlocked	Senior.CCCF...	Off	Generic process input
16	CCCH01_Q1:117	12762	Senior CCCF1 Q1 Disconn. close interlocked	Senior.CCCF...	Off	Generic process input
17	CCCH01_Q1:18	12752	Senior CCCF1 Q1 Disconn. command	Senior.CCCF...	Close executed	Generic process input
18	CCCH01_Q1:15	12753	Senior CCCF1 Q1 Disconn. device control block	Senior.CCCF...	Off	Generic process input
19	CCCH01_Q1:16	12754	Senior CCCF1 Q1 Disconn. open interlocked	Senior.CCCF...	Off	Generic process input
20	CCCH01_Q1:17	12755	Senior CCCF1 Q1 Disconn. close interlocked	Senior.CCCF...	Off	Generic process input
21	CCCH01_Q1:18	12756	Senior CCCF1 Q1 Cause of interlocking	Senior.CCCF...	0 Cause	Generic process input
22	CCCH01_Q1:19	12757	Senior CCCF1 Q1 Disconn. selection on monitor	Senior.CCCF...	0 Sessions	Generic process input
23	CCCH01_Q1:20	12758	Senior CCCF1 Q1 Disconn. command event	Senior.CCCF...	Off	Generic process input
24	CCCH01_Q1A:10	12763	Senior CCCF1 Short Circuit Indicator	Senior.CCCF1	Value 0	Generic process input
25	CCCH01_Q1A:110	12765	Senior CCCF1 Short Circuit Indicator	Senior.CCCF1	Normal	Generic process input
26	CCCH01_Q1A:18	12764	Senior CCCF1 Alarm indicator blodings	Senior.CCCF1	1 POS	Generic process input
27	HT	12776	(None)	(None)	(???) kvar	Generic process input

List field and Activation button	Description
Row Numbers	The row numbers are optionally shown in the beginning of the row.
Search bar	String criteria that are compared with text in all columns. The criteria may contain several query strings. A query string may include wildcards. For further information, see Selection of items.
Advanced Search bar	The row under the <i>Search</i> bar is an advanced search bar where the user can define column-specific selection criteria. Depending on the column, the criteria may consist of string, list, yes/no or time span condition.
Advanced Search bar list box	An advanced search bar list box for columns that can only include certain values. Select the criteria from the list. Only the items that meet the selected criteria will be accepted. Most lists with restrictions on the amount of data retrieved allows the user to enter string masks like that on the <i>Search</i> bar.
Advanced Search bar text box	A text selection box for text and figure columns. Enter a string mask similar to that used in the <i>Search</i> bar in the text box. String mask: Enter a string mask that will be compared with the column texts. The properties of string masks are explained in the search bar description Selection of items.
<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>	Yes/no criteria: Used for columns whose value is yes or no. Click to change the criteria. Each click changes the criteria to the following one. The criteria include the following: <input checked="" type="checkbox"/> : All items accepted (value Yes or No). <input checked="" type="checkbox"/> : Only items whose value is Yes are accepted. <input type="checkbox"/> : Only the items whose value is No are accepted.
Enable mask	Checkbox for time columns. If the checkbox has been selected, the bottom of the list displays a time bar where the user can select criteria for the time span. The time span is selected as described in Section 5.7. The left side of the interval row displays the column that the criteria are linked to.
Table continues on next page	

List field and Activation button	Description
Column headings	The descriptions of column headings are displayed at the bottom of the Properties dialog. For more information, see Section 4.6 .
Order indicator	Indicates the column on the basis of which the items are sorted. The list can be sorted by a maximum of five columns. A number displayed next to the triangle indicates the order in which the column is used in the sorting. The direction of the triangle indicates which of the following ways the items have been sorted by: Normal order: Ascending order = depending on the type of data in the column, an alphabetical or numerical order from smallest to largest (e.g. A-Z, 0-9). Reverse order: Descending order = depending on the type of data in the column, an alphabetical or numerical order from the largest to smallest (e.g. Z-A, 9-0). For information about sorting items by clicking the column headings of a single column, see Sorting list items using column headings . For information about sorting the items by several columns and by using the commands in the pop-up menu, see Sorting the list items using a popup menu .
Refresh	Refreshes the list data. In bigger lists, automatic refresh has been blocked. These list screens display a Refresh button that begins to flash when search criteria have been changed. In these cases, list refresh is activated with the Refresh button.
Edit	Moves the list into editing mode where the user can add and delete items and edit their information, depending on the list. Further information about the editing mode can be found in the SYS600 Historian Monitor Configuration manual.

6.2.2

Sorting list items using column headings

Click the column heading to sort the items based on a single column.

- Click the column heading based on the way the items should be sorted - for example, Name.
The sort indicator () is displayed in the heading, and the items are resorted. When the column is selected for the first time, the items are sorted in normal order.
- Click the same column again to sort the items in reverse order ().

6.2.3

Sorting the list items using a popup menu

- The primary sort (default sort) is always selected in the list. To sort the items by more than one column, select the following columns in numerical order:
 - the Secondary Sort
 - the Tertiary Sort option, etc.

To change the column used for a (primary, secondary, etc.) sort:

- Right-click the heading of the new column, and select the sort option (Primary Sort / Secondary Sort / etc.) and direction.
- Change the column used for primary sort by clicking the new column.

