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GRID AUTOMATION PRODUCTS

# **MicroSCADA X SYS600 10.2**

## Historian Monitor Configuration







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# Section 2      Introduction

## 2.1      This manual

This manual provides information on how to configure and customize the SYS600 Historian user interface. The configuration can be done both when the system is designed and at runtime.

## 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 Operation	1MRK 511 474-UEN
SYS600 10.2 Operation Manual	1MRK 511 499-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

# Section 3 Configuring the Tree

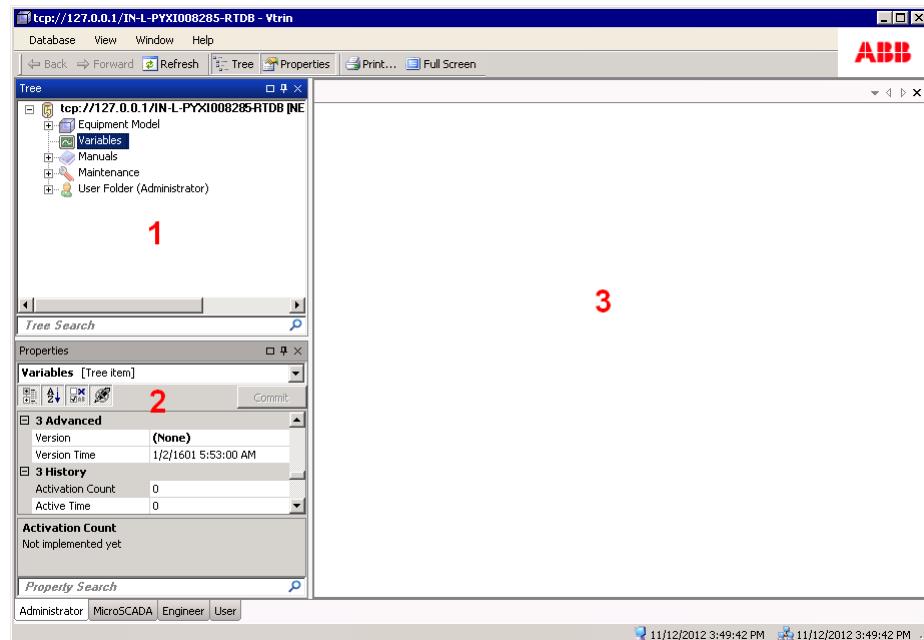
The tree can be configured with the pop-up menu that opens by right-clicking an item. The pop-up menu enables the user to create, copy, and delete folders and nodes (items), change their names etc. The items can be moved to another location in the tree by dragging. The items can be copied, moved and shortcuts can be created from item by dragging the item to a different location in a tree while holding the right mouse button. Releasing the button in the desired location will open up a window, where the user can choose either to copy, move or create a shortcut.

This section describes the following tasks:

- ["Basic UI components"](#)
- ["To set tree properties"](#)
- ["To set tree items properties"](#)
- ["Tree Items List Window"](#)
- ["To create a new folder"](#)
- ["To create a new node from a template"](#)
- ["Moving, Copying, and Deleting Tree Items"](#)
- ["To move folders and nodes by dragging with the left mouse button"](#)
- ["To copy folders and nodes with Copy and Paste"](#)
- ["To delete folders and nodes"](#)

## 3.1 Basic UI components

The [Figure 1](#) shows how the Vtrin looks like after being successfully connected.

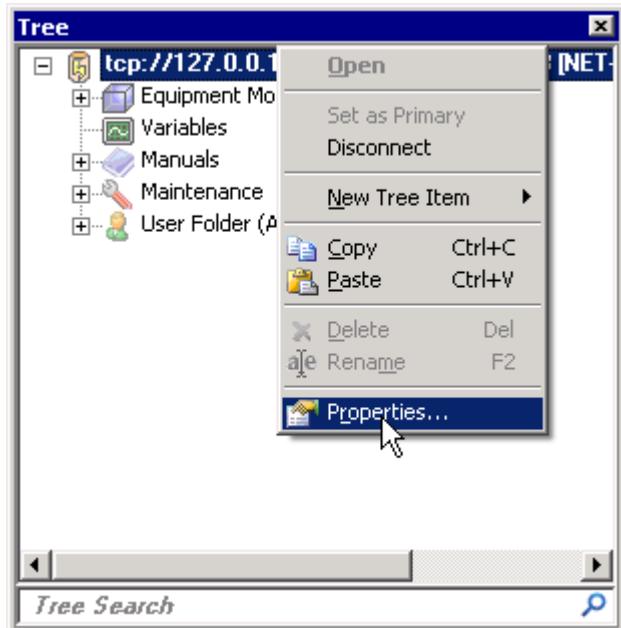


*Figure 1: SYS600 Historian has been connected successfully using Vtrin user interface with user with administrator credentials. The main components are main menu, toolbar, tree (1), generic properties window (2) and area for the components opened from tree (3, current blank).*

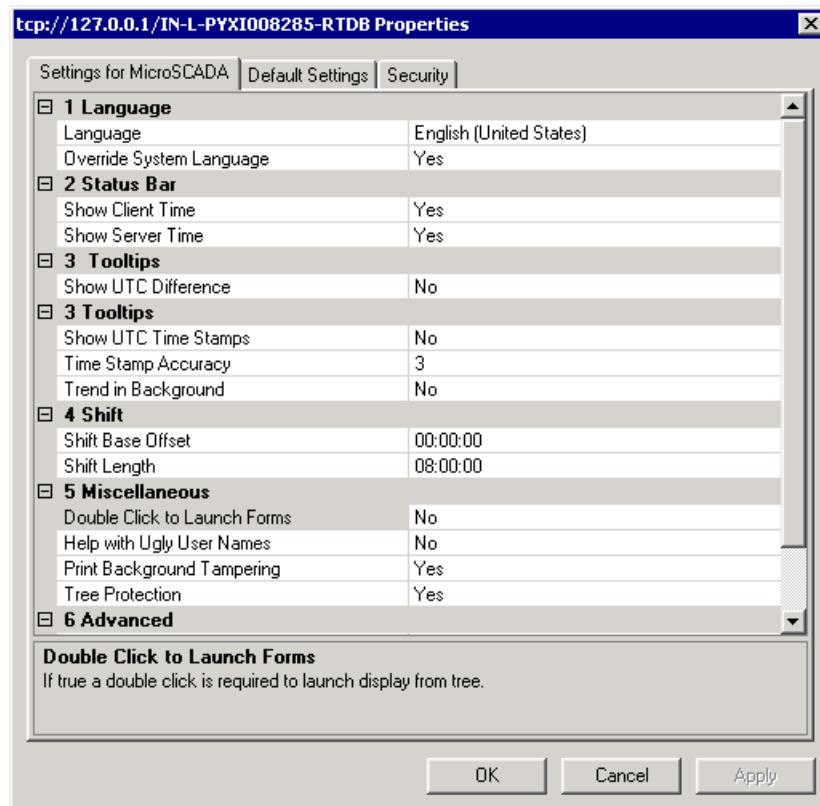
The components on the layout can be dragged, dropped and pinned for different locations as usual. When a user interface component is selected from tree view, it is opened in the blank area. Clicking the Variables tree item opens a list display of the variables that are currently available in the database.

## 3.2 To set tree properties

Access the Vtrin main tree by choosing **Properties** from drop-down menu by right-clicking the tree root.



These properties are defined in three separate tabs:



- Setting for ... : These are the user specific settings. The settings are divided in five groups:
  - Language: Used language
  - Status Bar: Choose the Client and/or Server time to be shown in the bottom of the mainview.
  - Tooltips: Define the specific setting for the Tooltips.
  - Shifts: Define the default base offset and length for shifts.
  - Miscellaneous: Define if double-clicking is used to open forms, if domains' full usernames are used and if tampering with the background printing area is allowed.
- Default Settings: Default settings can be modified from this tab.
- Security tab: See [Section 3.3.3](#).



Changes in the parameters take effect after Vtrin has been restarted.



It is not recommended to change miscellaneous settings as it may lead to unstable behavior of the Vtrin client.

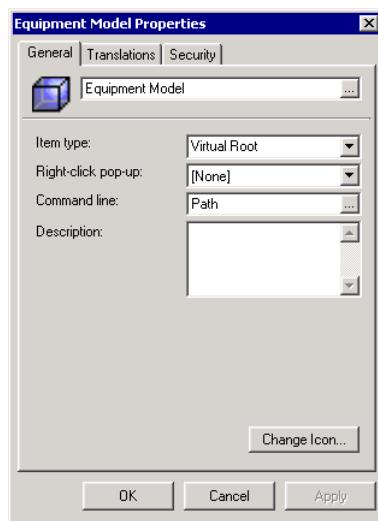
### 3.3 To set tree items properties

To open Properties, press the right mouse button and choose Properties from the drop-down menu. The **Properties** dialog consists of three tabs: General, Translations and Security.

### 3.3.1 General Tab

On the **General** tab the user can define the basic attributes of the item. These attributes include:

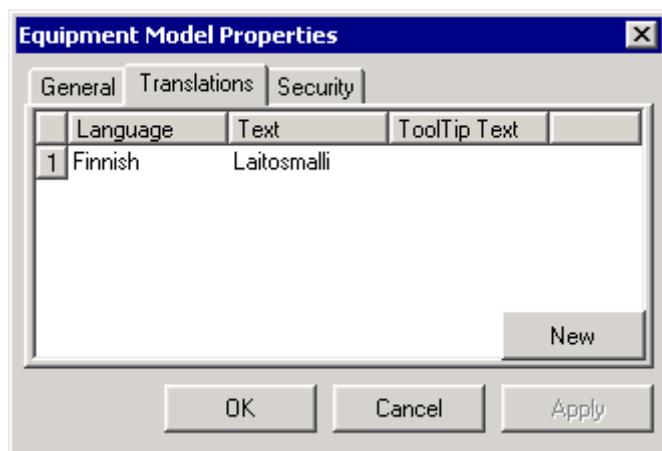
- Item type: Select the item type from the drop-down list.
- Right-click pop-up: Select whether or not the item has a right-click pop-up menu.
- Base form: Select the Base Form from the drop-down list.
- Form type: Select the Form type from the drop-down list.
- Command line: Type the Command line or click ellipsis button to open a dialog box for browsing.
- Description: Type here the text for the item's ToolTip.
- **Allow multiple instances of this form:** Check this to enable the item to have several instances.
- **Change Icon:** Click here to open a dialog box for browsing for a new icon for the item.



### 3.3.2 Translations Tab

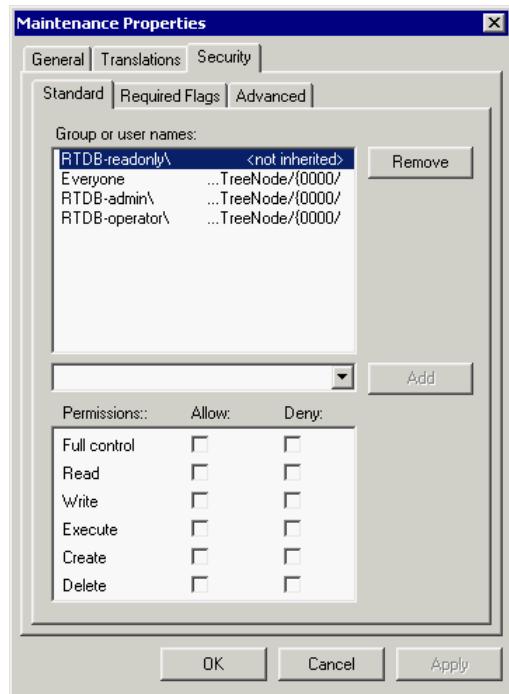
Localize the tree item's name and ToolTip information on the **Translations** tab. This is done by using three different variables:

- LangId: Choose the language from the drop-down list, or by type the language in the text field.
- Text: Click to open a text box to edit the item's name. Click **OK** to close the text box.
- LongText: Click the ellipsis button to open a text box to edit the item's ToolTip information. Click **OK** to close the text box.
- Once the changes have been made, confirm them by clicking **Apply**.

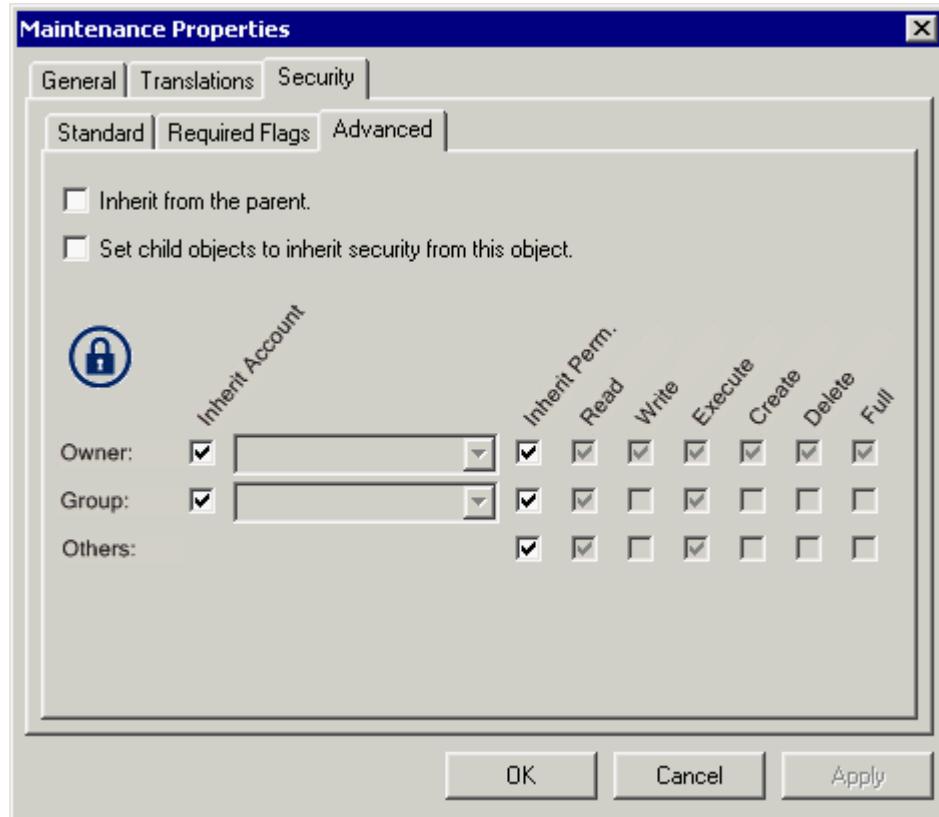


### 3.3.3 Security Tab

Set the security preferences for the item on the **Security** Tab. There are three subtabs for security preferences.



- **Standard Tab:** The standard security settings.
- **Required Flags Tab:** Not applicable.



- **Advanced Tab:**

- **Inherit from the parent:** Checking this means that the item will inherit its security preferences from the parent folder.
- **Set Child to Inherit permissions from this object:** Checking this means that the child items of this folder will inherit these security preferences.
- Set the individual security preferences for different user groups:
  - **Owner:** Check the Inherit box next to the drop-down menu to inherit the owner from the parent folder. If the Inherit box is not checked, the correct owner can be chosen from the drop-down menu.
  - **Group:** Check the Inherit box next to the drop-down menu to inherit the group from the parent folder. If the Inherit box is not checked, the correct group can be chosen from the drop-down menu.
  - **Others:** Others are everyone that are not part of the chosen Owner or Group.
  - **Inherit Perm.:** Check this to set the item to inherit the security preferences of the Owner, Group or Others from the parent folder.
  - **Read:** Check this to enable reading the item.
  - **Write:** Check this to enable editing the item.
  - **Execute:** Check this to enable opening the item.
  - **Create:** Check this to enable creating an item.
  - **Delete:** Check this to enable deleting an item.
  - **Full:** Check this to give full rights.

## 3.4 Tree Items List Window

The **Navigation Tree Items** list window shows the tree items and their properties as a list. It can be used, for example, to find the location of a missing window if some information about, e. g. it part of its name, is known.

To view the list of tree items with their properties:

- Open the Navigation Tree Items window ([Figure 2](#)) in the Maintenance/System/Vtrin folder.
- Use a suitable mask, for example a part of the item name, in the selection box above the Name column.

Note that there may be several items with the same name in the tree. Differentiate by checking the parent folder in the Parent Folder column and, if necessary, the parent folder of that, and so on. (None) in the parent folder column means that the item is a top level folder, directly in the database root.

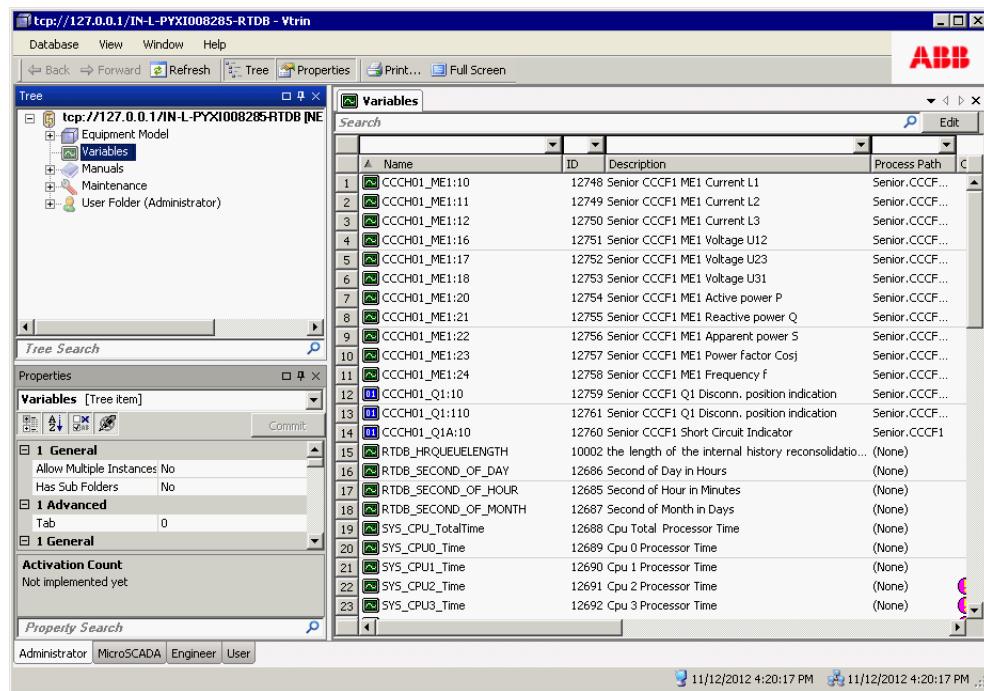


Figure 2: Tree Items window

For more information about user roles, see SYS600 Historian Configuration and Administration manual.

[Figure 2](#) illustrates that the parent folder of one of the items called Variable Lists is System. Variables Lists itself is a window of type Folder.

## 3.5 Creating Tree Items

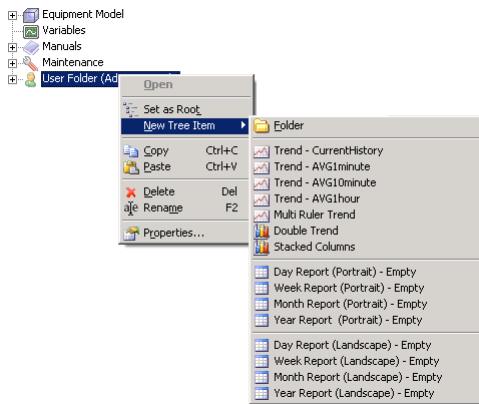
### 3.5.1 To create a new folder

- Right-click the icon or the folder name where the new folder should be created and click **New Tree Item** and then **Folder**.
- Type a name for the new folder (by default, New Folder).

### 3.5.2 To create a new node from a template

- Right-click the icon or name of the folder where the new window should be created and click **New Tree Item**. Select the suitable template.  
A template is a collection of controls, for example chart, legend, ruler, etc., with a specified layout and properties. Templates are used as the basis when creating chart windows.  
There are two kind of chart window templates:
  - Master templates that can be copied. If the master is changed, the copy will remain unchanged.
  - Templates that inherit the master templates. If the master is changed, the copy will inherit the changes. Using these kinds of templates ensure that all windows in the system have a uniform layout.

Inheritance does not apply to list templates.



*Figure 3: Creating a window from a template*

- Type a name for the new window, which has the default name New + name of the template.
- To configure the window, for example specify variables and how they are displayed for chart windows or select the information shown for list windows, see the appropriate section.

## 3.6 Moving, Copying, and Deleting Tree Items



Protection against dragging the tree items by mouse is enabled by default. To disable Tree protection, hold down the CTRL key while dragging the item.

### 3.6.1 To move folders and nodes by dragging with the left mouse button

Move folders or windows to another location in the tree by dragging. A folder is moved with its contents.

- To move the item between two other items, hold down the CTRL key and drag its icon or name until the black line is in the correct position. Release the icon.
- To move the item in a folder, hold down the CTRL key and drag its icon or name on top of the folder until the folder name is highlighted. Release the icon.

### 3.6.2 To copy, move, or create a shortcut by dragging with the right mouse button

Copy, move or create a shortcut for an item by holding down the CTRL key and dragging the item with the right mouse button.

- Select the item with the right mouse button.
- Move the cursor to the desired location while holding down the CTRL key and the right mouse button. The correct position is shown with a black line in the list or by highlighting the target folder.
- Release the right mouse button. A window will appear, from where the desired action can be chosen.

### 3.6.3 To copy folders and nodes with Copy and Paste

Copying folders or windows to another location in the navigation tree and then modifying them as necessary often saves a lot of work compared to creating them from scratch.

- Copy always uses the saved tree item. Therefore, if changes are made to a window and the user wants to copy the new version, the window has to be saved before starting the copying.
- Right-click the icon or the name of the folder or window to be copied and click **Copy** to copy the selected item to the clipboard. A folder is copied with its contents.
- To copy the item to another data source, connect to the appropriate data source.
- Right-click the icon or name of the folder to which to copy the item. Click **Paste** on the pop-up menu to paste the item in the clipboard to the selected folder. A folder is pasted with its contents. The item remains in the clipboard and it can be copied to other folders with **Paste**, if necessary.

When copying a group of windows that have mutual links, the links in the copied windows point to the original windows. Change the links in the copied windows to point to the copies of the original windows.

When copying items to another data source, note that the links still point to the windows in the source database.

### 3.6.4 To delete folders and nodes

Right-click the icon, the name of the folder or the node and click **Delete**. A folder is deleted with its contents. Confirm the deletion in the confirmation dialog box.



**Delete** does not delete the possible links in other nodes to the node that is being deleted. The links have to be deleted separately.