To change the sort direction of the column:

- Select the same sort option and a new direction.
- Change the direction of the sort column by clicking the column.

To delete a sort order:

- Clicking any column other than that used for primary sorting will make that column the primary sort column while other columns are preserved and the number of sort columns decreases by one (clicking the primary sort column changes only the sort direction).

6.2.4 Selection of items

Use the search and the advanced search bars to reduce the number of items displayed and to view only selected items. The user can search for a single item or an item group depending on the entered string criteria, the criteria selected in a list or other type of criteria. Only the items that meet all the criteria of the search and advanced search bars are displayed.

Different criteria on search and advanced search bars:

- Search bar: Defines the string mask that is compared with the texts in all columns. The string mask can consist of several query strings.

The query string has the following properties:

- The ? wildcard replaces one character.
- The * wildcard replaces zero or more characters. If automatic refresh is enabled, the number of variables (rows) displayed can be reduced by entering more characters in the query string between the two asterisks.
- If an asterisk (*) is entered as the first and last character in the query string, the string that meets the criteria may appear anywhere in the column. Otherwise, the string must be at the beginning and/or end of the column.
- When limiting numeric data, characters can be used to limit numbers based on values. These characters include:
 - equals (=)
 - bigger than (>)
 - smaller than (<)
 - bigger than or equal (>=)
 - smaller than or equal (<=)
- Vtrin will not add an asterisk at the end of the query string.
- Search for column texts that end in specific characters is also possible.
- The query string is case-insensitive.
- The string mask may include several query strings that have to or may not be included in the displayed items. Use commas (,) to separate query strings. Only exclusive query strings can be used in the advanced search bar. If they are used on the search bar, the string must be found in all columns in order to limit a row off.
 - If the query string should not be included in the search results, use an exclamation mark (!) or minus sign (-) in front of it and add it to the string mask. Exclusive query strings may also include asterisks.
 - The items selected are those that include one or all of the "positive" search criteria (the ones that do not begin with an exclamation mark or minus sign) and no "negative" criteria (the ones that begin with an exclamation mark or minus sign).
 - For example, the string mask string1,string2,!string3,!string4 means that string1 and/or string2 must be included, while string3 and string4 may not be included in any of the displayed items.
 - The following characters cannot be searched for - that is, they cannot be used in the query string: "*", "?" and ",". The following characters can be used in a query string but not as the first character: "!" and "-".
 - To avoid automatic refresh from causing too large of a load on the system, each keystroke is followed by a short delay before the system initiates a search. This allows the user to enter the entire string mask before the search begins.
- Advanced Search Bar: Includes string, list, yes/no or time span conditions related to the column below. All of the criteria in the selection boxes and the string criteria in the search bar are combined with an AND operator - that is, the displayed items must meet all the criteria, see the table in [Section 6.2](#).

Use the search and advanced search bars in the following way:

1. Enter the string mask in the search bar.
2. Enter the string mask in the string mask fields in the advanced search bar above the column names.
3. Select the required options for columns from the list criteria boxes on the advanced search bar above the column names.
4. Select the required options for columns from the yes/no boxes on the advanced search bar above the column names.
5. Select the required time spans for time columns by first selecting *Enable search* above the columns and then selecting the time spans from the time bars displayed at the bottom of the list.
6. If the list to print is short, Vtrin continuously monitors items as string criteria and select options are entered, and only displays the items corresponding to the criteria and options. When the refresh button is flashing, click Refresh to activate the selections and view the results.
7. When closing the list window, the content of the advanced search bar and the appearance of the window (e.g. column width) can be saved. The content of the search bar is not saved.
8. This enables the user to create a variable list that displays all floating-point variables for department X. From the variable list, the user can, for example, choose to view only variables with the character 'z' in some column by entering string mask *z* in the search bar. Closing the window does not change the original list.



The content of the advanced search bar can be saved when the list window is closed. The contents of the search bar are never saved.

6.3 Variable list

The variable list displays the database variables, which can be sorted on the basis of various data and search using different criteria. Users with sufficient authorization can also create, rename and delete variables.

6.3.1 Description

Open the variable list from the tree. The user can also create their own variable lists by editing the basic variable list, and place them anywhere in the tree. However, the default variable list will remain in the Variable lists folder inside the Maintenance folder. This folder contains pre-configured lists for different types of variables.

The information displayed in the list depends on the customer. To view the meaning of columns, click the variable in any column of the list (the current value column will not open). This will display the variable information (columns) one below the other in the **Properties** dialog. Clicking a row in the **Properties** dialog will display the explanation of the information (column) at the bottom of the dialog. For more information, see [Section 4.6](#).

[Section 6.2](#) explains how to sort the variables by different data fields and search them by different criteria.

6.3.2 Variable list

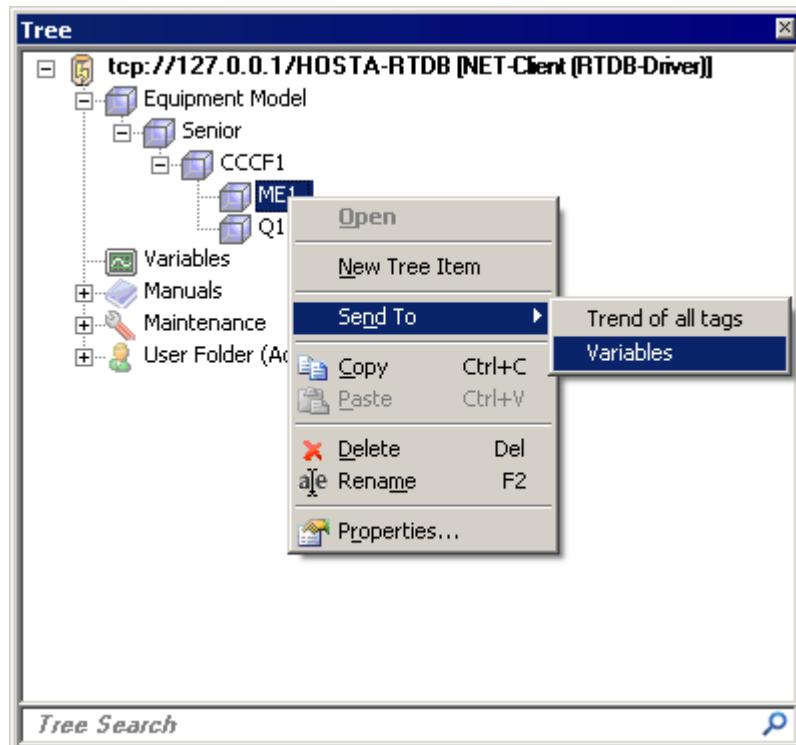
Variable list field	Description
	For descriptions of common list boxes (e.g. Search) see Section 6.2 .
Column headings	The descriptions of column headings are displayed at the bottom of the Properties dialog. For more information, see Section 4.6 .
Current value	The variable's current value and its status icon. These are not displayed in the Properties dialog because they are a combination of different database attributes. Status icons are described in a table in Section 4.11 .

Activation buttons	Description
	For descriptions of common buttons, see Section 6.2 .

Section 7 Equipment Model

Equipment Model is used to arrange information into a hierarchical structure and bind database objects, such as variables, to logical equipment instances. The hierarchical navigation helps to find information and open displays showing the equipment instance specific content.

The equipment hierarchy is in the Equipment Model folder. To open a display configured to a particular node (equipment instance or folder), right-click a node, select **Send To** and then the name of the display. In the example below, All signals from a single bay are sent to variable list.



Menu Terms	Description
Send To	Opens a variable specific pop-up menu from which a display type can be selected.
Status	The status window of a selected variable.
Trend	The default current trend of a selected variable.
Trend – AVG1minute	One minute average values of a selected variable (if collected).
Trend – AVG10minute	Ten minute average values of a selected variable (if collected).
Trend – AVG1hour	Hourly average values of a selected variable (if collected).
Copy	Copies the basic information of a selected variable.
Copy Selected Data	Copies the selected piece of information of a selected variable.
Delete	Deletes the selected variable from the database.
Properties	Opens the Properties window of a selected variable.

Section 8 Status window

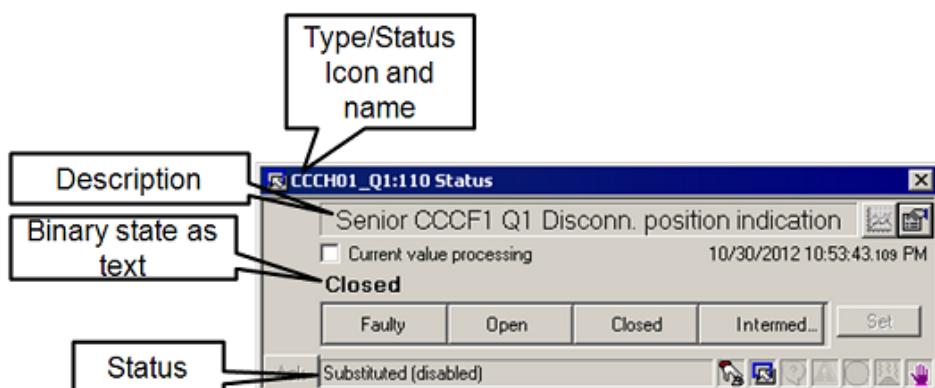
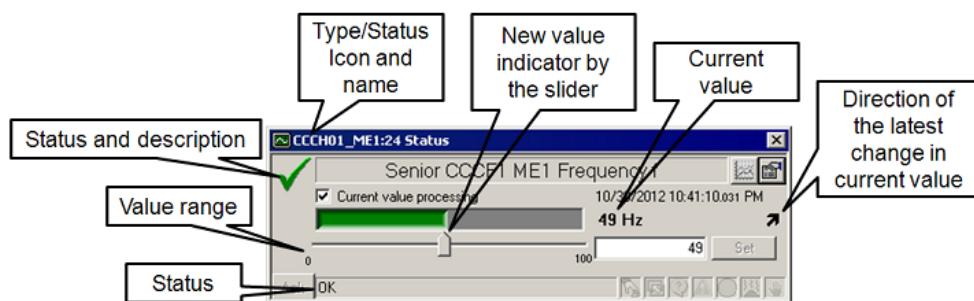
The variable's Status window displays the current value of the selected database variable. The variable can also be removed from current value processing in the Status window and replaced with a different value.