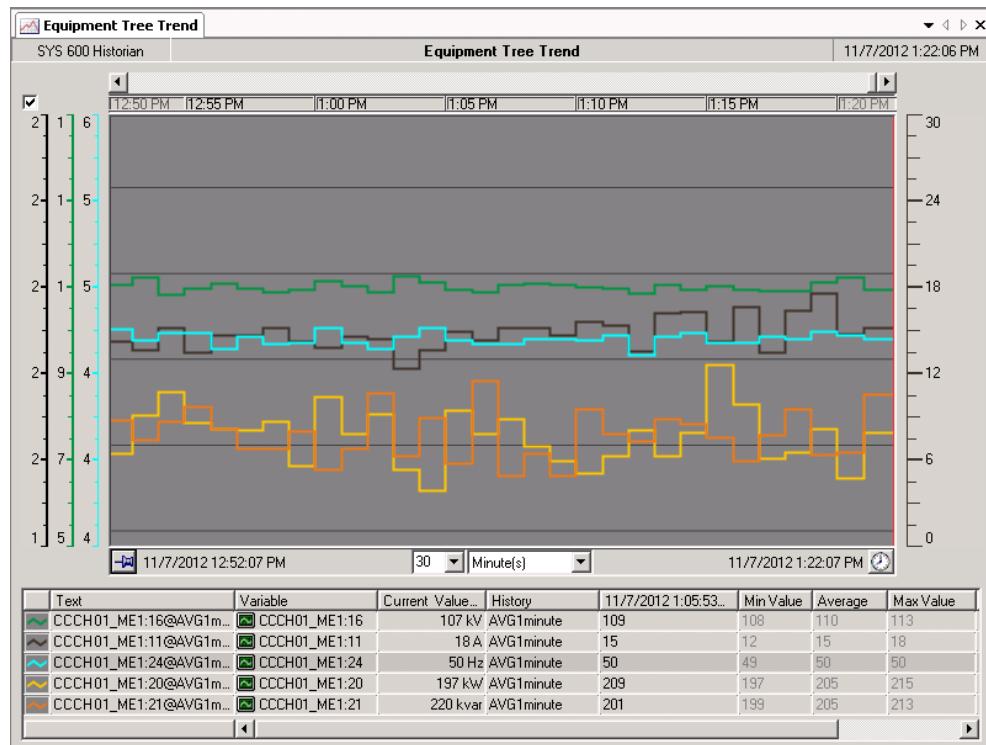


# Section 4 Configuring Chart Windows

After creating a chart window node in the tree as described in [Section 3.5.2](#), the chart window can be configured.

This section describes the following tasks:

- ["Inserting graphs into chart windows"](#)
- ["Graph properties"](#)
- ["Specifying information shown in the legend"](#)
- ["Changing graph properties in the legend"](#)
- ["Deleting graphs from chart windows"](#)



*Figure 4: Chart Window Example*

## 4.1 Inserting graphs into chart windows

To insert graphs into chart windows:

- Open the chart window by clicking the chart node.
- There are three ways to insert graphs to chart windows. The determination of the graph properties of the inserted graphs is different in these cases.
- Drag variables from the **Variables** list to the legend or to the chart: The data fetch and graph properties to the new graph are copied from the defaults of the target chart. Graph colors follow the default color order.

- Open the **Variables** list window from the **Maintenance** folder. To view it at the same time as the chart window, move the **Variables** list window to a new leaf by clicking **Move to a New Horizontal Leaf** on the **Window** menu.
- Find the variables to be insert to the chart on the list.
- Select the variable row, and drag and drop the variable to the legend or to the chart.
- Insert other variables in the same way.

OR

Drag a graph specific row from the legend of another chart window to the legend or to the chart:

The data fetch and graph properties (including color) are copied to the new graph from the source graph.

- Open a chart window where the graphs to be inserted are shown as graph specific rows in the legend. To view the source and target chart windows at the same time, move the source chart window to a new leaf by clicking **Move to a New Horizontal Leaf** on the **Window** menu.
- Drag the graph specific legend row of the source chart window to the legend or to the chart of the target chart window.
- Insert other graphs in the same way. Several graph rows can be inserted at the same time if necessary.

OR

Insert graphs in the **Properties** dialog:

The data fetch and graph properties are copied from the chart's default settings. Graph colors follow the default color order.

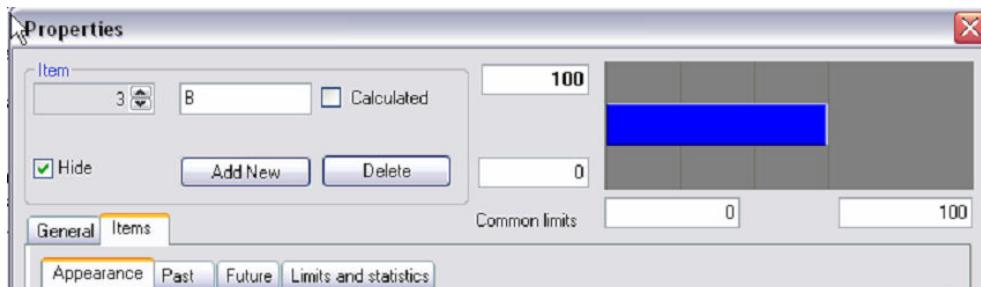
To add new graphs to the chart in the **Properties** dialog, see [Section 4.2](#).

For all cases:

- Save the settings when closing the chart window.

## 4.2 Graph properties

To specify graph properties:



*Figure 5: Properties dialog for graphs*

Graph properties can be specified in the chart **Properties** dialog.

- Open the **Properties** dialog by right-clicking the legend row of the desired item and click **Properties**.
- OR by right-clicking the chart, selecting **Properties** and then selecting the graph item by clicking the up/down arrows in the upper left corner of the **Properties** dialog.
- In the **Properties** section, the chosen graph is presented in a preview window. Add or remove variable accordingly:
- **Add New:** Allows the user to insert a new graph item to the chart.
- **Delete:** Allows the user to delete the selected graph.
- **Hide:** Checking this box the user can make the graph invisible on the chart.
- **Common limits:** Give limits to the graphs shown in the chart by typing the minimum and maximum values to the text fields.

- **Apply:** Click Apply to commit the changes.
- : Click the up/down arrow to commit the changes and to get the next/previous graph of the chart.
- : Calculation name of the graph.
- **Calculated** check box allows the user to display graphs that are calculated on the basis of chosen variables. See [Section 4.2.7](#).

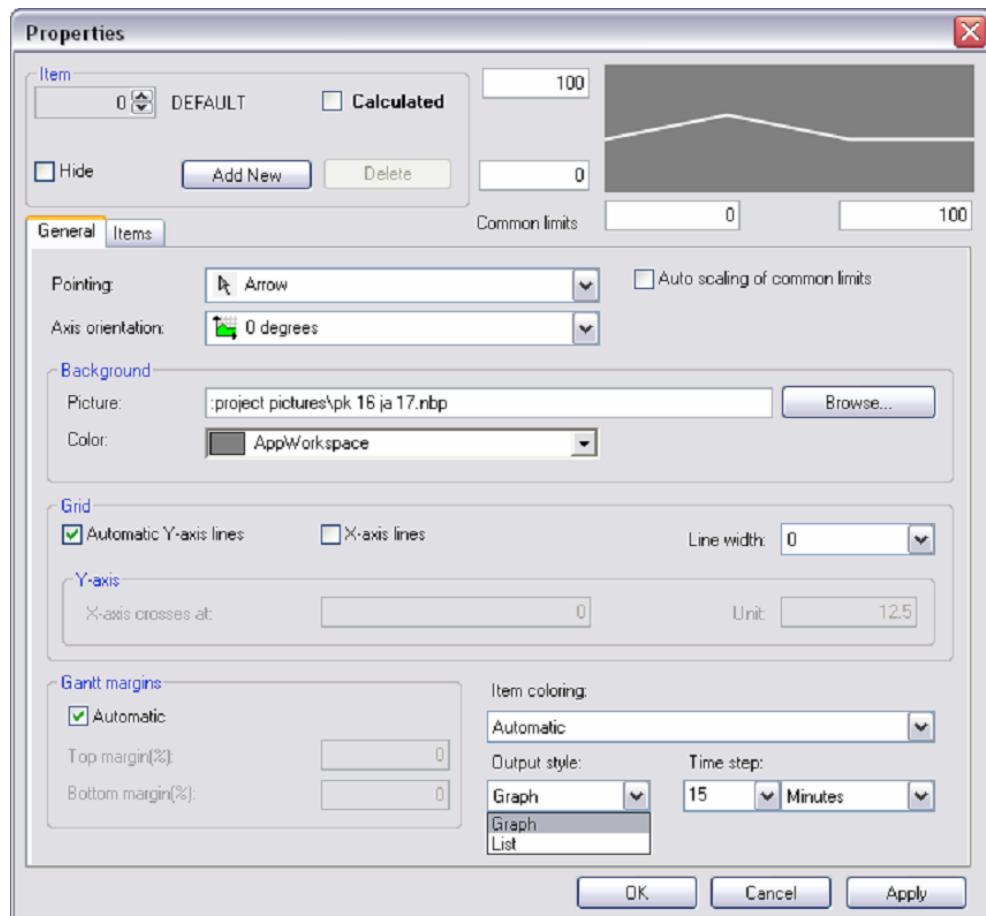


Figure 6: Properties dialog for graphs – General tab

## 4.2.1 General tab

Specify general properties for the chart, for example background picture and chart grid, on the **General** tab.

- **Pointing:** Select the pointer shape by choosing the desired pointer from the drop-down list.
- **Auto scaling of common limits:** Select this to use automatic values to set the common limits for the graphs.
- **Axis orientation:** Choose either X or Y axis along which the chart is drawn. Use this, for example, in process charts.
- **Background:** The user can either select a background picture or one solid color for the graph's background.
  - When selecting a picture, click **Browse** to open the picture choosing dialog. The picture must be located in a shared folder so that all users can locate it from the

- path /DATA/VtrinShared/Project pictures. Clearing the textbox will remove the chosen picture from the background.
- When selecting a color, select the color from the drop-down list. There are three different categories of color on the list.
  - Grid:** Create gridlines to help visualize the changes on the graph.
    - Automatic Y-axis lines:** Select to use automatic Y-axis lines.
    - X-axis lines:** Select to use automatic X-axis lines.
    - Line width:** Choose the gridline width from the drop-down list.
    - Y-axis:** Determine the size of the gap between gridlines.
      - X-axis crosses at:** Specify one specific value that crosses with the X-axis gridline. This option is not yet supported.
      - Unit:** The number of gridlines is the Common limits value divided with this number. For example if Common limits is set as 100 and the Unit number is set as 25, the number of gridlines is 4.
  - Gantt margins:** Gantt margins are set automatically as default, but they can also be set manually by giving values to Top margin and Bottom margin.
  - Graph Coloring:** Specifies how the coloring of the graphs is specified. Useful if several time bars with specific colors are used. Choose the color from the drop-down list. The color selection applies only to the trend line.
  - Output style:** Choose to display the data either as a graph or in list format.
  - Time Step:** Determines the time scale used in the graph.

#### 4.2.2 Items tab / Appearance tab

Graph properties are specified on the **Items** tab. There are seven subtabs under the **Items** tab. These are: **Appearance**, **Past**, **Future**, **Past 2**, **Future 2**, **Advanced** and **Limits and Statistics**.

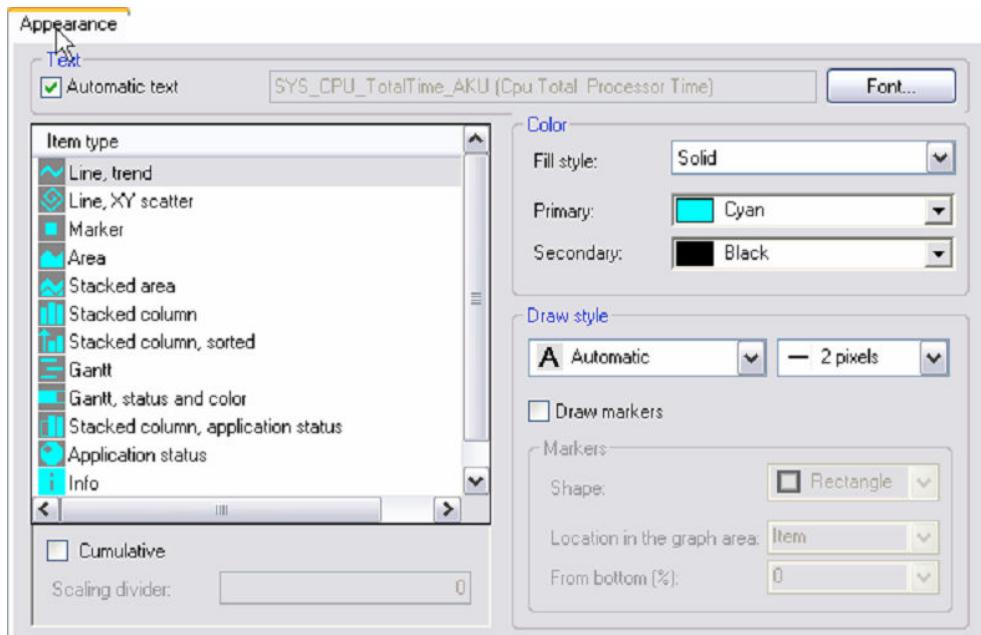


Figure 7: Properties dialog for graphs -Appearance tab.

On the **Appearance** tab, the user can specify, for example, the graph type (e.g. line trend or stacked column) and the graph color and draw style.

- **Automatic text:** If selected, the variable description is shown automatically in the Text column of the legend. Otherwise, the text entered in graph specific text field is shown.
- **Text field:** Graph specific text shown in the legend.
- **Font....:** Opens the **Font** dialog, where dialog the font of the graph row in the legend can be defined.
- **Graph type:** Specifies the selected graph type (e.g. line trend or stacked column).
- **Color:** Defines the used color and style for each separate graph.
  - **Fill style:** Choose the fill style from the drop-down list.
  - **Primary:** Choose the Primary color for the graph from the drop-down list.
  - **Secondary:** Choose the Secondary of the two-colored fill style from the drop-down list.
- **Draw style:** Defines Draw type for the line trend, area, stacked area and the line XY-scatter. Different Draw types can be chosen from the drop-down list. Choosing the size of the line and the markers of the graph is done from the drop-down list. The size range is between 0 and 8 pixels.
- **Draw markers:** Checking this will display the markers in the graph. Only fetched points are marked. The opening options allow the user to specify the shape of the marker when it is presented and the markers location while the graph type is marker.
- **Markers:**
  - **Shape:** Choose the marker's shape from the drop-down list.
  - **Location in the chart:** This can only be modified if **Markers** is the chosen Graph type. Location in the chart is chosen from the drop-down list.
  - **From bottom:** If the chart location is set as **User specific**, set the distance as a percentage from the chart height can be set. This can be done by typing the percentage in the provided text box, or by choosing the value from the drop-down list.
- **Cumulative trend** is only used while the Graph type is **Line trend** or **Area**.
  - **Cumulative:** Select this option to display the graph in a cumulative way, where each value is added to the ones before. The value is formatted back to zero after each defined period (defined in the chart element).
  - **Scaling divider:** Type here the scaling factor that is used as a divider to convert the values to the required unit.
- **Gantt status state:** Gantt status state is only used while the graph type **Gantt** is defined. When the user selects graph type **Gantt, status and color**, the parameters and color for the specific Gantt state in the chart can be specified. The definitions apply to all the Gantts in the picture. The first valid color selection defines the color.

### 4.2.3 Past tab

Values in the **Past** tab are preconfigured and do not usually need to be modified.

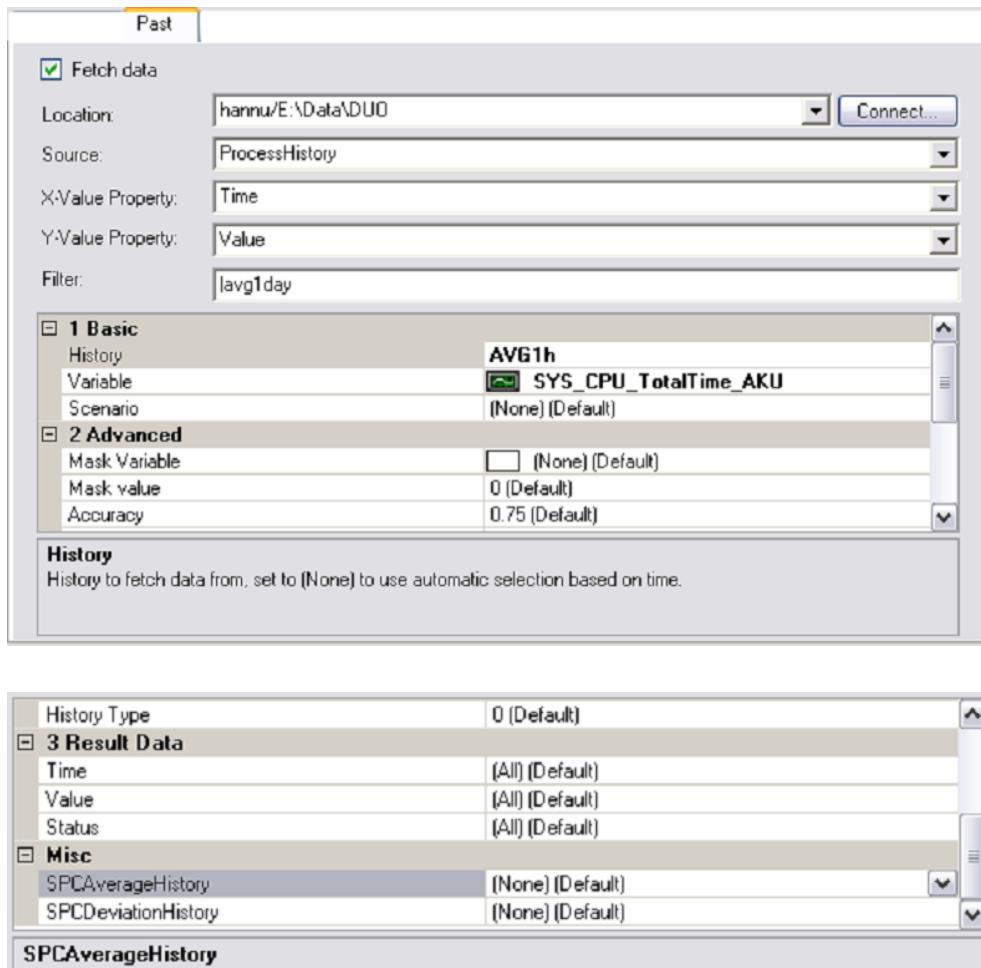


Figure 8: Properties dialog for graphs – Past tab.

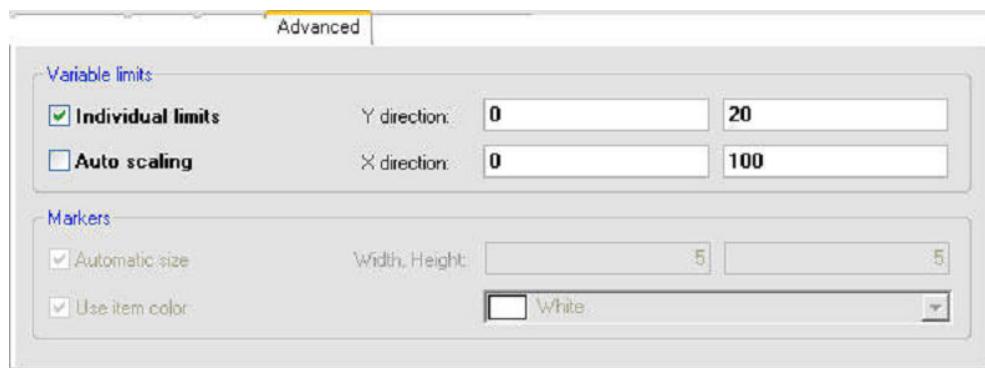
On the **Past** and **Past 2** tabs, the fetch parameters of the graph shown in the chart presenting the past time can be specified. **Past 2** is only used while the Graph type is either Line, XY scatter or Stacked column, sorted. It is used, for example, when information is fetched from the history stored in SYS600 Historian.

- **Fetch data:** If selected, the graph data to the past chart is fetched.
- **Location:** Choose the database to connect to from the drop-down list.
- **Connect:** Connect to a new database.
- **Source:** Choose the category of the variables from the drop-down list.
- **X-Value Property:** Choose the property of the X-value from the drop-down list. This is usually time.
- **Y-Value Property:** Choose the property of the Y-value from the drop-down list. This is usually value.
- **Filter:** Enter the filtering criteria, for example a history table name. If there is no string in the filter area, no filter is in use.
- **Parameters:** Use drop-down lists to choose the parameters for the graph.

## 4.2.4 Future tab

**Future** and **Future 2** features are not supported.

## 4.2.5 Advanced tab



*Figure 9: Properties dialog for graphs – Advanced tab.*

Specify the variable scaling limits and the marker properties for the proper graph types on the **Advanced** tab.

- **Variable limits:** Set individual scaling limits for each graph.
- **Individual limits:** If this is selected, the chosen graph uses individual scaling limits instead of the chart's common scaling limits specified at the top of the **Properties** dialog.
- **Auto scaling:** Selecting this will define the suitable individual scaling limits dynamically.
- **Y direction:** Variable individual scaling limits on Y-axis.
- **X direction:** Variable individual scaling limits on X-axis (limits of the X-variable of an XY-graph).
- **Markers:** Set the individual markers settings for every graph. This option is available if the **Markers** are set to be individually defined in the **Appearance** tab.
- **Automatic size:** Selecting this means that the marker size is counted automatically from the drawing type pixels.
- **Width, Height:** Type in the graph's individual Width and Height.
- **Use graph color:** If selected, the marker color is same as the graph color. If this is not selected, choose the color from the drop-down list.