8.1 Description

The window displays the variable's name, description, current value and status, unit, time stamp, and status both as an icon and as text. The title bar displays an icon corresponding to the variable's type when the status is OK, and a status icon in other cases.

The variable can be removed from current value processing and give it a new current value. To define a floating-point variable, move the slider to the required value or enter a figure in the box. In the case of binary variables, select a value by clicking a value button.

8.2 Display



Field	Description
Type icon	A variable-type icon on the left of the title bar, if the variable's status is OK.
Status icon	Icon representing the variable's status. Displayed on the left of the description. If the status is not OK, the status icon is displayed on the left of the title bar, which otherwise displays the variable's type icon. Status icons are described in a table in Section 4.11 . In the case of binary variables, the window displays the symbol of the binary state, which is usually defined so that its color indicates the (quality) status and its form the value.
Name	Name of variable. Displayed in the title bar.
Description	Description of variable. Displayed below the title bar.
Current value processing	If selected, the value from the process is used for the variable. If not selected, the value is used for the variable.
Time	Time stamp for the current value.
Value	Current value. In the case of binary variables, the binary state as text.
Unit	The engineering unit of the value in the database.
	Indicator of the direction of change. The arrow indicates the direction of the latest change in the current value of the floating-point variable: ↗ : Increasing value ↘ : Decreasing value ↕ : Unchanged value
	The new value of the floating-point variable indicated by the slider. A new value is entered either by moving the slider or by entering a figure in the box. The left end of the line represents the minimum value in the range, and the right end the maximum value. The range is also displayed as a ToolTip text when the cursor is positioned in the slider area.
	New value for floating-point variable as a figure. A new value is entered either by moving the slider or by entering a figure in the box. For binary variables the new value can be set by clicking a button presenting the new value.
Status	The variable's status in text format. Displayed at the bottom of the window.
Status icons	The variable's valid states are displayed at the bottom of the window using colored icons. Status icons are described in a table in Section 4.11 .

Activation button	Description
	Displays the Properties dialog of the variable.
	Makes the variable's new current value displayed in the box (floating-point variables) or in value buttons (binary variables).

8.3 Opening the Status Window

- Right-click any other column than the current value or chart window legend.
- Choose **Send To** and then **Status Window**.

8.4 Setting the value of a process variable or a calculated variable

1. Remove the variable from current value processing in the **Current value processing** checkbox.
2. Select a new value for the floating-point variables by using the slider or by entering a new value in the box. In the case of binary variables, select a new value by clicking appropriate value button.
3. Set the value as the current value by clicking **Set**.
4. The variable's status changes to replaced. The new value remains the variable's value until a new value is manually set or **Allow current value processing** is set in the Status window. The variable begins to receive values from the process or the spreadsheet application.

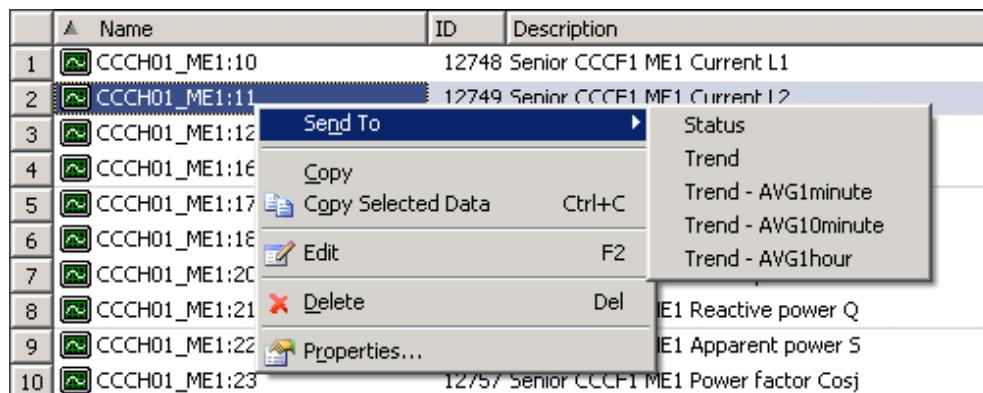
Section 9 Default trends

The variable's default trend enables the user to, for example, use the variable list to open a chart window displaying the variable's plot.

9.1 Description

The default trend is a chart window defined for the variable, which displays the variable's plot. A variable may have several default trends that retrieve the information for plots from different time levels. For example, from the current value or one minute average value history.

9.2 Opening a default trend



- Right-click any column other than the current value or the legend in the chart window.
- Select **Send To** and the required default trend.



Do not replace the default trend so that the original default trend will not be lost.

Section 10 Using templates

A template contains certain properties and the layout of a chart window. Using the appropriate template to create a new chart window enables the user to quickly create a functional window complying with the agreed standard by simply adding the required graphs.

10.1 Description

It is easy to create a new template-based chart window. Just follow these three steps:

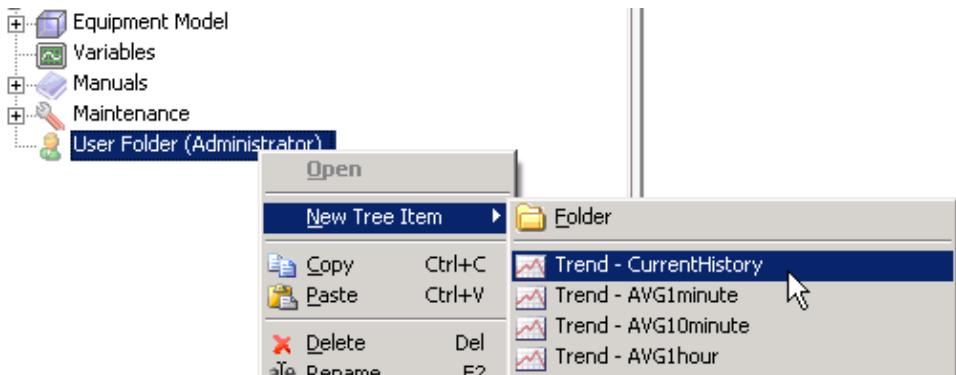
1. Using an appropriate template, create a new chart window in the tree's folder and open it.
2. Open the variable list or another chart window that displays the variable rows in its legend (the two methods lead to slightly different results). See [Section 10.2](#)
3. Drag the required variables from the variable list or from the legend of the chart window to the legend or chart of the new window.

For more detailed instructions, see [Section 10.2](#)

For more information on creating chart windows and defining the properties of chart items, such as plots, see the SYS600 Historian Monitor Configuration manual.

10.2 Creating a chart window using a template

- Right-click the tree's folder in which a new chart window should be created. Choose **New Tree Item** and the required template.



Using a template	Description
User Folder (%Username%)	Select the folder into which a new chart should be created.
New Tree Item	Opens the template pop-up menu.
Trend -	Select a template to be used.

- The folder will display a new chart window item, with the name New and the name of the selected template. Enter an appropriate name for the window.
- Open the new chart window.
- Add graphs to the chart by dragging a variable from the variable list or a variable row from a legend of another chart window. In terms of the determination of plot configurations, these two methods differ in the following way:

When dragging variables from the variable list, the graph definitions comply with the template defaults and the graph color with the order of addition. When dragging variable rows from another chart window, the graph definitions comply with the original graph.



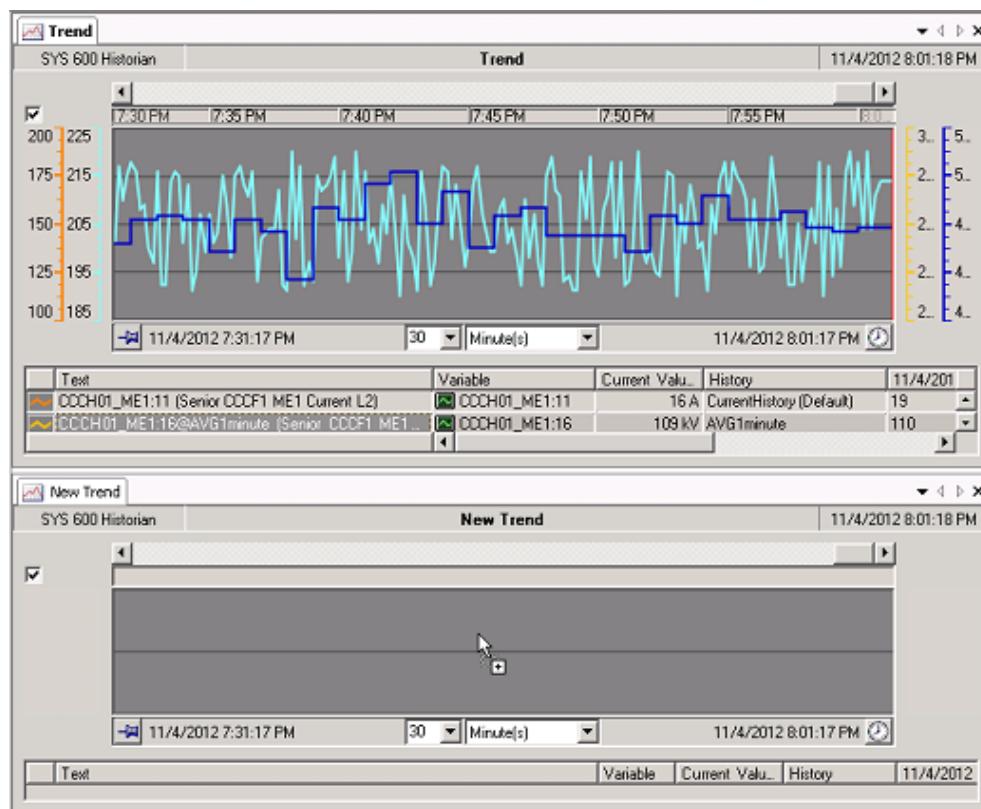
When dragging a variable or variable item from another database, the default definitions are not copied along with the variable. In this case the history table for the new item has to be updated from the **Properties** dialog.