## 4.2.6 Limits and statistics tab

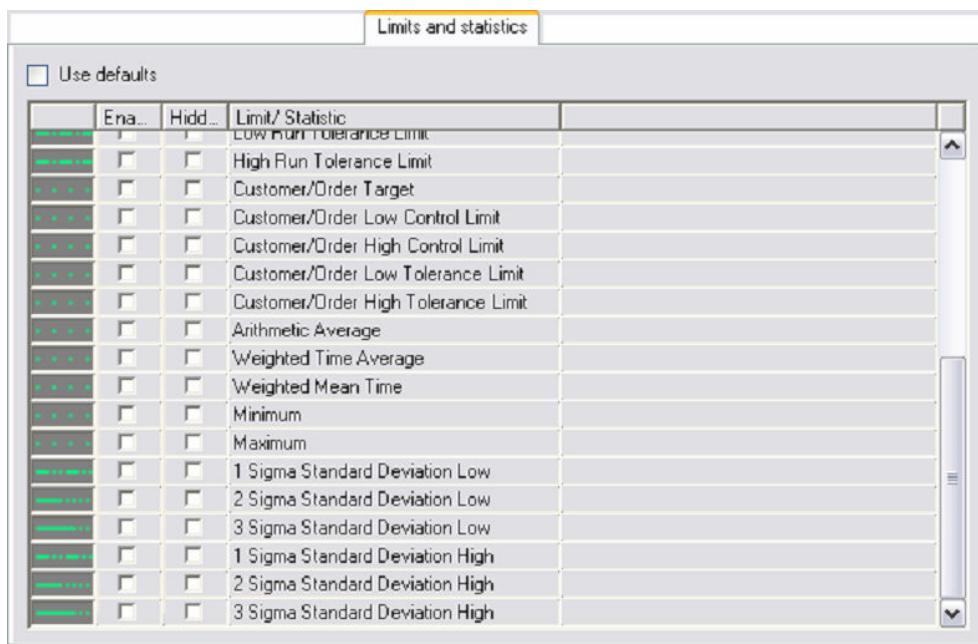


Figure 10: Properties dialog for graphs – Limits and statistics tab.

Set additional limits and statistics for the graph on the **Limits and statistics** tab.

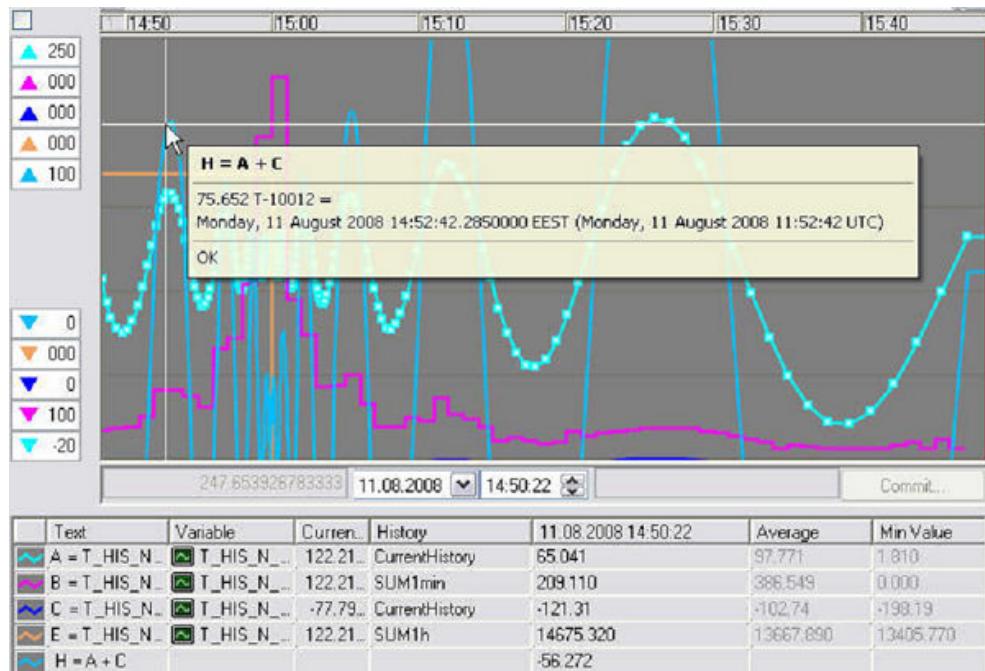
- **Use defaults:** Checking this means that default graph limits and statistics are used.
- **Enabled:** Check this to take the chosen limit/statistic in use. Once this is checked, the chosen limit or statistic will be visible on the chart.
- **Hidden:** Checking this will hide the chosen limit/statistic in the chart.
- Sigma limits are calculated using selected tables of historical averages and deviations. The tables are found under **Past/Misc/SPCAverage History/SPCDeviation History**. For more information, see [Section 4.2.3](#).

## 4.2.7 Calculation tab

To use this tab, choose **Calculated**. The X-expression is only used when the Graph type is either Line, XY scatter or Stacked column, sorted.

An example of defining a chart item:

Properties dialog	Choose <b>Calculated</b>
Calculation tab	Insert formula.
Appearance tab	<p>Choose <b>Automatic text</b> Press <b>Apply</b> Click the up/down arrow to go to the next or the previous item. Click the up/down arrow to go back to the calculated item. Disable <b>Automatic text</b> Write the text &lt;Calculation name&gt;=&lt;calculation formula&gt; in the text field. The calculation formula is already created by the previous procedure. For the items used in the calculation formula, the basis for the text field can be created following the steps as described above. Add the text &lt;Calculation name&gt;=&lt;item variable information&gt; in the text field, where the item variable information has already been created.</p>

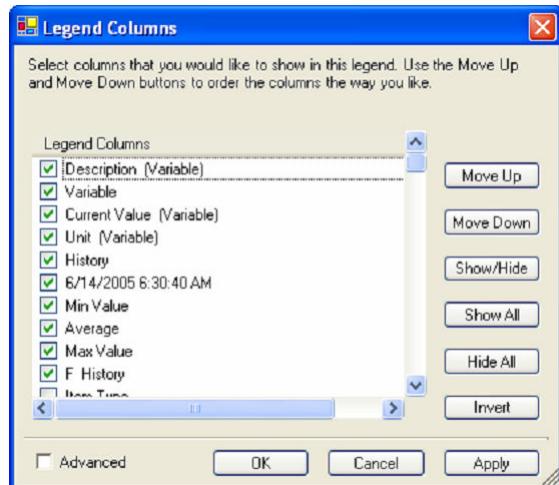


## 4.3 Specifying information shown in the legend

The data available for the legend is determined by the data sources specified in the chart definitions. Specify the information shown on the graphs in the **Legend Columns** dialog box. The information is displayed in the legend columns.

	Description (Variable)	Variable	Current Valu...	Unit (Va...)	History	5/16/2006 12:54:4...	Min Value	Average	Max Value
⊕	Cpu Total Processor Time	SYS_CPU_TotalTime	22.0	%	CurrentHist...				
⊖	Cpu 1 Processor Time	SYS_CPU1_Time	33.1	%	CurrentHist...	32.2	0.8	30.5	48.4
⊕	Handled Count in Ring	SYS_DVMC_HandledCount_in_Ring	7	pc.	CurrentHist...	17	0	18	1023
⊕	Total Count in Ring	SYS_CVMC_TotalCount_in_Ring	37	pc.	CurrentHist...	3	0	13	70
⊕	Total Disk Time	SYS_DISK_Time	0.4	%	CurrentHist...	1.2	0.2	13.3	100.0

- Right-click anywhere in the legend. If the chart window has more than one legend, make the specifications separately for each legend. Right-click a legend to specify the information shown in that particular legend.
- If some limits and statistics are set to the graph, they will be visible in the legend as subcategories under the graphs. Click the + to open the category for viewing.
- Click **Legend Columns...** on the pop-up menu to open the dialog box.



*Figure 11: Legend Columns dialog box*

On a chart, a single plot item can comprise the data of one or two past and future time parameter sets including, for example, the variable and history table from which the variable data is retrieved. As the column headings are often the same, an additional clarification letter related to the heading is used to specify the data source.

The headers in the legend columns start with the clarification letter as follows:

- The chart fetch area information:  
P2 = Past2 area parameters  
F = Future area parameters  
F2 = Future2 area parameters  
Past area parameters are shown without clarification letters.
- The graph specific information:  
I2 = Past2 + Future2 area parameters  
The past + Future area parameters are shown without the clarification letters.

For Example, Identifier, Name, Alias, Current Value and Current Value Unit are specified separately for the variables of the fetch area.

Variable/F Variable is associated with every graph type and P2 Variable/F2 Variable is associated with the Line XY Scatter and the Stacked Column Sorted styles.

For XY-graphs, Variable/F Variable is the Y-variable and P2 Variable/F2 Variable is the X-variable. For sorted stacked columns, Variable/F Variable is the variable defining the height of the column and P2 Variable/F2 Variable is the variable telling in which order the columns of different column series' are displayed vertically on top of each other.

- Specify which parameters are shown and hidden by directly selecting and clearing the check boxes or by clicking the buttons listed below, which selects or clear check boxes. A selected check box shows the parameters of the row in the legend, a cleared check box hides it.
  - **Show/Hide:** Shows/hides the information of the highlighted row (i.e. row that has first been selected by clicking it).
  - **Show All:** Shows all parameters.
  - **Hide All:** Hides all parameters.
  - **Invert:** Hides all selected parameters (with selected check boxes) and shows all unselected parameters (with cleared check boxes).
- Order the information in the legend columns by selecting the row in the **Legend Columns** dialog box and then clicking the following buttons:
  - **Move Up:** Moves the highlighted parameters upwards in this dialog box, i.e. left in the legend.
  - **Move Down:** Moves the highlighted parameters downwards in this dialog box, i.e. right in the legend.
- Save the settings when you close the chart window.

## 4.4 Changing graph properties in the legend

Edit the graph properties with the function buttons in the upper part of the legend's pop-up menu. The following settings can be edited:

- Item visibility
- Item type
- Marker type
- Scaling limit type
- Item fill style
- Color settings

Note that the edit options apply to either:

- one (selected) graph
- all the selected graphs (for example hide, marker)
- the general chart view (background color)

Function button	Functions
	Item visibility/Invisible Shows the visibility status currently in use. To change the status, press the button.
	Item visibility/Visible Shows the visibility status currently in use. To change the status, press the button.
	Item type Shows the item type currently in use. To change the item type, press the button.
	Item type options <ul style="list-style-type: none"> <li>• Line, trend</li> <li>• Line, XY scatter</li> <li>• Marker</li> <li>• Area</li> <li>• Stacked area</li> <li>• Stacked column</li> <li>• Stacked column, sorted</li> <li>• Gantt</li> <li>• Gantt, status and color</li> <li>• Stacked column, application status</li> <li>• Application status</li> <li>• Info</li> <li>• Separator</li> </ul>
	Marker type Shows the marker type currently in use. To change the marker type, open the pop-up menu by clicking the arrow in the right corner and choose the appropriate marker.
	Marker type options <ul style="list-style-type: none"> <li>• No marker</li> <li>• Rectangle</li> <li>• Diamond</li> <li>• Triangle</li> <li>• Ellipse</li> <li>• Diagonal cross</li> <li>• Cross</li> <li>• I-Beam</li> <li>• Vertical</li> <li>• Horizontal</li> </ul>

Table continues on next page



Scaling limit type

Shows the scaling limit type currently in use. To change the limit type, open the pop-up menu by clicking the arrow in the right corner and choose the appropriate limit type.

Scaling limit type options

- Individual
- Automatic
- Common



Properties

Click Properties to open the Properties window.



Item fill style

Shows the item fill style currently in use. To change the item fill style, open the pop-up menu by clicking the arrow in the right corner and choose the appropriate fill style.

Fill style options

The pop-up shows the fill style options and the icons related to these options.

- 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):

- 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.

## 4.5 Deleting graphs from chart windows

To delete graphs from chart windows:

- Right-click the legend row of the graph to be deleted and click **Remove....**  
OR
- Open the **Properties** dialog by right-clicking the legend row of the graph to be deleted and click **Properties**. When the dialog box is open, select the graph by clicking the arrow buttons.
- Make sure that the selected graph is really the one to be deleted and click the **Delete** button at the top. Click **Apply**.

# Section 5 Configuring List Windows

After creating a list window in the tree as described in [Section 3.5.2](#), the list can be configured.

This section describes the following tasks:

- ["Properties dialog"](#)
- ["Open list window"](#)



The UI word Mask has been changed to the word Search in all the lists. You can find the word Search in the selection box.

Name	Description	Current Value	Unit	Source	Value Type	Process Path
LOAD_A1_000	Load A1 test_000	10.00	C	Generic process input	Floating point...	(None)
LOAD_A1_001	Load A1 test_001	10.00	C	Generic process input	Floating point...	(None)
LOAD_A1_002	Load A1 test_002	39.05	C	Generic process input	Floating point...	(None)
LOAD_A1_003	Load A1 test_003	40.05	disc	Generic process input	Floating point...	(None)
LOAD_A1_004	Load A1 test_004	74.00	disc	Generic process input	Floating point...	(None)
LOAD_A1_005	Load A1 test_005 j... t...	46.25	lin	Generic process input	Floating point...	(None)

Figure 12: List Window Example

## 5.1 Properties dialog

To specify the list properties:

- Open the list window.
- If the template used is a general list template with no source (table) specified, the list is empty. In that case, right-click the empty list area and click **Properties**. Otherwise, right-click the column header.

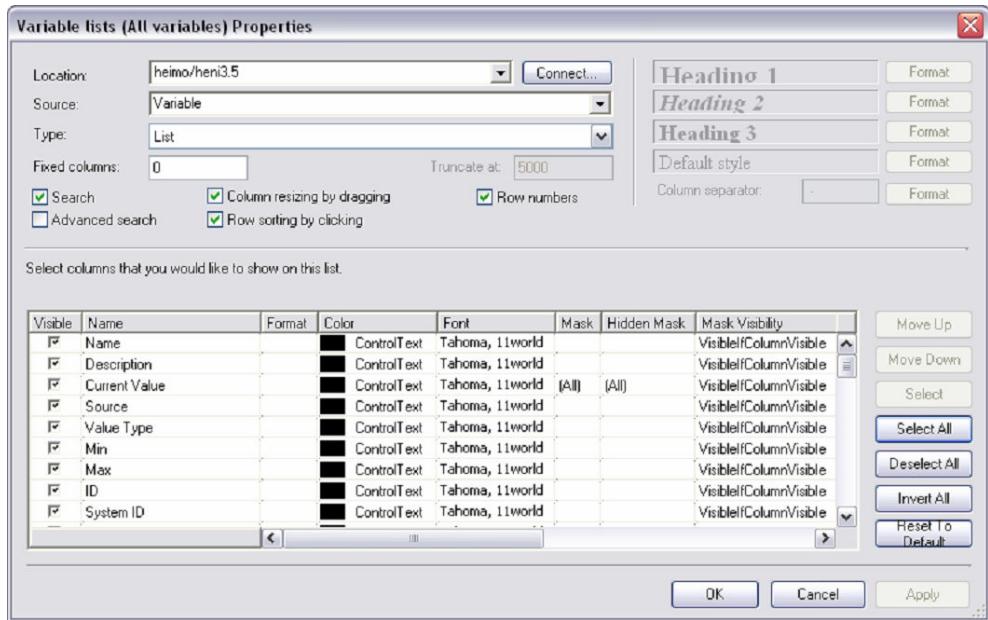
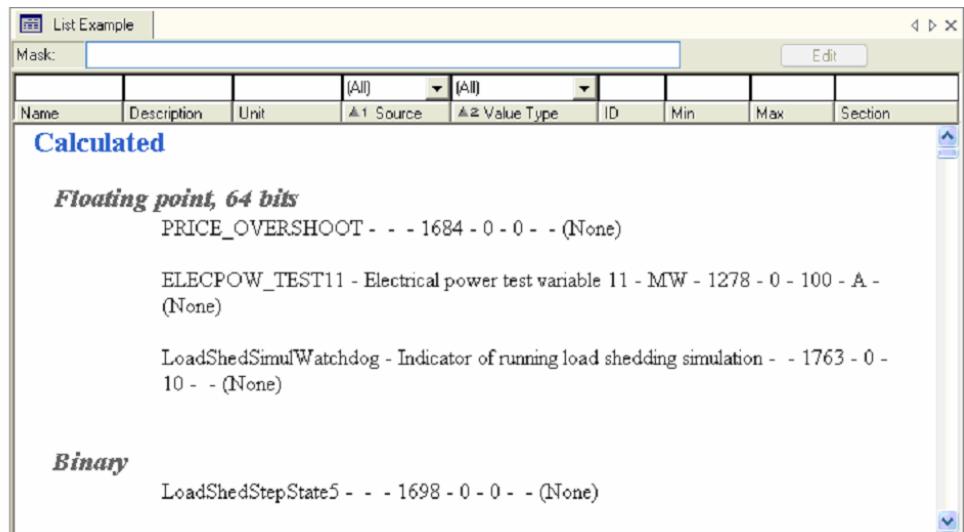


Figure 13: Properties dialog for lists

- In the **Properties** dialog for lists (Figure 13), at least the source of the properties listed below must be specified.
  - Location**: Definition of the source location.
  - Source**: Source (table) of the displayed information, for example Variable log.
  - Type**: The following types are available for displaying the information:
    - List: Select basic attributes of the source to be shown.

List Example*						
Mask: [ ] Edit						
Name	Description	Current Value	Unit	(All)	(All)	
PRICE_OVERSHOOT		-214		Calculated	Floating point, 64 bits	<input type="button" value="▼"/>
ELECPOW_TEST11	Electrical pow...	8.06 MW		Calculated	Floating point, 64 bits	<input type="button" value="▼"/>
LoadShedSimulWatchdog	Indicator of ru...	0		Calculated	Floating point, 64 bits	<input type="button" value="▼"/>
LoadShedStepState5		No		Calculated	Binary	<input type="button" value="▼"/>

- Text: Select the basic attributes of the source to be shown. The attributes are shown as packed text instead of a table. The pieces of information in the column according to which the rows on the list have been ordered are shown as headers. Identical headers are not repeated. The rest of the information is written sequentially in the column order, separated by hyphens. Current values and other virtual attributes are not shown.



- **Counted List:** In addition of the basic attributes of the source, select the minimum, maximum, sum, and average of each basic attribute, as well as the count to be shown.

Events Top Ten			
Count	Event Priority	Section	Name
2877	Notice	PGW	HM0655_PIN4
2842	Notice	TMP2	GS-810B_PIN2
1678	Notice	TMP2	JD_SEIS
1660	Notice	TMP2	JC_SEIS

Event Time:  24  29/03/2004 17:00

- **Fixed columns:** Specifies the number of columns (starting from the left) that are always visible. Columns cannot be scrolled out of view with the scroll bar.
- **Truncate at:** If the source has an unlimited number of items, specify here how many items are fetched. The items are selected in the defined sort order. Note that if a large number is specified, it may slow down the system.
- **Search:** Shows the Mask bar where the user can enter a string mask that is compared with the text strings in all columns. See the Historian Operation manual for more information on how to use the Mask bar.
- **Advanced search:** Shows the column-specific selection boxes below the Mask bar. See the Historian Operation manual for more information on how to use the Selection bar.
- **Column resizing by dragging:** Allows changing the column widths by dragging the column header.
- **Row sorting by clicking:** Allows sorting the list rows in the normal/reverse order by clicking the column header. See the Historian Operation manual for more information on sorting.
- **Row numbers:** Adds a number in front of the row.
- Specify which attributes are shown in the columns of the list in the table at the bottom.
  - **Visible:** Shows whether the attribute (column) is shown on the list.
  - **Name:** Name of the attribute, shown in the column header on the list.
  - **Format:** Defines the format of the row. For example, g = time with accuracy of one second.
  - **Color:** Color used to show the attribute on the list.
  - **Font:** Font used to show the attribute on the list.
  - **Mask:** Defines the used filtering for the column.

- **Hidden Mask**: Defines the used filtering for the row that is not visible.
- **Mask Visibility**: Defines the presentation of the columns.
- **Graph Type**: Defines the graphical outlook of the numerical column (Trend etc.)
- **Graph Color**: Defines the color of the numerical column.
- **Include on out of Range Left**: When defining the time range, this options also displays the row that indicates the results from an earlier time range.
- **Include on out of Range Right**: When defining the time range, this options also displays the row that indicates the results from a later time range.
- Select the attributes to be shown or not shown (check box selected or cleared) by clicking the following buttons. For each source, certain attributes are shown by default.
  - **Select/Deselect**: Selects/deselects the highlighted item (i.e. row that has been selected by clicking). Only one of the buttons is visible at a time.
  - **Select All**: Selects all items.
  - **Deselect All**: Deselects all items.
  - **Invert All**: Deselects all selected items and selects all unselected items.
  - **Reset**: Returns the selections to what they were when the dialog box was opened.
- Order the attributes in the list columns by selecting the attribute row and clicking the following buttons.
  - **Move Up**: Moves the highlighted attribute upwards in this dialog box, i.e. left on the list.
  - **Move Down**: Moves the highlighted attribute downwards in this dialog box, i.e. right on the list.
- Save the settings when closing the list window.

## 5.2 Open list window

To specify the list properties:

- Open the list window.
- To define lists that show only rows that match certain criteria:
  - Specify the criteria on the selection bar, see the SYS600 Historian Operation manual. For example, create a variable list showing all binary variables of section PK11, as in the figure below.
  - Hide the selection bar by right-clicking the column header and then clicking **Advanced Search** on the pop-up menu to remove the check mark beside the command, or by deselecting **Advanced Search** in the **Properties** dialog for lists.
  - Rename the list window suitably.



The contents of the Search bar cannot be saved.



String masks cannot be used for large, non-cacheable lists in the list selection boxes on the selection bar.

Binary Variables of Section PK11*								
Name	Description	Current Value	Unit	Source	Type	Process	Section	
LOAD_A1_011	Load A1 test_011	Open - clo...	C	Generic proc...	Binary	(None)	PK11	
LOAD_A1_012	Load A1 test_012	Open	C	Generic proc...	Binary	(None)	PK11	
LOAD_A1_013	Load A1 test_013	Closed	C	Generic proc...	Binary	(None)	PK11	
LOAD_A1_014	Load A1 test_014	Open	C	Generic proc...	Binary	(None)	PK11	
LOAD_A1_015	Load A1 test_015	Open	C	Generic proc...	Binary	(None)	PK11	
LOAD_A1_016	Load A1 test_016	Closed	C	Generic proc...	Binary	(None)	PK11	

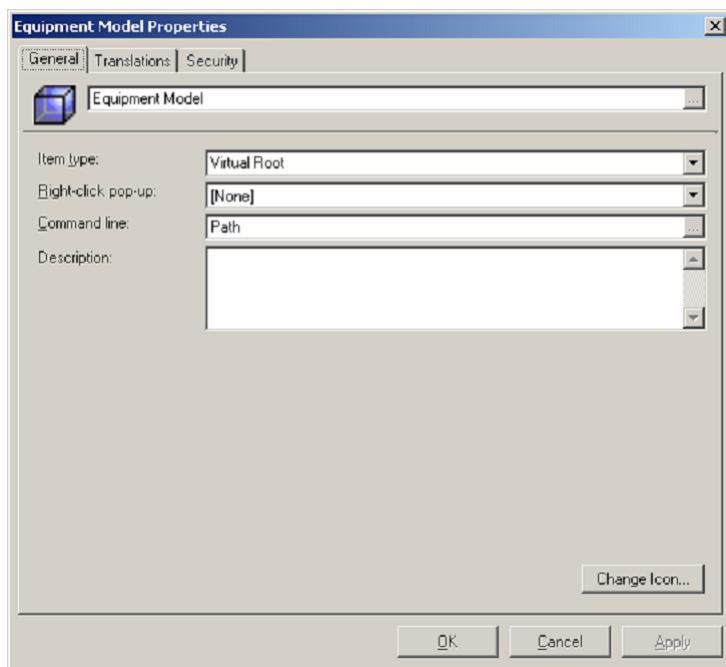
- To specify the order of rows:
  - Specify the columns according to which the rows are sorted and in which order (ascending or descending) by clicking the column header, or by right-clicking the column header and selecting the appropriate sort command. See the Historian Operation manual for more information.
  - Lock the sorting by right-clicking the column header and then selecting **Sorting Locked** from the pop-up menu so that the check mark becomes visible beside the command, or by deselecting **Row sorting by clicking** in the **Properties** dialog for lists.
- To change the column widths:
  - Drag the column headers as necessary or right-click the column header and click **Column Widths by Contents**, which adjusts the column widths so that the contents and column header texts of all columns are visible.
  - Lock the list appearance by right-clicking the column header and then selecting **Appearance Locked** from the pop-up menu so that the check mark becomes visible beside the command, or by deselecting **Column resizing by dragging** in the **Properties** dialog for lists.
- Save the settings when closing the list window.



## Section 6      Configuring Equipment Model

Equipment Model can be used to group and organize variables into a structure. Grouped variables can then be easily displayed on a list or as a trend. The Equipment Model is typically found from the top level of the Tree. It is built automatically when the signals are configured in SYS600. By default, the Object Identification (OI) structure from SYS600 application object structure is used as the Equipment Model.

Additional entries can be created for custom items in SYS600 Historian. Right-click the desired tree level where an Equipment Model should be created and select **New Folder** from the pop-up menu. Right-click the new folder and select **Properties** to access the **Properties** dialog.

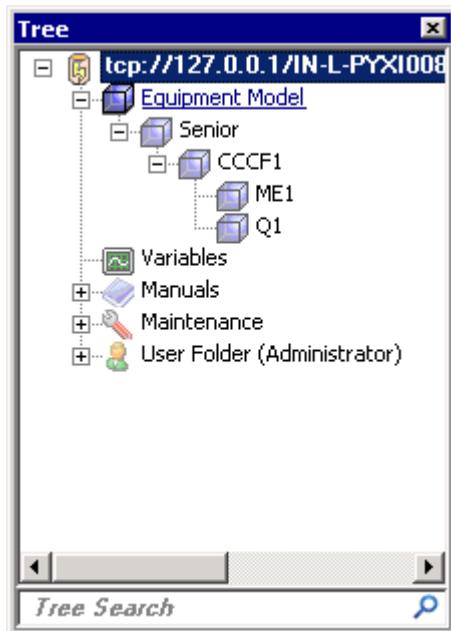


*Figure 14: Correct settings for the Equipment Model folder.*

In the **Properties** dialog, select Virtual Root as the Item type. Type Path into the Command line edit box. Type Plant Model into the topmost edit box to set the name of the Equipment Model folder. The name and position of the Equipment Model can later be changed as for any other tree item.



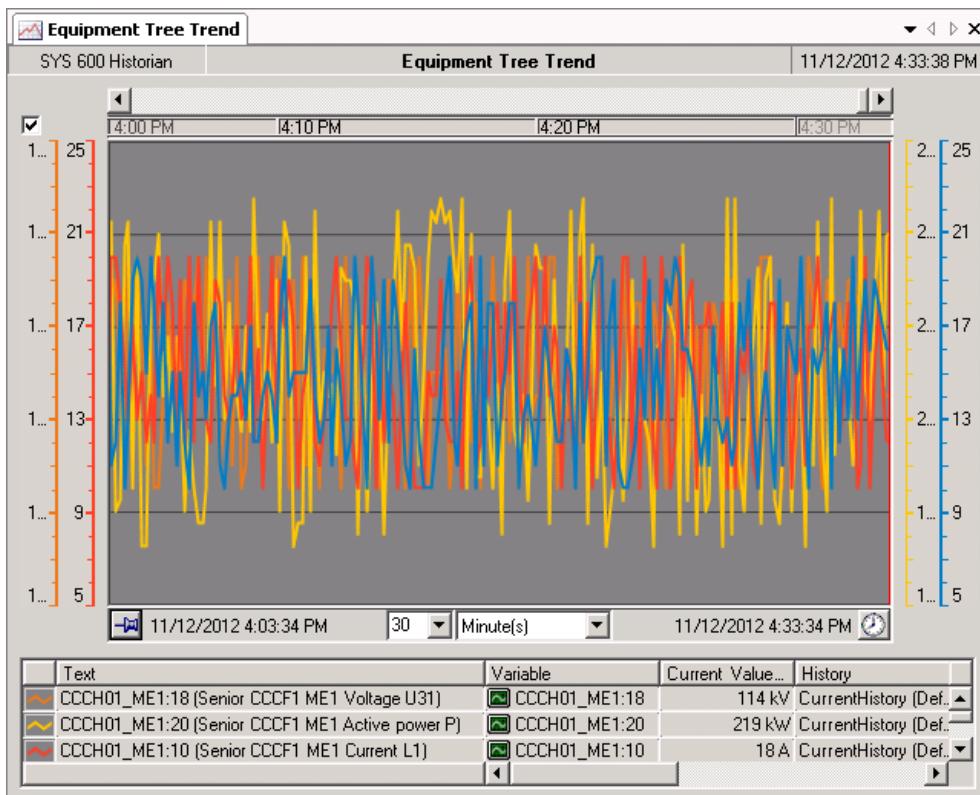
There can only be one Equipment Model hierarchy in use. If several Virtual Roots i.e. Equipment Models are created, they will show identical content.



*Figure 15: Equipment Model with example content in the Tree Window.*

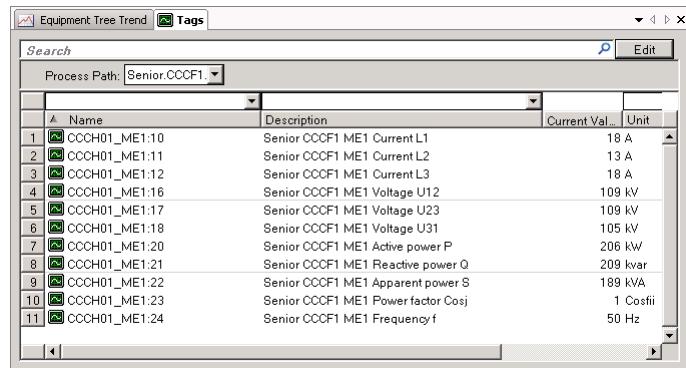
Once an Equipment Model is established, any defined group of variables can be sent to any of the displays attached to the Equipment Model. To display a group of variables, right-click the desired group and select **Send To** from the pop-up menu. This opens up a list of available displays.

Selecting a display from the pop-up list opens the display with all the variables in the group. A trend display shows all the variables on the same chart, as an example.



*Figure 16: A variable group displayed as a trend.*

The variables can also be viewed as a list showing all the variables in the group.



A screenshot of the 'Equipment Tree Trend' window. At the top, there are tabs for 'Equipment Tree Trend' and 'Tags'. Below the tabs is a search bar with the placeholder 'Search' and a dropdown menu set to 'Process Path: Senior.CCCF1'. There is also an 'Edit' button. The main area is a table with columns: 'Name', 'Description', 'Current Val.', and 'Unit'. The table contains 11 rows of data, each starting with a small icon and followed by a variable name and its description. For example, row 1 is 'CCCH01\_ME1:10' with the description 'Senior CCCF1 ME1 Current L1'.

Name	Description	Current Val.	Unit
1 CCCH01_ME1:10	Senior CCCF1 ME1 Current L1	18 A	
2 CCCH01_ME1:11	Senior CCCF1 ME1 Current L2	13 A	
3 CCCH01_ME1:12	Senior CCCF1 ME1 Current L3	18 A	
4 CCCH01_ME1:16	Senior CCCF1 ME1 Voltage U12	109 kV	
5 CCCH01_ME1:17	Senior CCCF1 ME1 Voltage U23	109 kV	
6 CCCH01_ME1:18	Senior CCCF1 ME1 Voltage U31	105 kV	
7 CCCH01_ME1:20	Senior CCCF1 ME1 Active power P	206 kW	
8 CCCH01_ME1:21	Senior CCCF1 ME1 Reactive power Q	209 kvar	
9 CCCH01_ME1:22	Senior CCCF1 ME1 Apparent power S	189 kVA	
10 CCCH01_ME1:23	Senior CCCF1 ME1 Power factor Cosj	1 Cosf1	
11 CCCH01_ME1:24	Senior CCCF1 ME1 Frequency f	50 Hz	

Figure 17: A variable group displayed as a list.

A list display for a variable group also shows the process path above the variable list.

## 6.1 Assigning new displays to Equipment Model

The list of displays available in the Send To pop-up menu of the Equipment Model can be expanded by associating new displays with the Equipment Model. This is done by using the **References Configuration** display.

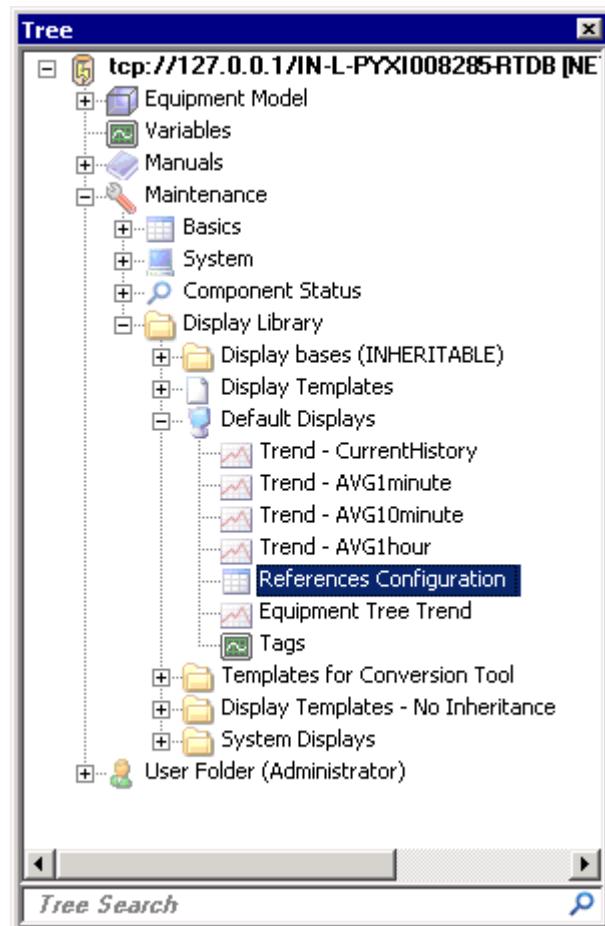


Figure 18: Locating References Configuration in the TreeWindow.

To add a new display to be accessible from any node of the Equipment Model structure, first go to the **References Configuration** display. Locate the desired display and its ID from the topmost list view. Copy the ID of the desired display to the clipboard by right-clicking the corresponding rows on the ID field and select **Copy Selected Data**. Now access the reference list on the bottom of the display to add a new reference to the list as instructed in [Section 8.1](#).

Search							New	Revert	Delete	Commit
Text	Sort Key	Source Type	Source ID	Additional Mask	Target Type	Target ID				
8 Trend of all tags	8 Path	(None)	(None)	(None)	TreeNode	8088c404-94				
9 Variables	9 Path	(None)	(None)	(None)	TreeNode	a4c2ca3a-ce				
10 Equipment Model Trend- AVG1MIN	10 Path	(None)	(None)	(None)	TreeNode	d3db2a9f-3				

Figure 19: Adding a new display type to Equipment Model using window references.

Paste the copied ID of the desired display to the **Target ID** field of the newly created row.



Clean any leading or trailing characters outside the actual ID after pasting. The actual ID is of the form: *0881b3c7-11d3-4f42-85b7-9b56932ac815* whereas the ID copied and pasted from the display list may be of the form: *{0881b3c7-11d3-4f42-85b7-9b56932ac815};(None)*.

Use Path as the Source Type and assign a descriptive name for the new reference. The default value TreeNode is to be used as the Target Type. Finally, assign an appropriate sort key for the new reference to place it in desired position in the pop-up menu. After checking the changes, press the **Commit** button to take the new display into use in the Equipment Model.

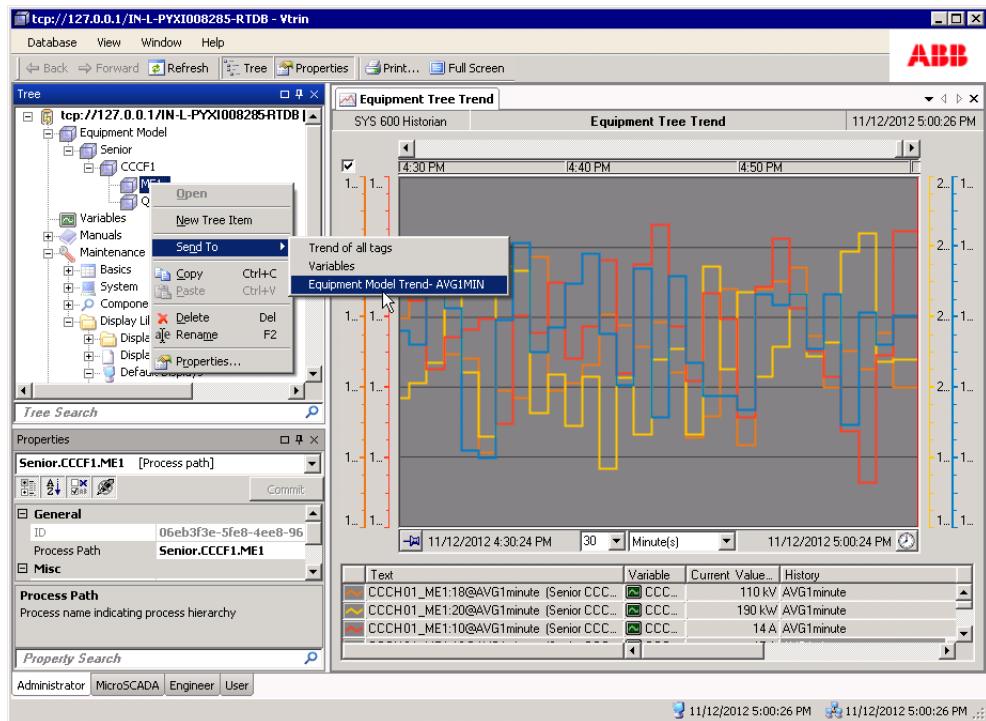


Figure 20: The newly added display is accessible through the Equipment Model nodes.

## 6.2 Adding a new group to Equipment Model hierarchy

In the Equipment Model, the variables are grouped using the Process Path associated to them. This attribute is configured automatically by SYS600. If settings are changed, the settings are

updated when SYS600 is connected to the SYS600 Historian. However, if a variable is created manually, the Process Path must be configured as described here.

New variable groups are created to the Equipment Model either by adding new nodes to the Equipment Model in the Tree Window (recommended) or by using the Process Path configuration display.

To add a new variable group through the Tree Window, open the Equipment Model hierarchy up to the point where the new group should be created. Right-click the parent node of the new node to be created and select **New Tree Item**. This will create a new node under the targeted tree node.

Enter a descriptive name to the node and proceed to assign appropriate variables to the new group as instructed in [Section 6.3](#).

To add a new group using the Process Path display, first locate the Process Path tree item inside the Tree Window. Use the Tree Search, for example, to quickly locate the item.

Open up the Process Path display to see the existing Equipment Model groups. To create a new group, click **Edit** in the upper right corner of the list display.

Process Path	DisplayName	Parent	Equipment
1 Senior.CCCF1.ME1	ME1	Senior.CCCF1	(None)
2 Senior	Senior	(None)	(None)
3 Senior.CCCF1.Q1	Q1	Senior.CCCF1	(None)
4 Senior.CCCF1	CCCF1	Senior	(None)

*Figure 21: Editing the Equipment Model variable groups in the Process Path tree item. Clicking the **New** button adds a new row to the list.*

Process Path	DisplayName	Parent	Equipment
1 Senior.CCCF1.ME1	ME1	Senior.CCCF1	(None)
2 Senior	Senior	(None)	(None)
3 Senior.CCCF1.Q1	Q1	Senior.CCCF1	(None)
4 Senior.CCCF1	CCCF1	Senior	(None)
5 (Fill)	...	(None)	(None)

*Figure 22: Adding a new group to Equipment Model.*

Enter the process path of the new group into the **Process Path** field and type in the desired display name into the **Display Name** field. Select the possible parent group from the drop-down menu of the **Parent** field. If no parent group is defined, the new group will be added to the root level under the Equipment Model folder. This way, a hierarchy of variable groups can be created and maintained.

Process Paths				
	Process Path	DisplayName	Parent	Equipment
1	Senior.CCCF1.ME1	ME1	Senior.CCCF1	(None)
2	Senior	Senior	(None)	(None)
3	Senior.CCCF1.Q1	Q1	Senior.CCCF1	(None)
4	Senior.CCCF1	CCCF1	Senior	(None)
5	Historian	Historian	(None)	(None)
6	Historian.CPU	CPU	... Historian	(None)

Figure 23: Filling in the information for the new variable group.

After committing the changes with the **Commit** button, the new group will be visible under the Equipment Model structure.

## 6.3 Assigning variables to Equipment Model groups

The variables intended for the new group can be added one by one from the **Variables** list. Select the desired variable from the list and select **Properties** from the pop-up menu. Select a Process Path from the drop-down menu to the variable. The Process Path selection assigns the variable to the variable group associated with the Process Path.

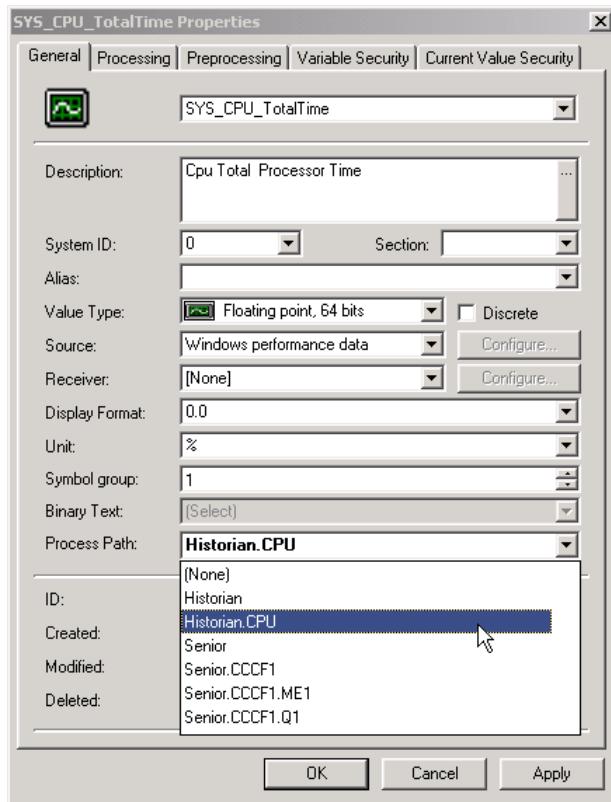


Figure 24: Selecting a Process Path to a variable assign the variable to the desired variable group.

After all variables have been added to the group, all the variables can be displayed by selecting **Send To** from the pop-up menu of the group. If there are displays configured for the Equipment Model, they can be used to verify the contents of the newly created group.

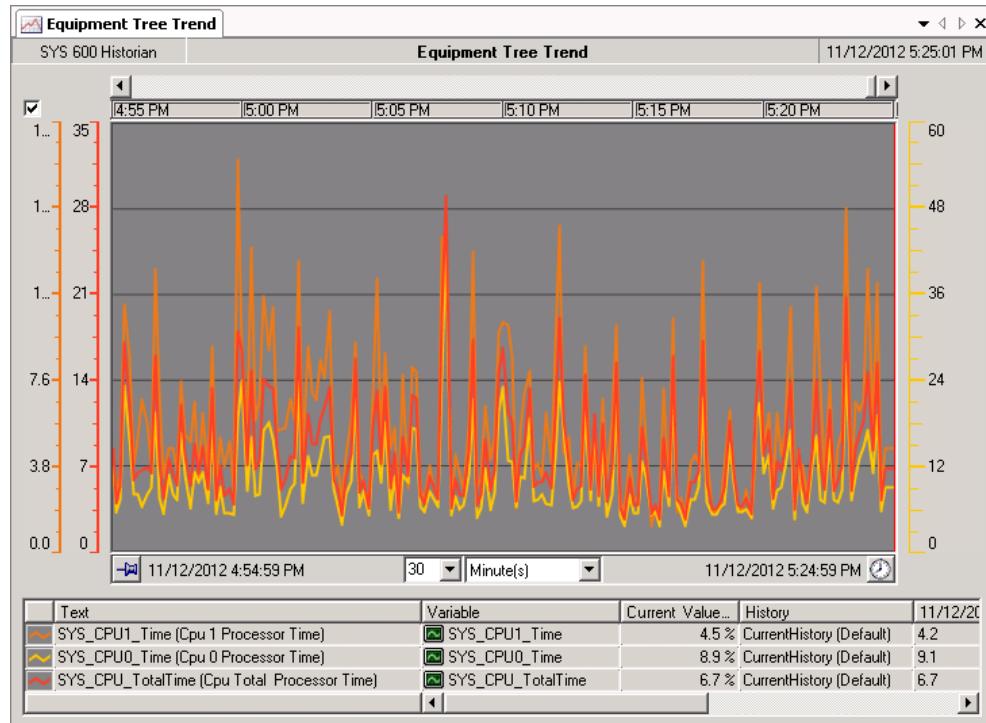


Figure 25: Variables of one variable group displayed as a trend.