Adding graphs from a variable list:

1. Open the variable list. To simultaneously view both the list and the chart window, move the variable list to a new horizontal tab by opening the Window menu in the menu bar and selecting **Move to a New Horizontal Leaf**.
2. In the variable list, locate the variables to be added to the chart. The easiest way to find variables is by using search criteria in the search bar and in selection boxes. For more information, see [Section 6.2](#).
3. Select the variable row (by clicking) and drag it to the chart window's legend or the chart (plot area).
4. Several variables can also be selected one by one by pressing the CTRL button and holding it while selecting variables.
5. Add the rest of the graphs in the same way. The graph definitions comply with the default settings of the template.

Adding graphs from the legend of the chart window:

1. Open the chart window where the properties of the graphs are displayed in the legend rows. To simultaneously view both the list and the new chart window, move the chart window to a new horizontal tab by opening the **Window** menu in the menu bar and selecting **Move to a New Horizontal Leaf**.
2. Drag the variable row from the chart window's legend to the legend or the graph area of the new chart window.



- Add the rest of the graphs in the same way. Graphs can also be added from several chart windows. The definitions of the added graphs (e.g. the color and the table where the history values are retrieved from) will be similar to those of the chart they originated from. The addition of graphs does not affect the chart window interval.

If the user wants to change the properties of the graphs added to the chart of the new window, such as the colors and graph styles, it can be done in the chart's **Properties** dialog. For further information, see the SYS600 Historian Monitor Configuration manual.

Save the chart window when prompted to save changes.

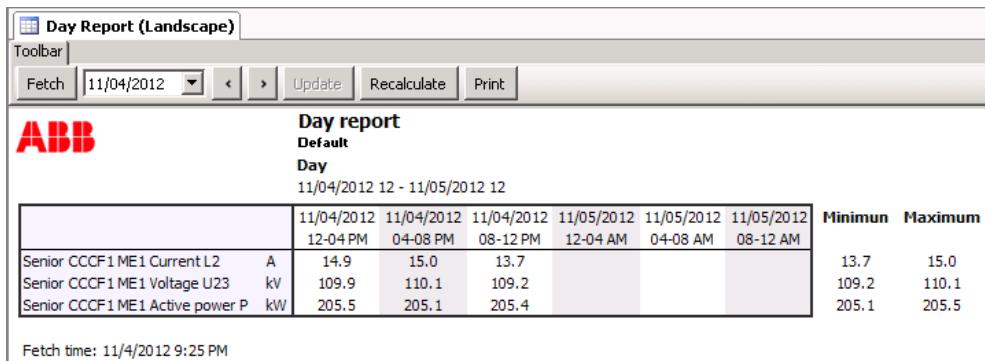
Section 11 Standard report

11.1 Presentation of the report

When the report is configured and opened in Vtrin's display it looks like the model below.

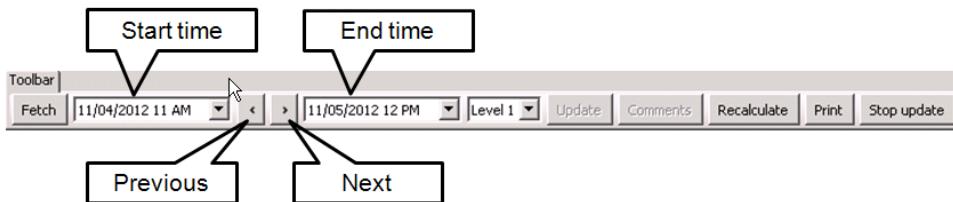
	Senior CCCF1 ME1 Current L2 A	Senior CCCF1 ME1 Voltage U23 kV	Senior CCCF1 ME1 Active power P kW	Senior CCCF1 ME1 Frequency f Hz
11/04/2012 12-01 PM	14.9	110.3	205.8	49.5
11/04/2012 01-02 PM	14.9	109.5	206.1	49.6
11/04/2012 02-03 PM	14.8	110.1	205.1	49.5
11/04/2012 03-04 PM	15.0	109.8	204.9	49.5
11/04/2012 04-05 PM	15.2	110.2	205.0	49.5
11/04/2012 05-06 PM	14.9	110.0	205.4	49.4
11/04/2012 06-07 PM	14.9	109.8	204.9	49.5
11/04/2012 07-08 PM	15.1	110.2	205.1	49.6
11/04/2012 08-09 PM	14.8	110.4	204.7	49.4
11/04/2012 09-10 PM	14.9	109.5	203.3	49.4
11/04/2012 10-11 PM				
11/04/2012 11-12 PM				
11/05/2012 12-01 AM				
11/05/2012 01-02 AM				
11/05/2012 02-03 AM				
11/05/2012 03-04 AM				
11/05/2012 04-05 AM				
11/05/2012 05-06 AM				
11/05/2012 06-07 AM				
11/05/2012 07-08 AM				
11/05/2012 08-09 AM				
11/05/2012 09-10 AM				
11/05/2012 10-11 AM				
11/05/2012 11-12 AM				
Minimun	14.8	109.5	203.3	49.4
Maximum	15.2	110.4	206.1	49.6
Fetch time: 11/4/2012 9:11 PM				

Values are presented in the report either in vertical columns (as above) or in horizontal rows (as below). In the presentation of the values, formatting and additional data are used to express the fitness and representativeness of the values.



11.2 Report template toolbar

Report template has always toolbar visible when it is in normal use. All items are not visible all the time.