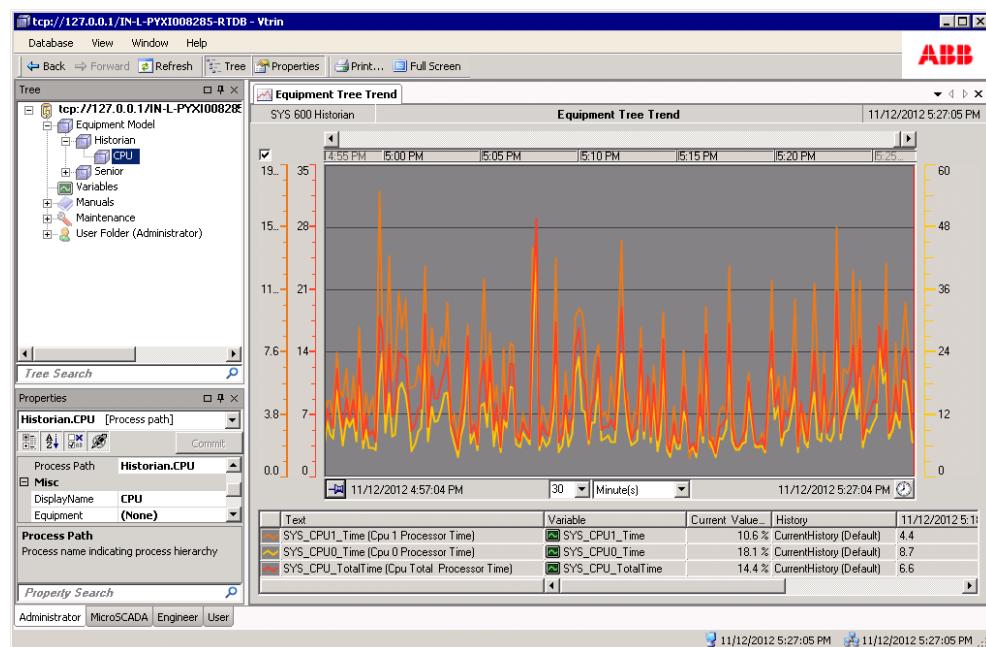


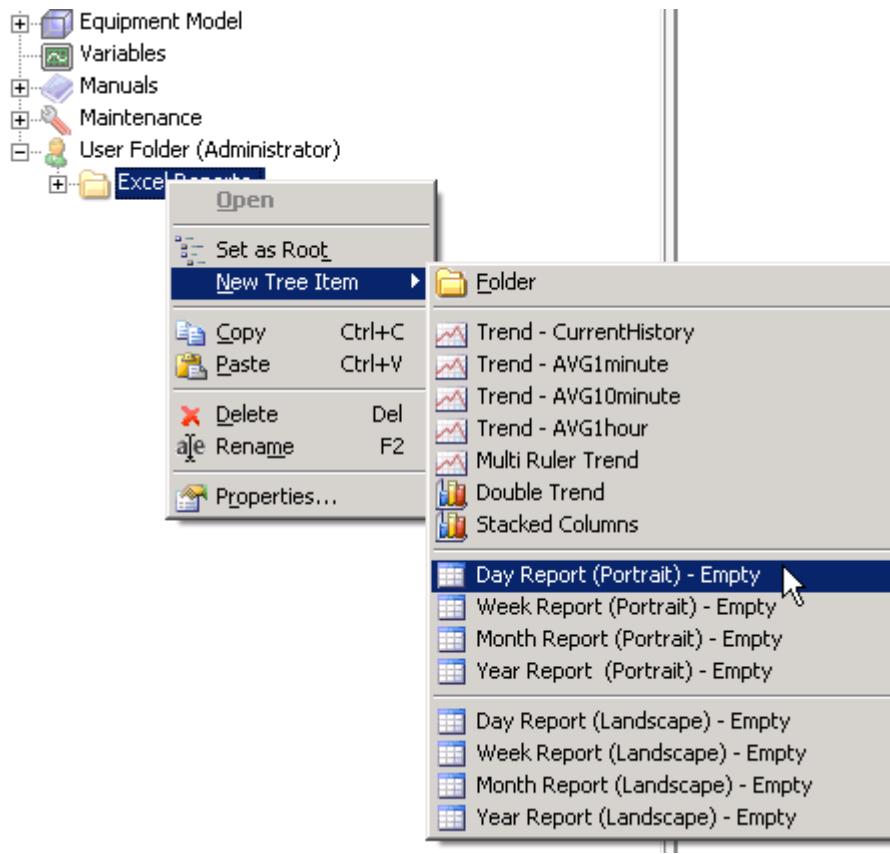
Figure 26: A trend presentation of a collection of system variables grouped using the Equipment Model functionality.



# Section 7      Configuring template report

## 7.1      Creating a report using a template

Right-click the tree folder in which a new report should be created. Select **New Tree Item** and the required template from the pop-up menu.



*Figure 27: Accessing report template from tree context menu*

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. If any changes are done to configuration, an asterisk (\*) is visible in Vtrin display tab at the top. Configuration is saved to the same Vtrin tree item as opened by using CTRL+S.

## 7.2 Report configuration

### 7.2.1 Accessing report configuration dialog

Open the Report configuration form by right-clicking a report toolbar and selecting **Configure** from the pop-up menu.

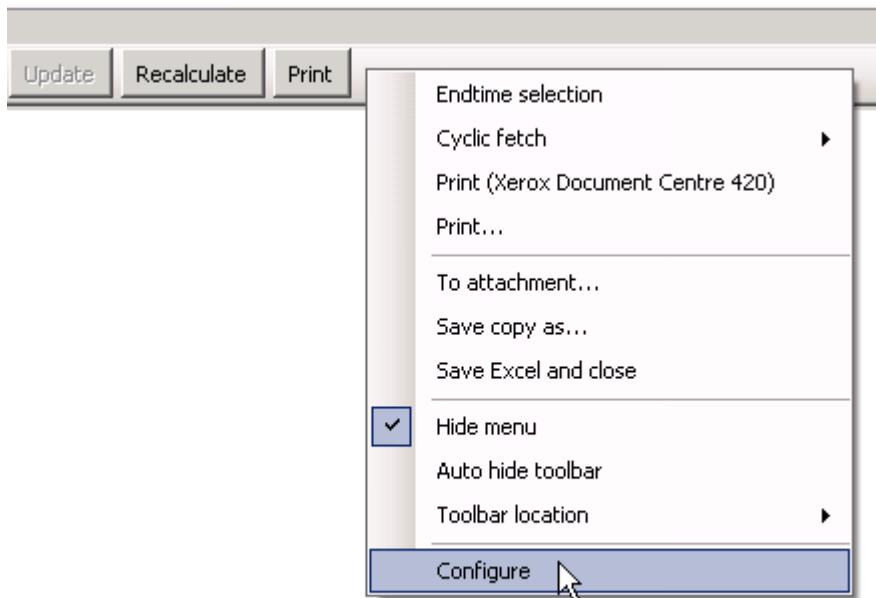


Figure 28: Accessing Configuration dialog from report toolbar

Close the configuration by pressing the **Close** button at the bottom right. The **Close** button closes configuration but enable the user to continue using the report with current configuration (some configuration is applied only when report is opened again). Close the entire report by pressing the X on the top right corner of the dialog.

### 7.2.2 General tab

Report template has general settings. General settings are applied in all configured levels in report.

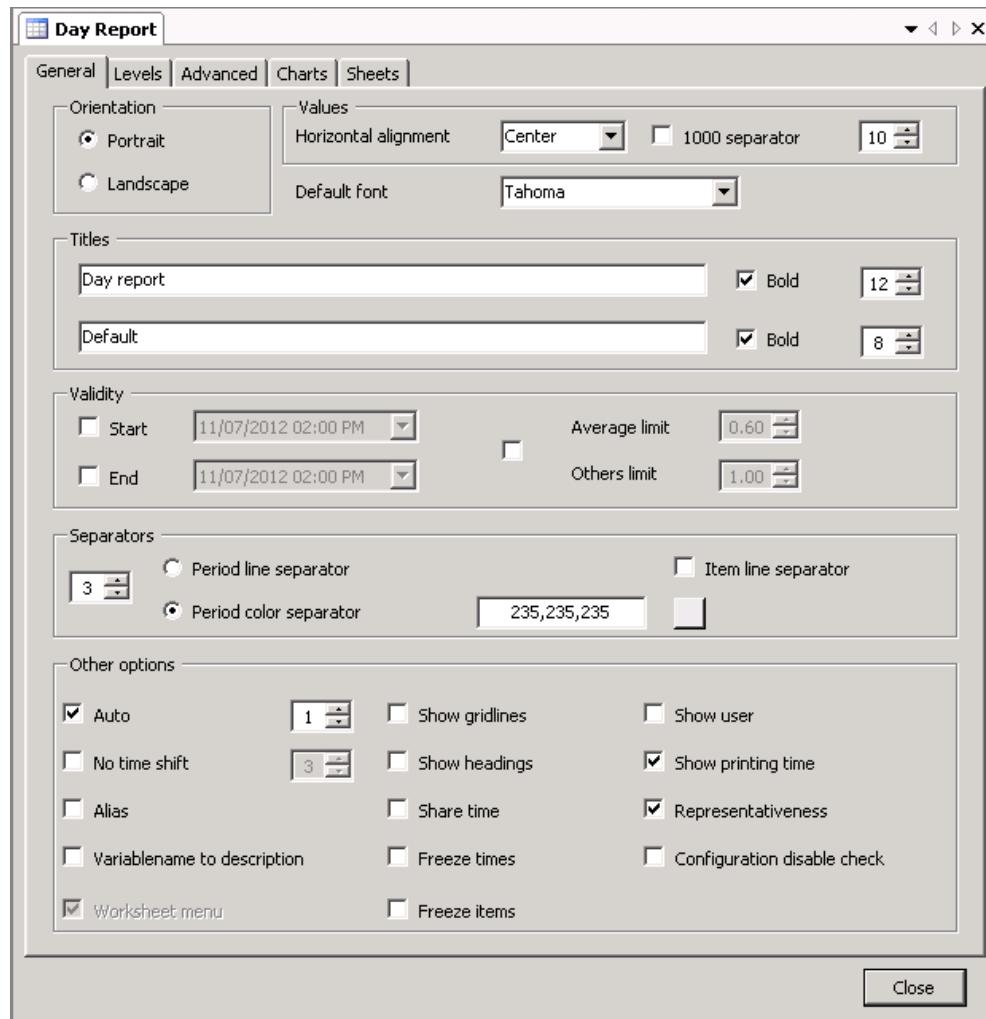


Figure 29: Configure dialog – General tab

Table 1: Description of General tab items

Tab items	Description
<b>Orientation</b>	Report orientation. In a portrait report, each separate item is printed onto one column and period values onto rows, and vice versa in a landscape report.
<b>Values</b>	Values settings enables the user to define how fetched values are aligned, the usage of thousand separator and font size. Alignment can be either center, right or left.
<b>Default font</b>	Default font used in a Report worksheet. These settings are applied only when a report is opened.
<b>Titles</b>	General configuration has two optional titles, while each level also has a title level definition. Boldface and font size can also be set. Titles are printed on top of the fetched values.
Table continues on next page	

Tab items	Description
<b>Validity</b>	<p>There are two different kind of general validity configurations. Time validity settings mean that fetched values can be limited to certain time of period. If the time selection is out of validity time, no values are printed. The other validity setting affects the fetched value's validation. If the validity of value (representativeness) is less than the configured limit value in the report, the value is marked as invalid (magenta and number sign (#)).</p> <p>Even raw data in the database already has validity information, report has its own limits, because results are always manipulated (by filters) somehow from raw data. If the check box left of Average and others limit is unselected, the validity limit is taken from fetched history table. Otherwise, the limits can be given manually (0-1, 1 means full representativeness). The average limit is used for table types average, current history, last, first, forecast and deviation.</p>
<b>Separator</b>	<p>Separator configuration enables to distinguish periods and items. Periods can be separated by lines or by background color. The value on the left of the period radio buttons means the number of periods when the separator is added.</p> <p>Color is defined by RGB values separated by comma. The color editor is launched by pressing the button next to the RGB textbox. The button face is also used to preview the selected color.</p>
<b>Item line separator</b>	If the <b>Item line separator</b> check box is selected, lines are added between fetched values.
<b>Other options</b>	
<b>Auto</b>	If Automatic fetch is selected, the values are fetched after start time is changed after delay in seconds defined in text box. If both time selections (start and end) are visible, automatic fetch is not done.
<b>No time shift</b>	If <b>No time shift</b> is selected, all times represent UTC time (time parameters and period timestamps). Offset in hours can be given in text box.
<b>Alias</b>	If the <b>Alias</b> check box is selected, alias names are used instead of variable names when variables defined. Alias in one property of variable and is not defined as unique.
<b>Variablename to description</b>	If <b>Variablename to description</b> is selected, the default variable description is set to the variable name instead of the variable description when variables are defined.
<b>Worksheet menu</b>	Valid only when Excel 2010 is available and Excel report template plugin is configured into use instead of grid report template plugin. If the worksheet menu check box is selected, the Excel menu is visible. Also Hide menu setting in the report toolbar menu effects this when the report is open. ( <a href="#">Figure 28</a> )
<b>Show gridlines</b>	If <b>Show gridlines</b> is selected, gridlines are set to visible (cell borders).
<b>Show headings</b>	If <b>Show headings</b> is selected, row numbers and column letters are set to visible.
<b>Share times</b>	If <b>Share times</b> is selected and several levels are defined in the report, the previous defined time parameters are copied to input time parameters when the level is changed. Otherwise, the level time parameters are initialized by default calculations and hold their own previous selected times.
<b>Freeze times</b>	Freezing is a method to freeze certain areas to be visible all the time. If Freezing times is selected, the period timestamps are frozen.
<b>Freeze items</b>	Freezing is a method to freeze certain areas to be visible all the time. If Freezing items is selected, the item descriptions are frozen.
<b>Show user</b>	If <b>Show user</b> is selected, the user identifier (name or username) logged to Vtrin is added after period values.
<b>Show printing time</b>	If <b>Show printing time</b> is selected, the fetch time is added after period values.
<b>Representativeness</b>	If <b>Representativeness</b> is selected, the value's representativeness is added next to the value in brackets in case of representativeness is not [0%] or [100%].
<b>Configuration disable check</b>	If <b>Configuration disable check</b> is selected, the users without report configuration modification rights cannot open the configuration dialog.

### 7.2.3 Levels tab

Report template must have at least one added level. A level can be seen as one report. One configuration can have several levels added but the results of only one level are shown at a time.

Levels are configured from the **Levels** tab.

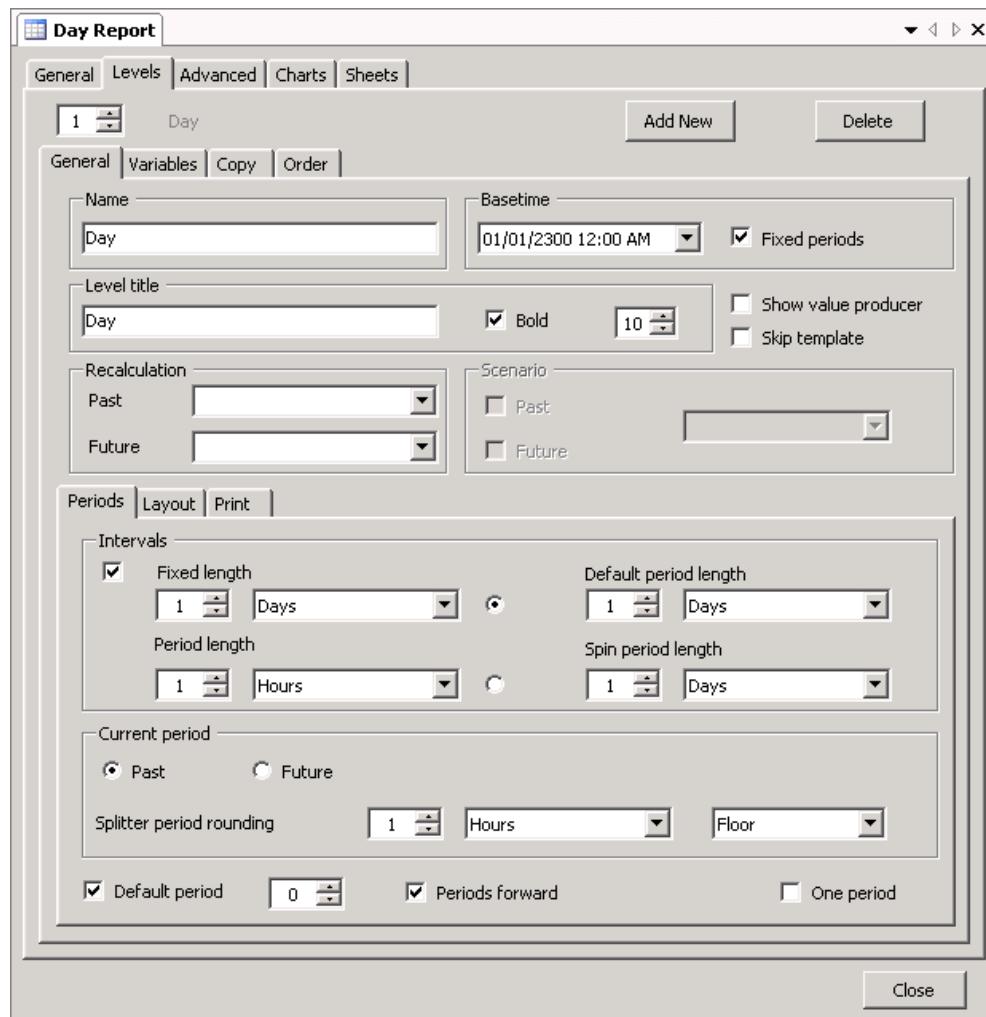


Figure 30: Configure dialog – Levels tab



Level is added or deleted only when the **Levels – General** tab is active.

*Table 2: Description of Levels tab items*

Tab items	Description
Level identifier	Level can be changed either by pressing the up or down buttons or by entering the identifier manually. The first level identifier is one and it is opened from Vtrin by default.
Add New	Adds a new level to configuration. The new level is added on the bottom of the list of levels. If one level already exists before adding a new one, the first level variables are automatically added to the new level. The new level has one variable by default (zero index), which is not fetched to report, but is used in configuration.
Delete	Deletes the current active level in configuration (visible in the level identifier).

### 7.2.3.1 Levels – General tab

Level configuration is handled tab **Levels/General**. Each level has also three sub tabs: **Periods**, **Layout** and **Print**.

*Table 3: Description of Levels-General tab items*

Tab items	Description
<b>Name</b>	The name of the level. Name is used as the identifier of a level in the drop-down lists in report toolbar if several levels are included.
<b>Level title</b>	The level title is printed on top of the values. Boldface and font size settings are also included.
<b>Basetime</b>	Basetime is used as the date from which a period in a report begins. If default time calculation is disabled, basetime is used as default time when a report is opened. Fixed period selected means that the Start fetch time is rounded against the basetime when the fixed report length selected. The time period length accuracy in rounding depends on the selection next to the report interval configurations.
<b>Recalculation</b>	Recalculation configurations are used as default parameters for recalculation activation, if it is launched from report toolbar. Past drop-down list includes recalculations defined for default RTDB-Scheduler (and for past scheduler if used in system). Future drop-down list includes recalculations defined for default RTDB-Scheduler (and for future scheduler if used in system).
<b>Scenario</b>	Not supported
<b>Show value producer</b>	If selected, information about value producer is added as comment to values (if known). Producer is also skipped if it is not changed. Select only temporarily, not applicable for normal use.
<b>Skip template</b>	If selected, Skip template leaves the template report sheet unprocessed. Do not use this unless there is at least one other sheet visible in the workbook.

## Levels – General-Periods tab

Table 4: Description of Levels-General-Periods tab items

Tab items	Description
<b>Intervals</b>	<p>Unselecting Fixed period means that even in a fixed report length case, the Start fetch time can be selected in report period length accuracy.</p> <p><b>Fixed length:</b> If Fixed length is selected, only the start fetch time is visible in report toolbar, and the end fetch time is calculated from the report length configuration below the Fixed length check box. Unselecting Fixed length makes the end fetch time selection visible in the report toolbar. Report length configuration is used then only when opened from Vtrin.</p> <p><b>Period length:</b> Period length in the report.</p> <p><b>Default period length:</b> Selecting Default period means that report default time calculation is done. Otherwise, the report basetime is used as the default time. In default time calculation, current time is first rounded down to the closest period start Default period length increments. Then, the time is jumped forward or backward in Default period time units depending on the integer configuration next to the Default period check box. Positive values mean that the time moves forward and negative values mean that it moves backward. Finally, other times are calculated by taking the report length units either forward or backward depending on the Periods forward configuration. Smaller of the two times is used as the selection for default fetch start time.</p> <p><b>Spin period length:</b> Spin period length defines how much previous time selections are changed forward or backward when using the Spin button in the report toolbar. Typically, spin period length is set to be the same as the report's fixed length configuration.</p>
<b>Current Period</b>	Current period configuration is used to define which (past or future) configuration is used for the current period. If past is selected, the fetch parameters are taken from past configuration, otherwise from future configuration. For longer period lengths, it can sometimes be useful to even split the current period into two parts. Current period splitting is defined with the splitter period configuration. For example, if report period length is one month and the data is available at the hour level, the current period is possible to be split into two parts. Split time is calculated by rounding the current time to floor or ceiling in period selection increments. One hour floor results in the current hour start. Splitter period rounding is the only rule used for rounding and must be selected separately for each item if it is also wanted to be used.
<b>Default period</b>	Default period selected means that the report default time calculation is done, otherwise the report basetime is used as default time. In default time calculation, the current time is first rounded down to the closest period start in Default period length increments. Then time is then jumped either forward or backward in Default period time units depending on the integer configuration next to the Default period check box. Positive values mean that the time is moved forward and negative times mean that it is moved backward. Finally, other times are calculated by taking the report length units either forward or backward depending on the Periods forward configuration. Smaller of the two times is used as the selection for default fetch start time.
<b>One period</b>	If One period is selected, only one period for any time selection is shown. Period length equals the fetch time interval.

## Levels – General-Layout tab

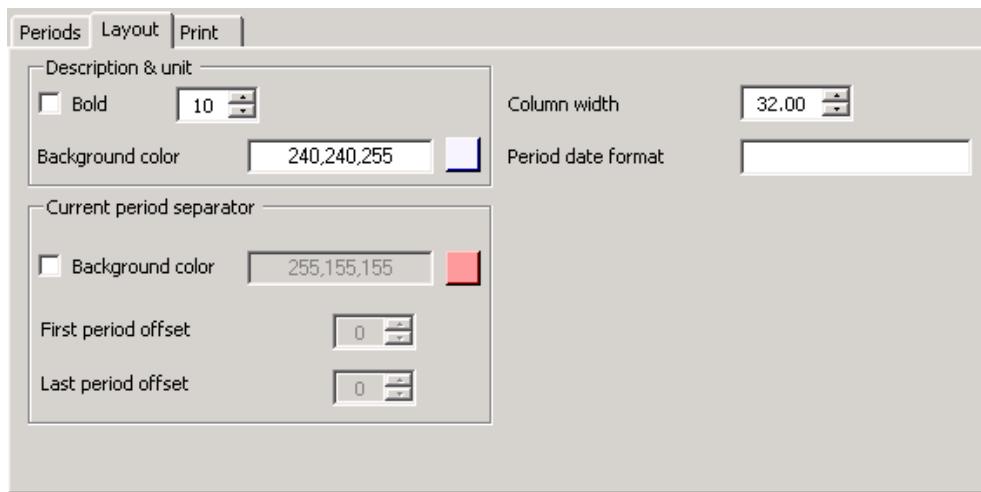


Figure 31: Configure dialog – Levels-General-Layout tab

Table 5: Description of Levels-General-Layout tab items

Tab items	Description
<b>Description &amp; unit</b>	Description and unit configuration enables the user to set bold and font size for the description area texts. Background color can also be set. The description area is shown below.
<b>Current period separator</b>	Certain periods can be highlighted in the report by selecting the <b>background color</b> check box in Current period separator configuration. Color is given in RGB values and defined from the button next to RGB textbox. The highlighted interval is defined by offsets (with the report period length as unit). Values less than zero lead to the past and values larger than zero lead to future. For example, in one hour period report values 0, and 0 leads to the current one hour period to be highlighted.
<b>Column width</b>	In portrait reports, column widths can be set in configuration.
<b>Period date format</b>	Period timestamp is split into date part and time part. Formatting the date part can be set from configuration if default formatting is not applicable. Insert date in the US English format using Y for year, M for month and D for day.