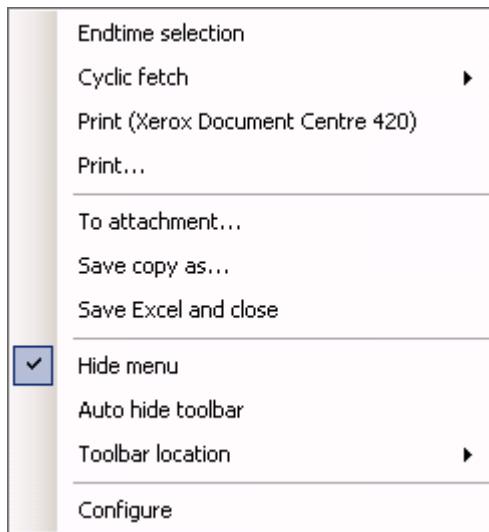
Toolbar items	Description
Fetch	Fetch activates the reading for a selected time period. Reading must be activated by user if the Report Auto setting is not in use.
Start time	Start time is always visible. Start time is inclusive, which means that periods that are equal or greater than the start time are included. Start time can be entered manually or selected from a pop-up calendar. Selected date can also be changed with the arrow keys. Start time is always rounded down to the closest period start based on a defined report period configuration.
Previous	The Previous button reduces the time from the previous selected start and end time. Reduced time is defined in level settings. The button also activates reading if the Report Auto setting is in use.
Next	The Next button adds time to the previous selected start and end time. Added time is defined in level settings. The button also activates reading if Report Auto setting in use.
End time	End time can be hidden when it is calculated. End time is exclusive, which means that periods less than end time are included. End time can be entered manually or selected from a pop-up calendar. Selected date can also be changed with the arrow keys. End time is always rounded down to the closest period end based on a defined report period configuration.
Level	Level selection is visible if more than one level is defined in the report. When other levels are selected for the first time, a default fetch time is calculated.

Table continues on next page

Toolbar items	Description
Update	<p>Update button is always visible but normally disabled. Updating values from report is supported when the following requirements are met:</p> <ul style="list-style-type: none"> • Item maintenance is allowed in report configuration • Maintenance of updated period is allowed • User has user rights to update variables and the history table in question • History table period length matches the report period length (for example, one hour table can be updated only with a one hour repost period length) <p>Values are updated by entering a new value to each period. Clearing old value is done by deleting the existing value. Avoid unnecessary deletions as those are rarely needed.</p> <p>If all update requirements are met, the report background color changes to that of a valid updated period and the Update button is enabled. Values are not updated into database unless the user activates the maintenance by clicking the Update button. Updating also has different modes which effect the protection of the values or how changes affect to next period. If the user is not familiar with the options, the default update parameters should be used.</p>
Comments	<p>Comments button is visible only if it is selected from report configuration. Like the Update button, the Comments button is disabled unless the user makes updates. Comments button does not directly send updated values into the database, but opens Comments dialog. Comments entered from the report are not visible in the report but in the Vtrin history maintenance log.</p>
Recalculate	<p>The Recalculate button opens a recalculation dialog. Recalculation activation is often needed by users who changes values manually. Recalculation also requires certain user authorization.</p>
Print	<p>The Print button opens the report printing settings if a report template sheet is active. The active report sheet is printed to default printer which can be seen from the ToolTip. If the user wants to use another printer, the Print dialog can be opened from the Report toolbar menu.</p>
Stop update	<p>Stop update is visible only if cyclic fetch is activated from the Report toolbar menu. The toolbar shows the next fetch time. Stop update cancels cyclic fetch. Cyclic fetch may also be stopped due to other user actions.</p>

11.3 Report template toolbar menu

Report template has a menu that can be accessed by right-clicking the Report toolbar.



Toolbar menu items	Description
Endtime selection	Endtime selection enables the use of reports in fixed or in free length mode without changing the default settings. Normally, the report level is configured as fixed length, for example one day. Selecting Endtime selection from menu activates the endtime component and enable free length mode.
Cyclic fetch	Cyclic fetch activates the automatic reading of report values. Fetch cycle interval is configured in report configuration, but the function is activated by selecting one of the following choices: <ul style="list-style-type: none">• Default: each time the reading is activated, the fetch times are calculated by default time rules for the level.• Keep distance to current time: makes the end time visible. When cyclic fetch is started, the report time is calculated from the first period in the report to the current time. Each time the reading is activated, the same time difference is targeted. This feature is normally used so that the user selects the most interesting time periods, for example the current hour as well as other periods in the reports. When cyclic fetch is activated, it will keep the current hour visible to the user at all times.• Previous time interval: no new fetch times are calculated, reading same periods as in the previous fetch.
Print Print...	Selecting Print will print the active worksheet using the default printer. Selecting Print... opens the printing dialog, where the user can define the printing parameters before printing. Both of these features are report printing settings available if a report template sheet is active.
To attachment ...	Fetched results can be saved in Excel file form, which can be attached to an email. The created file includes the template report results from the last fetch without any functionality, and it includes all worksheets from the report. Selecting To attachment... opens the Save as dialog for user to check filename and location.
Table continues on next page	