## Levels –General-Print tab

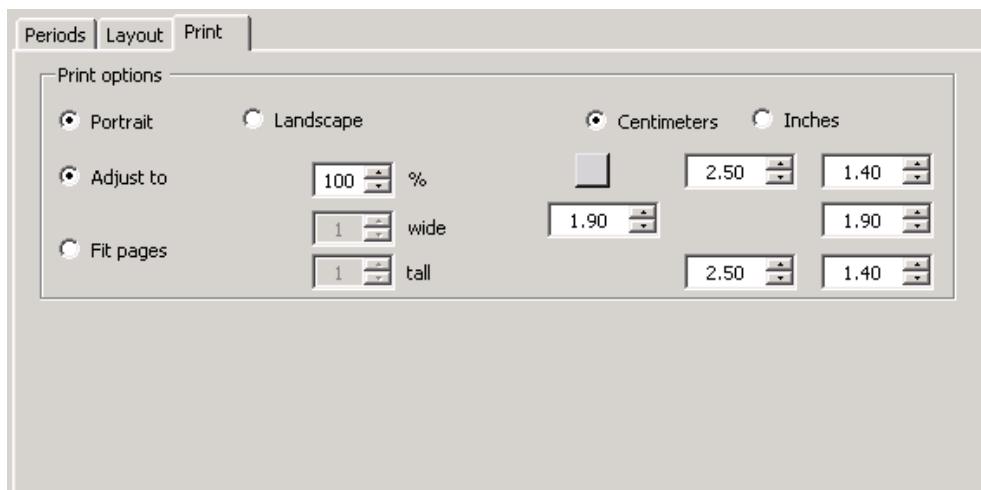


Figure 32: Configure dialog – Levels-General-Print tab

Table 6: Description of Levels-General-Print tab items

Tab items	Description
Printing orientation	Allows the user to print sheets sideways (Landscape view). This feature is very useful for spreadsheets that are too wide to be printed using the default portrait view.
Adjust to	Scaling: allows the user to adjust the size of the report worksheet.
Fit pages	Scaling: If the worksheet has a lot of columns, the Fit pages settings can be used to reduce the size of the worksheet to better fit the printable page.
Margins in printing	Starting from the left box value, the targets are (clockwise): left, top, header, footer and bottom margin. The button next to the margin copies the margin values from corresponding settings if desired.

### 7.2.3.2 Levels – Variables tab

A report template must have at least one level added to it. One level can be understood as one report. Variables are added separately to each level. In configuration, each level has a zero index item, which is not fetched to report, but is used in configuration. It is used as the default item for a new item added to the report, as well as a reference to certain settings.

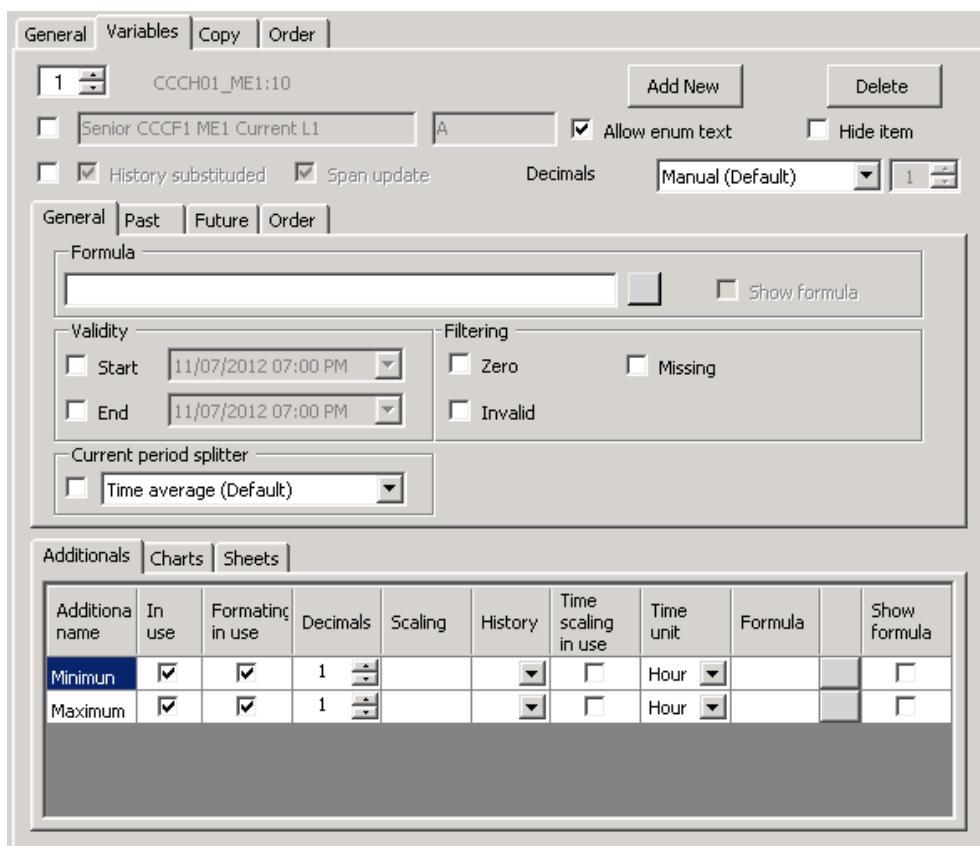


Figure 33: Configure dialog – Levels-Variables tab

Variable configuration for levels is found in the **Levels/Variables** tab. The **Variables** tab has several other tabs that include configuration for selected variables.

*Table 7: Description of Levels tab items*

Tab items	Description
Variable identifier	A variable can be changed by pressing the up or down buttons or by entering an identifier manually. The first variable identifier is zero, and it is not fetched to report, but is used in configuration.
<b>Add New</b>	Adds new variable to the level configuration (one level only). A new variable is added as the last item in the list of variables. The new variable has default values that are copied from the zero index variable on the same level.
<b>Delete</b>	Deletes the current active variable from variable configuration (visible in variable identifier) of the current active level in configuration.
Description and Unit	Item description used in the report. If the check box on the left is not selected, the description is fetched automatically from variable configuration in the database when the variable is changed. If the check box selected, description text box is changeable and is not automatically changed even if the variable is changed. Newline (\n) can be used in the description text. Item unit used in report. The check box next to the description locks or unlocks the unit the same way as described above.
<b>Allow enum text</b>	If Allow enum text is selected, text is printed instead of numerical value for binary variable enumeration.
<b>Hide Item</b>	If Hide item is selected, a variable is fetched but not printed on the final report. This is useful if calculated items are involved in the report and only the results should be printed.
Maintenance allowed	The first check box on the left must be selected to enable item values to be updated.
<b>History substituted</b>	If History substituted is selected, updated values are protected against overwriting by other applications.
<b>Span update</b>	If Span update is selected, each update is done in span mode, which guarantees that only manually updated periods are changed. Other option is Point mode, which updates the changed periods the same way but does not check if the following periods will be changed as well due to a missing value. Span update mode is often the best selection.
<b>Decimals</b>	Decimals configuration is used for item period value formation. This formation is also used in additional value formation if not overwritten. Each item has four options: <ul style="list-style-type: none"> <li>• General, where the value follow the general style, which means that decimals are shown as much as needed or possible</li> <li>• Past variable takes the number of decimals from past configuration variable definition from the database if a past variable is defined</li> <li>• Future variable takes the number of decimals from future configuration variable definition from the database if a future variable is defined</li> <li>• Manual option enables the text box on the right and the number of decimals can be entered manually</li> </ul> Other items except for the zero index also have a fifth option, which is always the first one in drop-down list. Selecting this first default options means that the formation for this item is taken from the zero index configuration.

## Levels – Variables-General tab

Table 8: Description of Levels-Variables-General tab items

Tab items	Description
<b>Formula</b>	<p>Report item can be calculated from other items in report. Formula for period from other item(s) from same period is defined by Excel RC reference style. Formula is better define with formula helper sheet activated from button next to formula textbox. Select calculated item from variable identifier before going to definition helper sheet. Before formula is defined add items to be referenced first.</p> <p>For example there could be two items: the first is fetched from database and the second is calculated from that.</p> <p>Press the button next to formula text box to go to Excel. All items defined in report are printed to first row with description and variable name. Calculated items has description calculated. Cell to where Excel formula is defined is colored yellow and selected automatically. Formula starts in Excel with =. If reference to other items needed click second row cell under description when defining formula. Remember to press ENTER when formula edition ended to leave cell editing mode.</p> <p>Return to configuration dialog from report toolbar button back to configuration.</p> <p>Defined formula is copied to formula textbox. If formula defined to item there is no fetch from database even some configuration available in variables and tables. Calculated value is only available in report.</p>
<b>Show formula</b>	If show formula selected report adds formula to be visible Report worksheet if possible (no hided items or filtering). Otherwise only value is copied Report worksheet.
<b>Validity</b>	Calculated item values are always valid. Item validity setting enables to set validity time limits to each item to be included to report. If check box selected time component is set to editable.
<b>Filtering</b>	<p>Filtering settings enable to skip item from report if certain condition is realized. If zero filtering selected condition to skip item printing is if all period values are equal to zero. If check box selected condition is if all period values are invalid. If <b>missing</b> check box is selected period values are not printed (repeat check box unselected).</p> <p>Filtering setting doesn't mean that only certain periods are left out from report if condition is true but if all period values fulfill condition the whole item is not printed.</p>
<b>Current period splitter</b>	Current period splitter is option if at <b>Levels – General – Period</b> tab defined current period splitting is applied to item. If not selected current period is handled as any other period in report. If check box selected, also value producing type must be defined from drop-down list. Also remember to use history table applicable to rounding rule

## Levels – Variables-Past tab

Item related configuration for past periods is found in the **Levels/Variables/Past** tab.

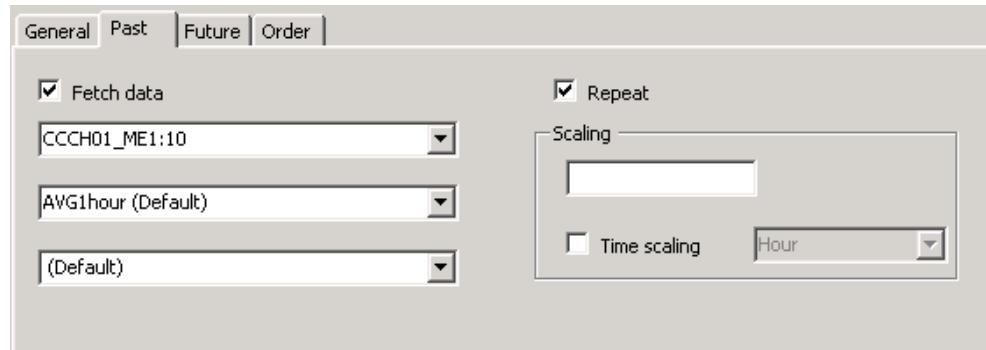


Figure 34: Configure dialog – Levels - Variables-Past tab

Table 9: Description of Levels - Variables-Past tab items

Tab items	Description
<b>Fetch data</b>	Fetch data must be selected if the item should be handled for past periods (fetched from database or calculated in the report).
<b>Repeat</b>	Repeat selection means that the value of the period is always shown. If not selected, the values are printed only for periods from where stored points are found. Do not leave this unselected if it is not known whether the value should be stored for each period or not. The Repeat setting is not applied to calculated (in report) items.
<b>Fetching parameters</b>	Fetching parameters are available if calculation is not defined for the item. The first drop-down list is for the variable. Variable names are case sensitive. If a variable is not found from the database, the text is colored blue. If a variable is created while the report is open, it is not available on the list. If the Alias check box in report configuration's General tab is selected, variable name is defined "alias@variablename". The second drop-down list is for history table. History tables are also case sensitive and if the selected table is not found from the database, the text is colored blue. For other items besides the zero index, an extra option is available on the list. The first option always refers to the selection made for the zero index item. The third drop-down list is a filter for Vtrin fetch. The filter is a rule for Vtrin to manipulate the original raw data. A report produces, by default, a filter based on the history table type. If this is not applicable, define the proper filter without period length. For example, if an average one hour table is used in one day period values, the default filter calculates the average, but if a raw sum is wanted, a filter must be given. The correct filter for Vtrin is SUMRAW1DAY, but because a report adds a period length automatically, the correct definition is SUMRAW. Exception to rule is if CALC filter used, in which case the period length must also be included. In filter configuration, it is also possible to reference to the zero index option.
<b>Scaling</b>	Scaling enables the user to multiply a fetch result before it is printed in the report. It is needed, for example, if a value is shown in the report in different unit than how it is stored in the database. Define the scaling factor in the text box. Simple calculations are supported if the scaling string starts with =, for example =1/3600 (executed in cell). If the <b>time scaling</b> check box is selected, the fetched value is multiplied by the number of time unit periods included in each fetched period. For example, if the average history table used for day value and time scaling in hours is defined, the day average value is multiplied by the number of hours in each day.

### Levels – Variables-Future tab

Item related configuration for future periods is found in the **Levels/Variables/Future** tab.

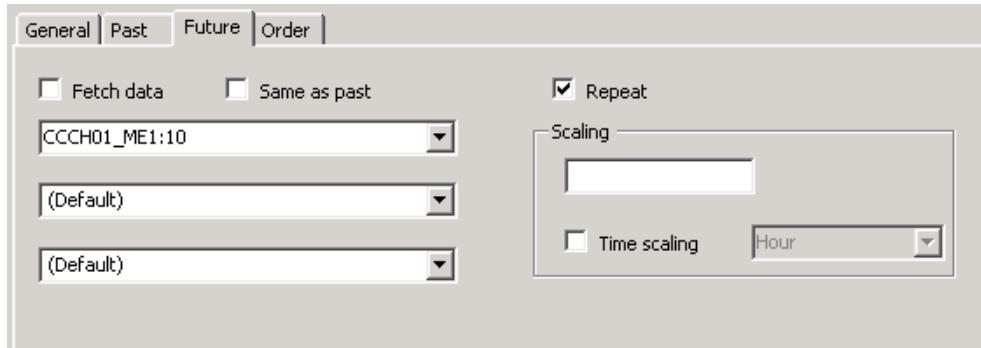


Figure 35: Configure dialog – Levels - Variables-Future tab

Table 10: Description of Levels - Variables-Future tab items

Tab items	Description
Same as past	If future period fetching is wanted to be same as past, check the <b>Same as past</b> check box. Past parameters are also copied to the <b>Future</b> tab.

Other configuration options in the **Future** tab are the same as in the **Past** tab.

The future functionality is not supported, and it is recommended to not change any settings on this tab.

### Levels – Variables-Order tab

There are several order tabs in report configuration for levels, variables, additional values and charts. The functionality is same for all. Items in the list are handled in the shown order, and if the order is needed to be changed, the list can be modified. Modify the list by first selecting an item (selection is shown with blue color) and then clicking either **Move Up** or **Move Down** as many times as needed.

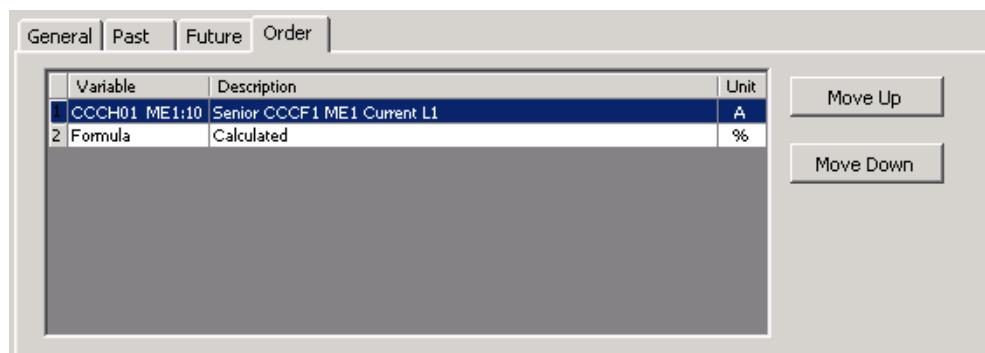


Figure 36: Configure dialog – Levels-Variables-order tab

### Levels – Variables-Additionals tab

If additionals are defined for a report, they are visible in a list in the **Additionals** tab.

These additional settings are done separately for each variable. The different columns are:

Table 11: Description of Levels-Variables-Additionals tab items

Tab items	Description
<b>Additional name</b>	Read only, taken from the additional configuration.
<b>In Use</b>	If selected, additional value for a variable is produced.
<b>Formating in use</b>	If not selected, the number format (number of decimals) is taken from item number format definitions used for period values. If selected, number of decimals is defined separately (see next).
<b>Decimals</b>	Number of decimals. Used only if the previous column value (Format in use) true.
<b>Scaling</b>	Scaling enables the user to multiply a result before it is printed in the report. Simple calculations are also supported if the scaling string starts with =, for example =1/3600 (executed in cell). Note! If the period value is already scaled, the additional value already includes scaling if it is calculated from period values.
<b>History</b>	Additional value can be read from the History table.
<b>Time scaling in use</b>	If selected, the result is multiplied by the number of time units in the fetched time span (see next).
Table continues on next page	

Tab items	Description
Time unit	Time unit used for time scaling.
Formula	Additional value can also be produced with Excel formula. Additional formula is supported to reference both any other additional value or all periods (own or other variables). Add the variables to be referenced before adding formula. The formula should be defined with the formula helper sheet that is activated by clicking the button next to the Formula text box. Procedure to define a formula is the same as when it is done to period values.
Show formula	If <b>Show formula</b> is selected, the formula will be visible in the Report worksheet if possible (no hidden items or filtering). Otherwise, only the value is copied to the Report worksheet.

### Levels – Variables-Charts tab

If charts are defined in a report, they are visible in a list in the **Charts** tab.

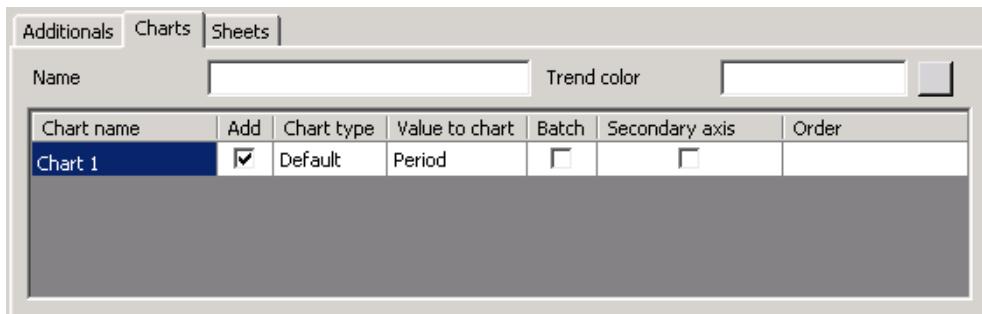


Figure 37: Configure dialog – Levels-Variables-Chart tab

These chart settings are done separately for each variable. The different columns are:

Table 12: Description of Levels-Variables-Charts tab items

Tab items	Description
Chart name	Read only, taken from the chart configuration.
Add	If selected, variable is added to chart.
Chart type	Chart type for a variable. The list is the same as for where chart default type is defined, except the first item on the list is called Default. Default type is taken from chart definition. Note! If "Scattered by only markers (XY trend)" is used, ensure that the items are ordered correctly. It is first used for X and second for Y (not possible to draw XY from only one variable).
Value to chart	Defines which results are added to the trend. The first item on the list is always Period and the rest are defined as additionals in the report. For example, a line trend is drawn from period values, but a pie trend from one value only (one of additionals).
Batch	If Batch selected, old trends for this item will not be deleted before adding new ones. That way the user can, for example, read two or more different intervals and compare them in a chart.
Secondary axis	If selected, the secondary axis is used for a variable.

Table continues on next page

Tab items	Description
<b>Order</b>	Enables the user to effect in which order the different items in chart are drawn. Rule for ordering is that all items without a given order get the number 10000000. Items with the same order number are drawn in the same order as the variable is defined in the report. If the order is not good, positive or negative numbers can be given to some or all of the items. The smallest order number is drawn first. Special order is given by adding a – (minus) sign after the number. Items that end with – are drawn last. If several items have a minus sign, they are compared against each other. With the minus sign, the user can move an item to the bottom of the list without adding order to all the other items as well.
<b>Name</b>	If a Name given, it is used in chart legend, if visible.
<b>Trend color</b>	Color of a trend item. If not defined, the color is automatic. Otherwise, the color is defined the same way as any other colors in the report by activating the color editor dialog by pressing the button next to the text box. The color is defined in RGB. A special setting is 0,0,0 which is handled as transparent (if supported by the chart type).

### Levels – Variables-Sheets tab

If sheets are defined in a report, they are visible in a list in the **Sheets** tab.

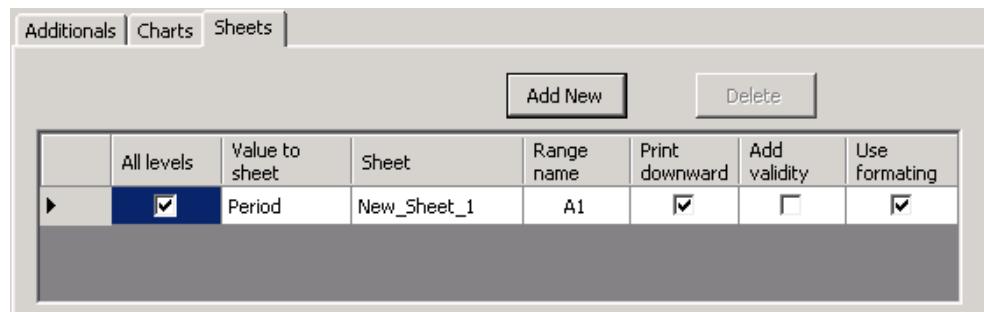


Figure 38: Configure dialog – Levels-Variables-Sheets tab

Table 13: Description of Levels-Variables-Charts tab items

Tab items	Description
<b>Add New</b>	Adds a new sheet printing related item to list. The same item's fetch results can be printed on several sheets with several ranges. The item order is not meaningful.
<b>Delete</b>	Deletes the selected item related to sheet printing from list. To enable the Delete button, the row header must be clicked.
<b>All levels</b>	If selected, the setting is valid at all levels for same variable index. If the first variable in level 1 has All levels selected, the first variables at all other levels will follow the same setting. Setting All levels to false is done only at the level where the definition done.
<b>Value to sheet</b>	Defines which results are printed. The first item on the list is always Period and rest are defined as additional in the report.
<b>Sheet</b>	Defines to which sheet the printing is done. Sheets defined in report will be available in list.
<b>Range name</b>	Defines the Range name (cell) to where an item is printed in the sheet. It is useful to manually provide good names for the cells, which can make bigger changes in layout afterward much easier to handle. Excel's default names, such as A3 or C5, can also be used. If the range name is inside brackets [], an offset to the actual range location is added (do not define the brackets to the actual range name). Offset is equal to the number of periods.

Table continues on next page

Tab items	Description
<b>Print downward</b>	Defines the direction to which the items are printed if there are more than one item to print.
<b>Add validity</b>	If selected, the same value status coloring as is used for template values is also added to printing.
<b>Use formatting</b>	If selected, some formatting is added by the template report if applicable. Formatting may include, for example, number format, horizontal and vertical alignment, font size and the Shrink to fit setting.

### 7.2.3.3 Levels – Copy tab

Copy level items to other levels.

Variables at each level in report are defined separately, which means that they can differ from each other if necessary. When a new level is added to configuration, the variables from the first level are added automatically to the new level. When a new variable added to a level, it is added only to the selected level. If variables in different levels are wanted to be same, the **Copy** functionality found in **Levels/Copy** is supported. Only the variables are copied, not all other level configurations.

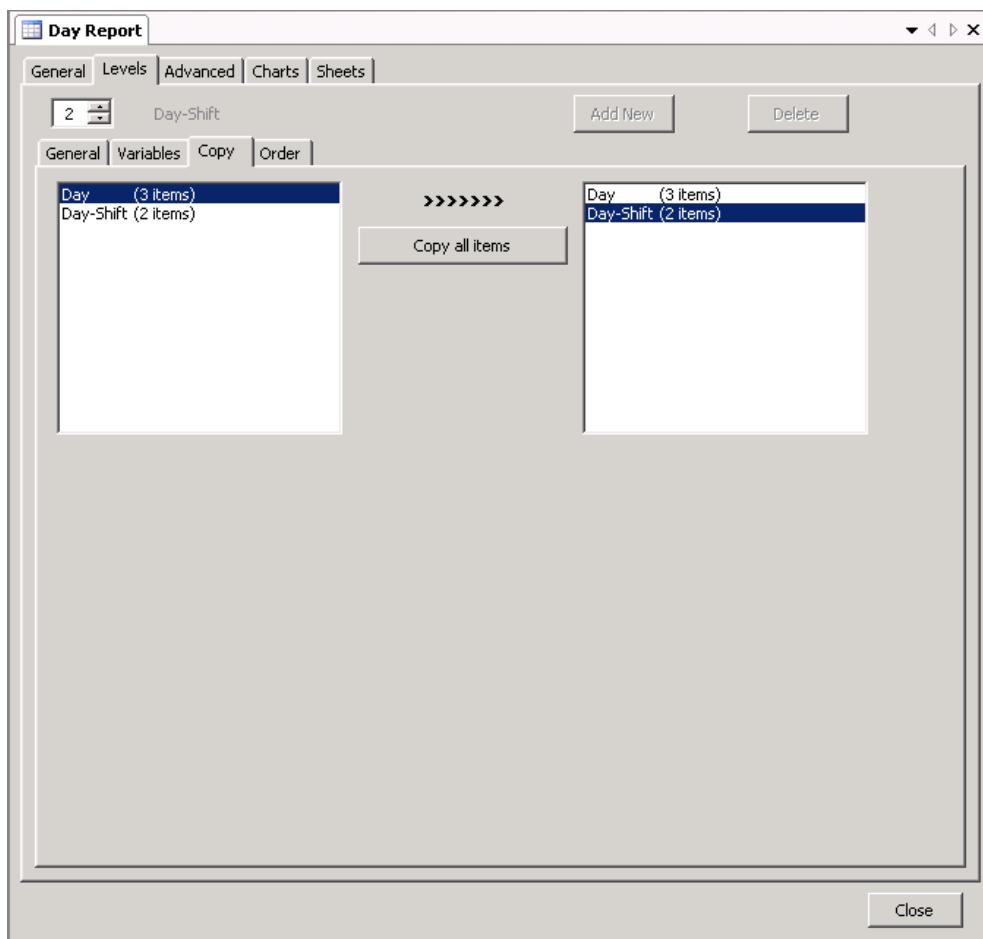


Figure 39: Configure dialog – Levels-Copy tab

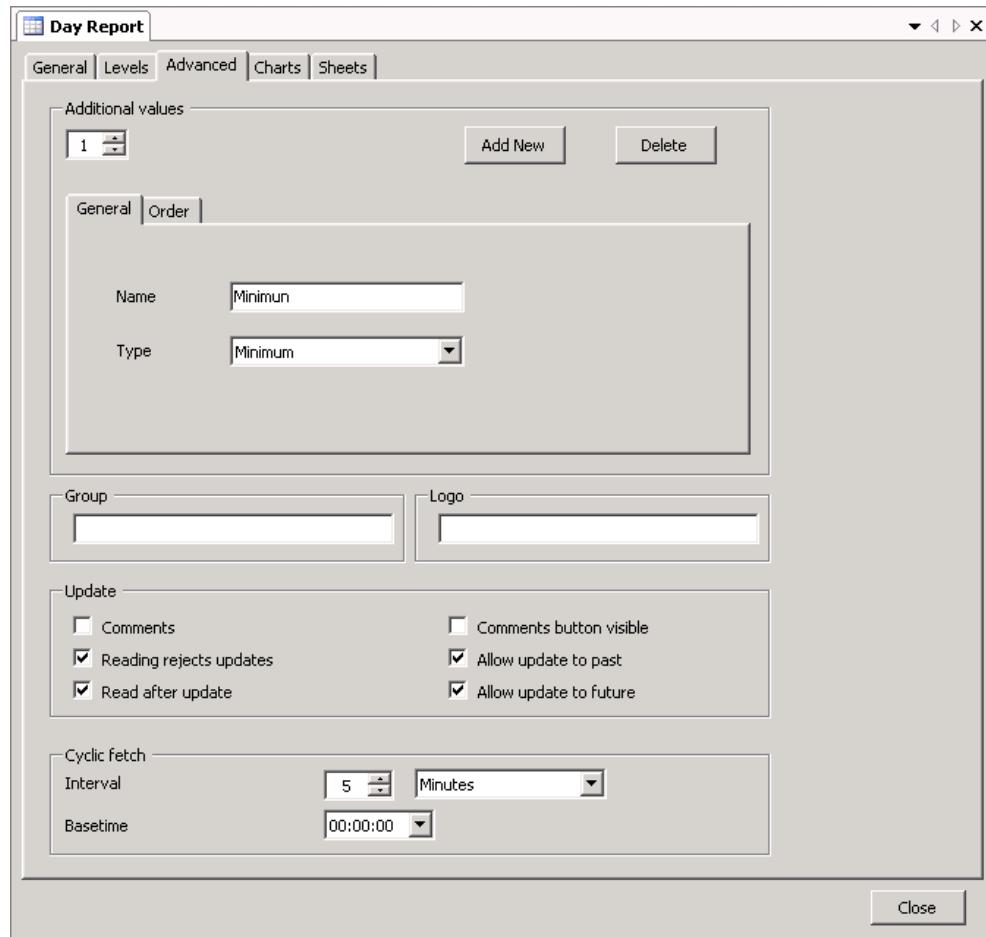
Select the level from which to copy from the box on the left and the target level(s) from the box on the right. After the selections are made, the **Copy all items** button is enabled. Press the **Copy all items** button to copy the selected items.

### 7.2.3.4 Levels – Order tab

Functionality is the same as in the subsection **Levels/Variables/Order** of the [Section 7.2.3.2](#).

## 7.2.4 Advanced tab

Advanced settings are also general settings, which are applied in all levels.



*Figure 40: Configure dialog – Advanced tab*

*Table 14: Description of Advanced tab items*

Tab items	Description
Additional identifier	Additional identifier can be changed by pressing the <b>Up</b> or <b>Down</b> buttons, or by entering the identifier manually. The first additional identifier is one. Raw time average and raw sum ignore value statuses (representativeness) and includes all period values in a total value, which is often preferred in reporting.
Additional values	In reporting, different kind of totals, like average or sum of all values are often needed. These totals are called in report configuration by Additional values. Additional values are added to all levels in report, but the items (variables) for which they are calculated is configured individually.
Add New	Adds a new additional to the configuration. A new additional is added as the last item in the list of additionals.

Table continues on next page

Tab items	Description
<b>Delete</b>	Deletes the current active additional form the configuration (visible in additional identifier).
<b>Group</b>	Group configuration is a property meant to support session parameters. If a group name is defined for a report, some fetch parameters, such as level and fetch times, are saved to the Vtrin session. When a report with the same group definitions is opened from the same Vtrin session, the level and fetch times are initialized by the last fetch.
<b>Logo</b>	Define the picture filename used for a logo if other picture name than "logo" is desired. Logo picture must be located on the server in the VtrinShared\R folder.
<b>Update</b>	<p>There are several update settings applied to all variables at all levels. Update settings have an effect when the user wants the period values to be updated from the report.</p> <p>Comment: Every update can be commented. Comments are added from the comment dialog. If the <b>Comments</b> check box is selected, every update is forced to use the comment dialog.</p> <p><b>Reading rejects updates:</b> If selected, the user must send updated values to the database before reading again, otherwise the updates are kept in memory and the user can later on send all the updated values to the database at once.</p> <p><b>Read after update:</b> If selected, the last fetch is redone automatically after the values are updated to the database.</p> <p><b>Comments button visible:</b> If selected, the <b>Comment</b> button will be visible in the report toolbar. Then user can select whether comments are needed or not.</p> <p><b>Allow update to past/future:</b> These selections can limit which time periods can be updated. If both are unselected, updating the values from the report is not possible regardless other definitions.</p>
<b>Cyclic fetch</b>	<p>Reading values can be automated, and thus it is not necessary to manually activate reading when the report is opened. This is useful in situations where the report is used for monitoring certain periods. Cyclic fetching is started from the report toolbar menu, but the interval and fetch time are defined here.</p> <p>Interval: Cycle for consecutive fetches.</p> <p>Basetime: Timing for fetches in HH:MM:SS. For example, if the cycle is 5 minutes and basetime is 00:01:30, fetches are done, for example, as follows: 16:01:30, 16:06:30, 16:11:30, etc.</p>

#### 7.2.4.1 Advanced-General tab

Table 15: Description of Advanced-general tab items

Tab items	Description
<b>Name</b>	Additional name is used as the title next to additional values.
<b>Type</b>	Additional type is defines how total values are calculated from period values (if separate fetch or calculations are not used).

#### 7.2.4.2 Advanced-Order tab

Functionality is the same as in the subsection **Levels/Variables/Order** of the [Section 7.2.3.4](#).

### 7.2.5 Chart tab

Report template can also show fetch results in trends. All the main chart types are supported. Configuration of charts is made from report configuration, not directly to charts. Each chart is available as its own worksheet, and variables/values that are added to the chart must be selected individually (by default, variables are not added chart). Charts are added from the **Charts** tab. Configurations for the added charts are made in the **Levels/Variables** tab.

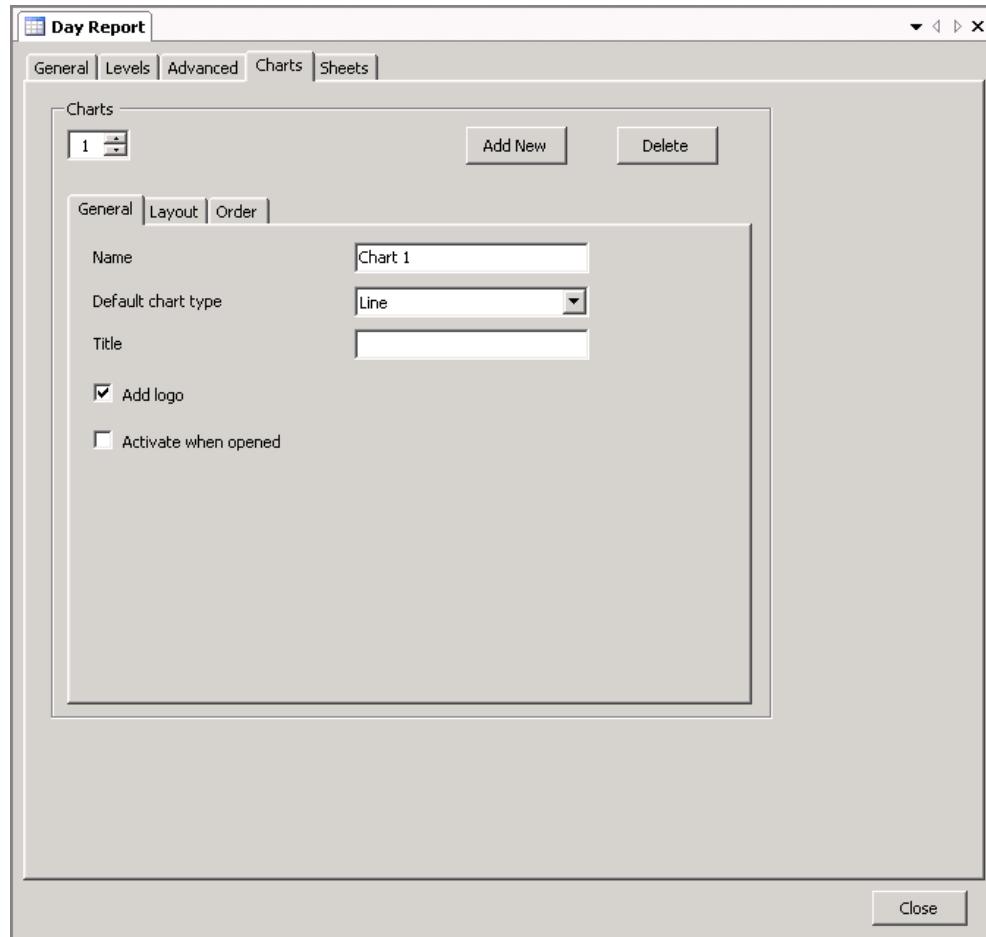


Figure 41: Configure dialog – Chart tab

Table 16: Description of Chart tab items

Tab items	Description
Chart identifier	Chart identifier can be changed by pressing the <b>Up</b> or <b>Down</b> buttons, or by entering the identifier manually. The first chart identifier is one, and charts are added to the workbook in the order of the identifiers.
<b>Add New</b>	Adds a new chart to configuration. New chart is added as the last chart in the list of charts.
<b>Delete</b>	Deletes the current active chart in configuration (visible in the Chart identifier).

### 7.2.5.1 Chart-General tab

Chart configuration has three tabs. The **General** tab has following settings:

Table 17: Description of Chart-General tab items

Tab items	Description
<b>Name</b>	Name is used as the worksheet name. The worksheet name is unique in the workbook, and thus the selected name must be unique to the sheet identifier.
<b>Default chart type</b>	Default chart type drop-down list includes all supported chart types. It is useful to select a type which will be used for most variables included in the chart.
<b>Title</b>	If given, the chart Title is used as the title of the chart, otherwise, the report titles are used instead. Newline can be also be used, for example title1\ntitle2.
<b>Add logo</b>	If Add logo is selected, the same logo that is defined to the report template sheet is also added to the chart worksheet.
<b>Activate when opened</b>	If selected, the chart worksheet is set to active when the report is opened from Vtrin.

## 7.2.5.2 Chart-Layout tab

**Layout** tab has several chart settings. Default values are used for settings that are not supported because charts are created when the report opened.

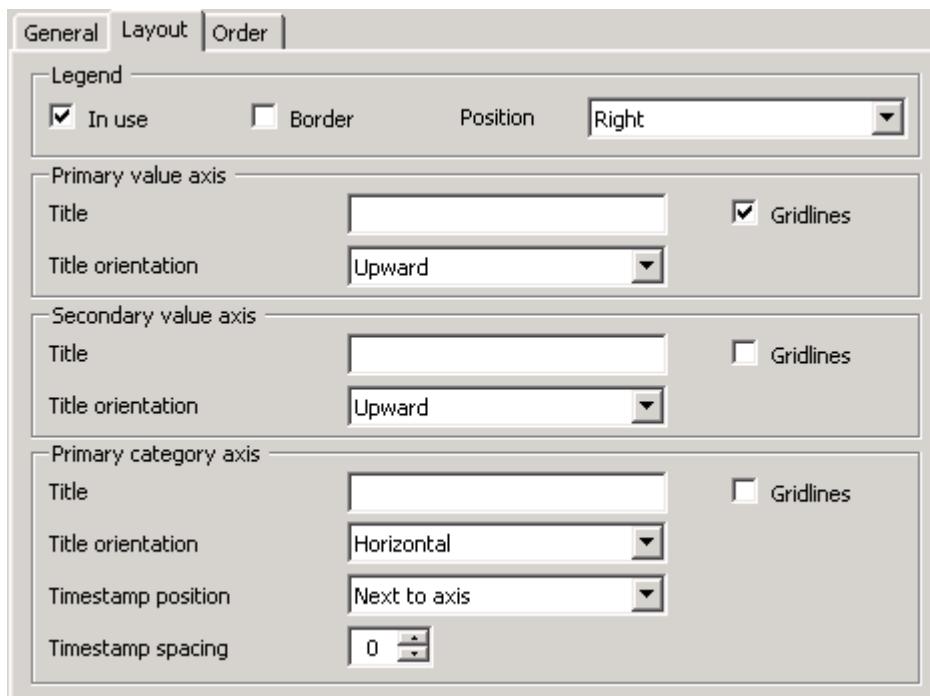


Figure 42: Configure dialog – Chart-Layout tab

*Table 18: Description of Chart-Layout tab items*

Tab items	Description
<b>Legend</b>	<p>Legend is used for variable identification (description and color). Legend can be highlighted by border and positioned to the right, bottom, left, top or to the corner.</p> <p>All the chart types, except pie, have axes. All of the axes settings are similar to each other except for primary category axis, which has two extra settings. Only primary category axis settings are explained here.</p> <p>Title and its orientation (horizontal, vertical, downward or upward) can be set if wanted. Displaying major gridlines is also optional.</p> <p>Timestamps can be positioned next to axis, high, low or none (left out).</p> <p>Timestamp spacing means that only some timestamps are printed. 0 means that the setting is automatic, 1 that every timestamp is printed, 2 that every other timestamp is printed and so on.</p>

### 7.2.5.3 Chart–Order tab

Functionality is the same as in the subsection **Levels/Variables/Order** of the [Section 7.2.3.2](#).

### 7.2.6 Sheet tab

Report template does not require any saved Excel file in order to work. If the user wants to add any own functionalities or layouts, a separate Excel file must be prepared.

Template report supports printing values to other worksheets defined by the user. The worksheets must be added to an Excel file and are only referenced in the report configuration (template report will not add, delete or rename worksheets). The name Report is used by the template report, so the user's worksheets must be named differently. Also see [Section 7.2.8](#)

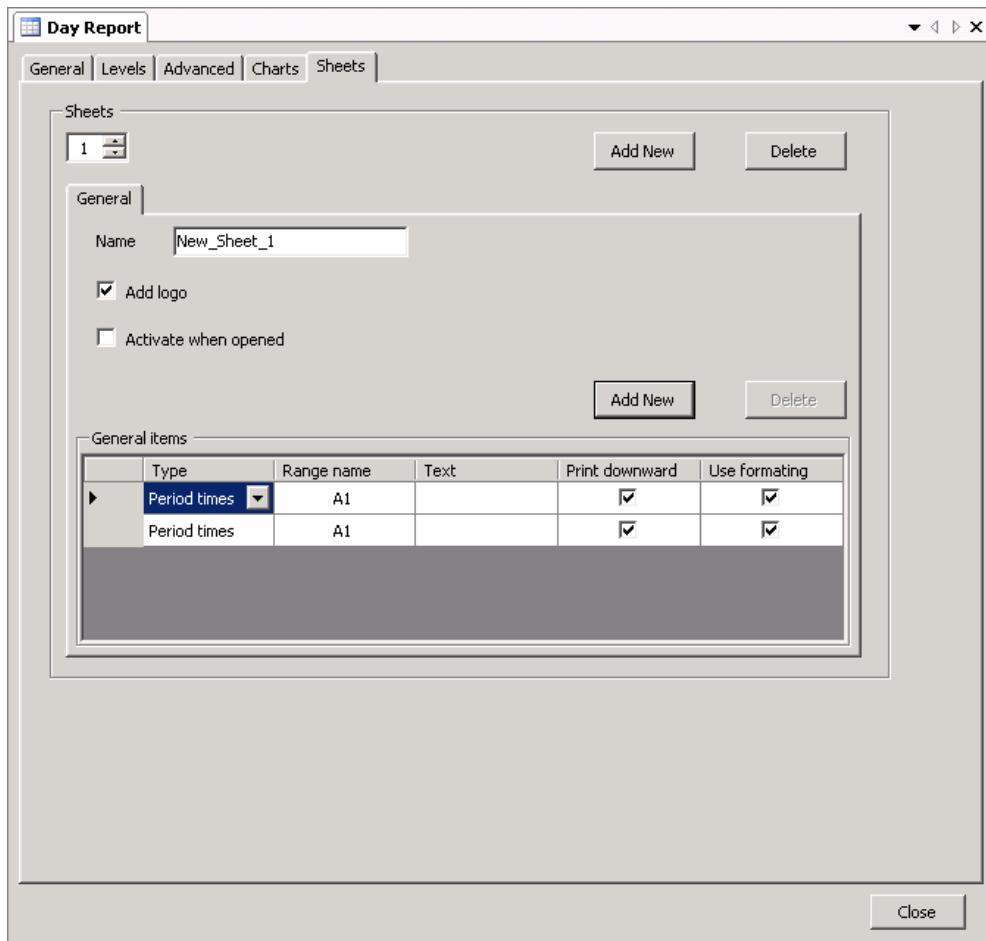


Figure 43: Configure dialog – Sheets tab

Worksheets where values are wanted to be printed are configured in the **Sheets** tab.