Toolbar menu items	Description
Save copy as...	Save copy as... function enables copying the current report configuration to a new Vtrin tree item. No files are saved, only the report configuration. The Vtrin tree dialog is opened for the user to select a tree item under which the new item is created.
Save Excel and close	Template report supports using a separate Excel file if needed. It is recommended to make changes to the Excel file as usual by using Excel directly. However, an Excel file can also be opened in write mode in Vtrin. Because template report adds worksheets (template and charts) and pictures (logo) to Excel, it is recommended to remove extra items before saving changes to the Excel file. Template report adds those extra items every time the file is opened while any possible old fetch results will not be removed.
Hide menu	Hide menu setting hides the Excel menu. As a default, the Excel menu is not visible. The setting is applied only to the current Vtrin session and is not saved. Microsoft does not support hiding Excel menu, but this setting is activated when a report is opened.
Auto hide toolbar	Auto hide toolbar hides the Template report toolbar. The setting is applied only to the current Vtrin session and is not saved.
Toolbar location	Template report toolbar can be located either on top or to the left with Toolbar location. The setting is applied only to the current Vtrin session and is not saved.
Configure	Selecting Configure opens the Report configuration dialog. Access to the configuration dialog can be limited if the user does not have sufficient authorization.

11.4 Presentation of value in the report

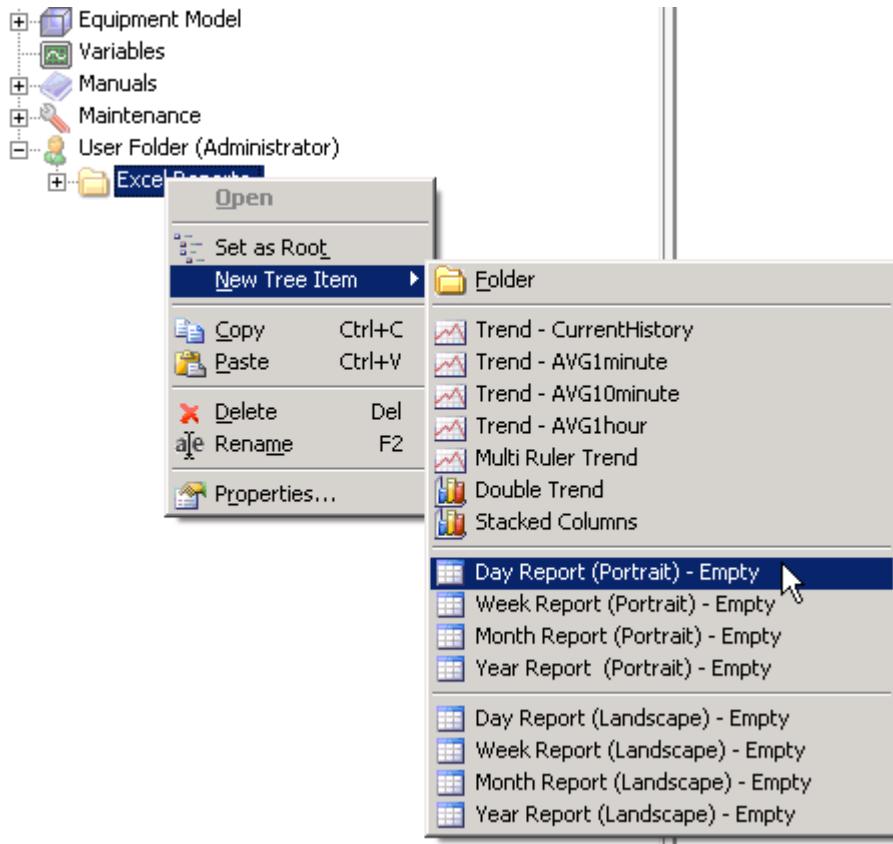
When the representativeness setting is activated from the Configure dialog, a percentage is displayed if the value is not zero [0%] or one hundred [100%].

	Senior CCCF1 ME1 Current L2 A	Senior CCCF1 ME1 Voltage U23 kV	Senior CCCF1 ME1 Active power P kW
11/04/2012 10-11 AM	14.6# [42.5%]	110.1# [41.7%]	205.7# [41.7%]
11/04/2012 11-12 AM	14.8 [92.5%]	110.2 [91.7%]	205.8 [91.7%]
11/04/2012 12-01 PM	14.9	109.9	205.9
11/04/2012 01-02 PM	14.8	109.8	205.6
11/04/2012 02-03 PM			
11/04/2012 03-04 PM			
11/04/2012 04-05 PM			

If the validity of a value is less than the configured limit value in report (settings in Configure dialog), value is marked to invalid (magenta and number sign (#)).

11.5 Creating a report using a template

Right-click the tree's folder in which a new report should be created. Choose **New Tree Item** and the required template.



- The folder will display a new report item with the name prefix New and the name of the selected template. Enter an appropriate name for the report.
- Open the new report.
- Add variables (columns) to the report by dragging a variable from the variable list. When variables are dragged from the variable list, the report definitions comply with the report template defaults.
- Save the report when prompted to save changes

The report configurations, such as deleting a variable and changing column width can be done with the Configure dialog from Report toolbar menu. For further information, see the SYS600 Historian Monitor Configuration manual.

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