Table 19: Description of Sheets tab items

Tab items	Description
Sheet identifier	The Sheet identifier is used to separate sheets in configuration. Sheet identifier can be changed by pressing the <b>Up</b> or <b>Down</b> buttons, or by entering the identifier manually. The first level identifier is one.
Add New	Adds a new sheet to the configuration but not to Excel. Sheets must be added to an Excel file by the user. If there are no sheets with defined names, all functionalities related to sheets are omitted.
Delete	Deletes the current active sheet from the configuration (visible in the Sheet identifier).

### 7.2.6.1 Sheets-General

When sheet is added to report configuration it can be referenced from two places.

First place is **Sheets** tab from where non-variable related settings are done. Second place is **Levels - Variables – Sheets** tab.

Table 20: Description of Sheets-General tab items

Tab items	Description
<b>Name</b>	Name of worksheet referenced in report template. Name of worksheet must be unique in Excel.
<b>Add logo</b>	If add logo selected same logo is added also to worksheet which is defined to report template sheet.
<b>Activate when opened</b>	If selected worksheet is set active when report opened from Vtrin.
<b>Add New</b>	Adds new general item to list
<b>Delete</b>	Deletes selected general item from list. To enable <b>Delete</b> -button row header must be clicked.
<b>General items</b>	<p><b>Type:</b> Type of item. Supported item types are:</p> <ul style="list-style-type: none"> <li>• Period times: each period start time</li> <li>• Report interval: fetched time interval start – end</li> <li>• Text: constant text defined to Text column</li> <li>• User: user/username logged to Vtrin</li> <li>• Print time: time of printing</li> </ul> <p><b>Range name:</b> Range name (cell) to where item is printed in sheet. It is useful to give good names to cells manually. This makes bigger changes in layout afterward much more easier to handle. Also Excel default names can be used like A3 or C5. If range name is inside brackets [], offset to actual range location is added (do not define brackets to actual range name). Offset is equal to number of periods.</p> <p><b>Text:</b> Constant text, valid only if type is text.</p> <p><b>Print downward:</b> If there are more than one item to print, defines direction of items</p> <p><b>Use formatting:</b> If selected some formatting is added by template report if applicable. For example number format, horizontal and vertical alignment, font size and shrink to fit setting.</p>

## 7.2.7 Adding a logo to the report

The company's logo can be added to a standard report. The logo is automatically placed in the upper left hand corner of the report. The logo can be entered as a GIF, BMP, PNG or JPG format file. The name of the file must be Logo (so that the full name of the file is either Logo.gif, Logo.bmp, Logo.png or Logo.jpg). Note that the image must contain a border that separates the image from other content.

The logo file must be placed in the VtrinShared\R disk partition and directory. In addition, it must be presented in the Autoload.lst file located in the VtrinShared root directory.

```

autoload.lst - Notepad
File Edit Format View Help
Make entry here for every file you want to be loaded before any other files;
Note that "ALL" files on this list will get fetched and so adding more entries
will raise the overhead when accessing the filestore!
Note: save the file in UTF-8 format if the names contain non-ascii characters.
History for the template file:
18-JUN-2008/Jari Kulmala/CR#08-0363
    Feature: Support files for Excel reports: Logo.gif, Sys_Content and Sys_MetaData
    Bugfix: sys_Content and Sys_MetaData deleted
History for the project file:
SYMBOL_LIBRARY
PMS_COLORS.COL
// R\RTDBReport.xla
// R\RTDBReportvtrin.xla
// R\Report Template.xla
R\Logo.gif
R\Report Template.xla
R\RTDBReport.xla
R\RTDBReportvtrin.xla
R\VtrinRetriever.xla
Ln 22, Col 1

```

Figure 44: Defining Logo.gif in Autoload.lst file

Notice that the logo is a configuration shared by all standard reports, so that once the logo is set, it is displayed in all the standard reports of the same system. Because the logo file is copied into the working directory of all workstations, to change the file format of the logo (for example between GIF and JGP), the old file must be deleted from the working directories of all workstations. This can be done by deleting each user's own C:\Users\<username>\AppData\Local\IsolatedStorage directory and the subdirectories it contains.

## 7.2.8 User tailored Excel file

By default, template report starts always with new empty workbook. Report template is adding worksheet called Report to workbook for its own use.

If there is need for own report layout user can use also predefined Excel file. Template report supports printing results also to other worksheets where user is designed layout. Prepare Excel file not having worksheet called Report. Preferred location for file is the server where database is running, because from there file can be copied to other clients without network mappings. If any other location used take care that folder is mapped before opening report.

Vtrin is supporting file sharing between clients and server (original file). If file is located under VtrinShared folder, Vtrin can copy it to client PCs. In addition if file is modified and saved in client, new version can be copied back to server. Preferred location for report Excel files is D:\sc\Historian\VtrinShared\R (disc letter may differ). In Vtrin tree item that is referenced by :R. For example if file name is MyWorkbook.xls, add ":R\MyWorkbook.xls" to Command line parameter. Make sure that there is space before additional parameters.

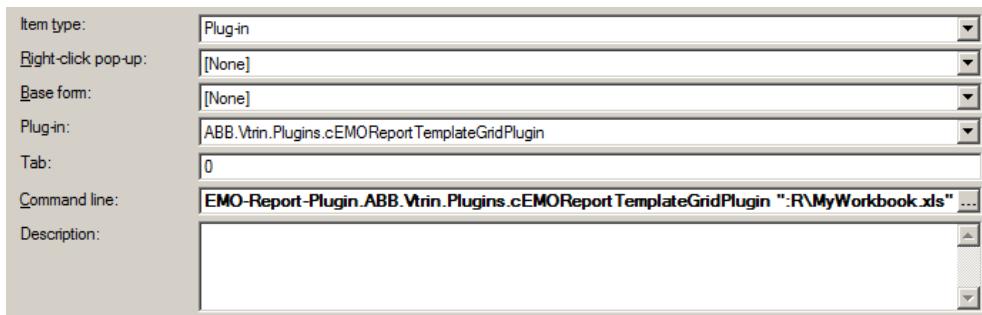
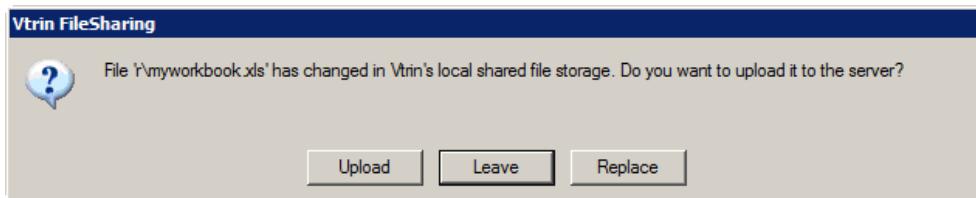
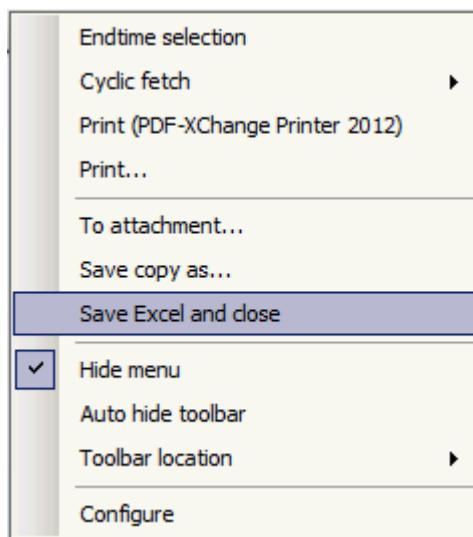


Figure 45: Vtrin tree item configuration for user tailored report

Excel file is opened by default in read-only mode. If user wants to save Excel file from client, add also /RW ("":R\MyWorkbook.xls/RW") after file parameter. Also make sure that original file in server can be overwritten. When report is closed and Vtrin detects changed file, it asks if file should be copied to server too (Click **Upload**).



Remember to use **Save Excel and close** from report menu when there is need for saving file. Otherwise all extra items (additional worksheet and logos) added by report template are also saved.





# Section 8 References to Windows

References to windows (charts, lists, etc.) can be defined in the tree for variables. The references allows for faster access to windows that are viewed often in connection with a certain variable or all variables.

When a connected variable, for example in a chart legend or a variable list, is right-clicked, the **Send To** command on the right-click pop-up menu shows the connected windows, which can then be opened by clicking.

In the figure [Figure 46](#), variable T\_HIS\_COUNTER shown in the chart legend is connected to the **Diary** list window as well as the **T\_HIS\_N\_Trend** and **New Trend** chart windows. Right-clicking the row of the variable and then clicking **Send To** shows the names of these windows, which can be opened by clicking.

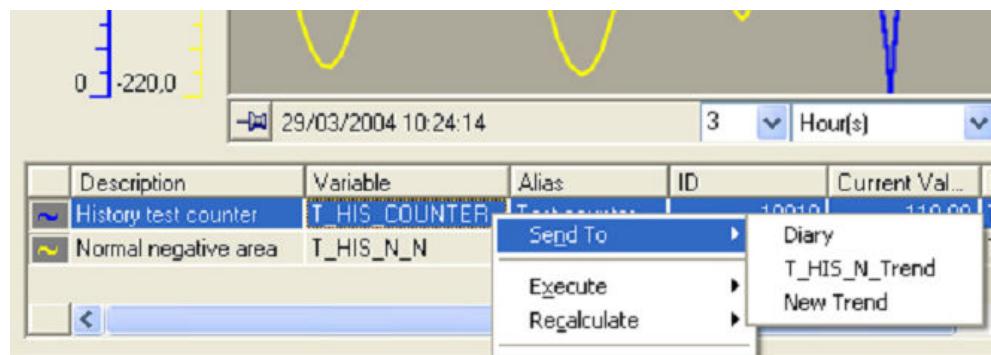


Figure 46: Viewing connected windows with command **Send To**

## 8.1 To define references to windows

Define the references in the **References** window. Open **Reference Configuration**, through the **Maintenance** folder inside the Definition lists.

To add a reference to a window:

- Fetch the desired variable to middle display (for example SYS\_CPU0\_Time, like in [Figure 47](#)).
- Fetch the desired view to the upper display (for example CPU load and CPU current, like in [Figure 47](#)).
- Add a new row to lower display by choosing **Edit**. The option **New** will become available to create a new row.
- Input the desired information:
  - Text:** The given name that will appear in the Send to box.
  - Sort Key:** Variable that will define the sorting order
  - Source Type:** Type of the given information
  - Source ID :** ID of the variable
  - Target Type:** TreeNode as default
  - Target ID:** ID in the upper display (defined the connected window).

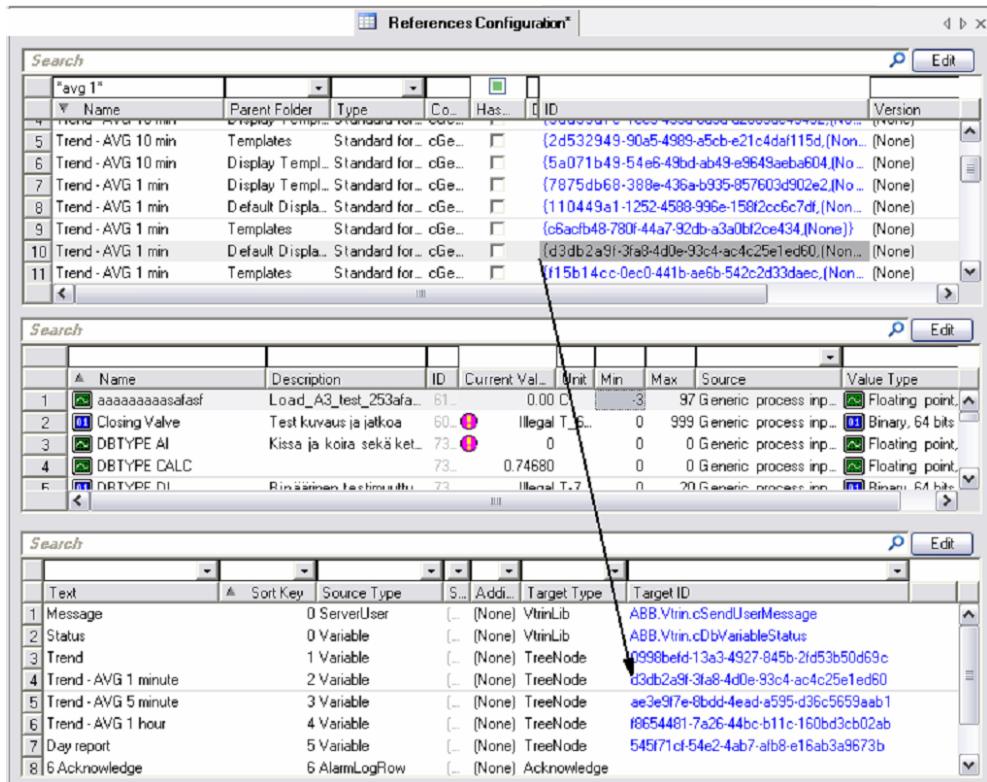


Figure 47: Defining references

- To add a new reference in the **Reference** window, first insert a new row by clicking **Edit** and **New**.
- Find the ID of the variable in the **Variables** window. Click the ellipsis (...) button in the **Source ID** column of the **Reference** window and enter the variable ID in the opening edit dialog box. If the button is not visible if, for example, changing an existing variable ID, first click the **Source ID** column on the row.
- If the user leaves (None) in the column, all variables are connected to the window specified on the row.
- After making the desired references, click **Commit** to commit the changes and answer Yes in the confirmation box. Click **Revert** to exit the editing mode.
- It is now possible to check in the **Variables** window that the windows that were connected to the variable are shown in the pop-up menu when the variable is first right-clicked and **Send To** is selected, as shown in Figure 47.

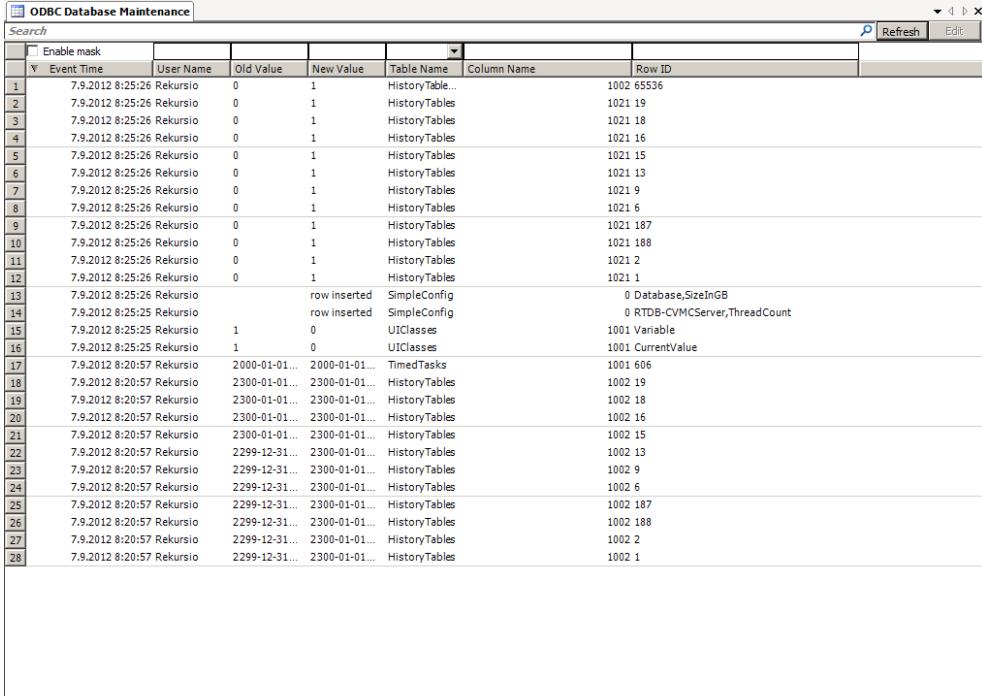
# Section 9 Administration Logs and Lists

Windows ODBC Maintenance Log ([Section 9.1](#)) and User Logs ([Section 9.2](#)), help the user to monitor SQL maintenance operations and user logins and logouts, as well as view the users of the system.

- The windows are viewed like list windows. For example, rows can be searched with string and time masks as well as order rows according to the selected columns.
- Click a row to view its properties shown in the log/list columns in the rows of the **Properties** window. If the **Properties** window is not visible, click **Properties** on the Vtrin tool bar. The **Properties** window can be dragged to a detached window as in [Figure 48](#) to view more rows at the same time. For more information, see the Historian Operation manual.
- Find out the meaning of the log/list columns by clicking a row in the **Properties** window. The explanation of the column is shown at the bottom of the window.

## 9.1 SQL Maintenance Log

The **ODBC Database Maintenance** window, which resides in the **Maintenance/System/System Logs** folder of the Vtrin tree, shows maintenance operations performed in SYS600 Historian through ODBC. The log shows the operations to tables that have been defined to be monitored.



The screenshot shows a Windows application window titled "ODBC Database Maintenance". The window has a standard title bar with icons for minimize, maximize, and close. Below the title bar is a toolbar with a search icon, a refresh button labeled "Refresh", and an edit button labeled "Edit". The main area is a grid table with the following columns: "Event Time", "User Name", "Old Value", "New Value", "Table Name", "Column Name", and "Row ID". The table contains approximately 30 rows of data, each representing a database operation. The "Table Name" column consistently shows "HistoryTables". The "Column Name" column shows various names like "HistoryTable...", "SimpleConfig", "UIClasses", and "TimedTasks". The "Row ID" column shows numerical values ranging from 1002 to 1002 188. Some rows have additional details in the "New Value" column, such as "row inserted" followed by variable names like "Database,SizeInGB" and "RTDB-CVMCServer,ThreadCount".

Event Time	User Name	Old Value	New Value	Table Name	Column Name	Row ID
1	7.9.2012 8:25:26 Rekursio	0	1	HistoryTables	HistoryTable...	1002 65536
2	7.9.2012 8:25:26 Rekursio	0	1	HistoryTables		1021 19
3	7.9.2012 8:25:26 Rekursio	0	1	HistoryTables		1021 18
4	7.9.2012 8:25:26 Rekursio	0	1	HistoryTables		1021 16
5	7.9.2012 8:25:26 Rekursio	0	1	HistoryTables		1021 15
6	7.9.2012 8:25:26 Rekursio	0	1	HistoryTables		1021 13
7	7.9.2012 8:25:26 Rekursio	0	1	HistoryTables		1021 9
8	7.9.2012 8:25:26 Rekursio	0	1	HistoryTables		1021 6
9	7.9.2012 8:25:26 Rekursio	0	1	HistoryTables		1021 187
10	7.9.2012 8:25:26 Rekursio	0	1	HistoryTables		1021 188
11	7.9.2012 8:25:26 Rekursio	0	1	HistoryTables		1021 2
12	7.9.2012 8:25:26 Rekursio	0	1	HistoryTables		1021 1
13	7.9.2012 8:25:26 Rekursio		row inserted	SimpleConfig	0 Database,SizeInGB	
14	7.9.2012 8:25:25 Rekursio		row inserted	SimpleConfig	0 RTDB-CVMCServer,ThreadCount	
15	7.9.2012 8:25:25 Rekursio	1	0	UIClasses	1001 Variable	
16	7.9.2012 8:25:25 Rekursio	1	0	UIClasses	1001 CurrentValue	
17	7.9.2012 8:20:57 Rekursio	2000-01-01...	2000-01-01...	TimedTasks		1001 606
18	7.9.2012 8:20:57 Rekursio	2300-01-01...	2300-01-01...	HistoryTables		1002 19
19	7.9.2012 8:20:57 Rekursio	2300-01-01...	2300-01-01...	HistoryTables		1002 18
20	7.9.2012 8:20:57 Rekursio	2300-01-01...	2300-01-01...	HistoryTables		1002 16
21	7.9.2012 8:20:57 Rekursio	2300-01-01...	2300-01-01...	HistoryTables		1002 15
22	7.9.2012 8:20:57 Rekursio	2299-12-31...	2300-01-01...	HistoryTables		1002 13
23	7.9.2012 8:20:57 Rekursio	2299-12-31...	2300-01-01...	HistoryTables		1002 9
24	7.9.2012 8:20:57 Rekursio	2299-12-31...	2300-01-01...	HistoryTables		1002 6
25	7.9.2012 8:20:57 Rekursio	2299-12-31...	2300-01-01...	HistoryTables		1002 187
26	7.9.2012 8:20:57 Rekursio	2299-12-31...	2300-01-01...	HistoryTables		1002 188
27	7.9.2012 8:20:57 Rekursio	2299-12-31...	2300-01-01...	HistoryTables		1002 2
28	7.9.2012 8:20:57 Rekursio	2299-12-31...	2300-01-01...	HistoryTables		1002 1

Figure 48: SQL Maintenance Log

## 9.2 User Logs

The Login Logs window, which resides in the **Maintenance/System/Users** folder of the Vtrin tree, shows user logins and logouts. A login means the creation of an ODBC connection to the database. The logins that occur during a configurable logging period (usually eight hours) are combined on the same row.

Name	Description	First Login Time	Last Login...
1 SYSTEM		9/18/2002 4:56 PM	11/22/2006 1:15...
2 HENI		6/13/2002 12:34 PM	11/21/2006 1:15...
3 administrator		2/14/2003 9:43 AM	11/16/2006 3:13...
4 Tapani		3/9/2005 3:34 PM	8/29/2006 7:56...
5 odbc		2/2/2006 12:42 PM	2/2/2006 3:34 PM
6 guest		6/13/2002 12:24 PM	11/22/2005 2:28...
7 tovi		1/1/1601 1:39 AM	1/1/1601 1:39 AM
8 JuVe		1/1/1601 1:39 AM	1/1/1601 1:39 AM
9 rihy		1/1/1601 1:39 AM	1/1/1601 1:39 AM
10 maja		1/1/1601 1:39 AM	1/1/1601 1:39 AM
11 kyee		1/1/1601 1:39 AM	1/1/1601 1:39 AM
12 Customer		1/1/1601 1:39 AM	1/1/1601 1:39 AM
13 KAVA		1/1/1601 1:39 AM	1/1/1601 1:39 AM

Figure 49: Users window

User Name	User Full Name	IP-Address	Client Computer	Connect Time	Inactivity Counter	Call Count	Bytes Out
1 ANKKALINNA\... ???		10.58.44.30	heimo.ankkalinn...	11/21/2006 1:25 PM	0	16232	20188923
2 ANKKALINNA\... Jukka Vesanen	Jukka Vesanen	10.58.171...	fihel-2000929.fi...	11/22/2006 9:53 AM	0	2819	6994155
3 ANKKALINNA\... Heimo Nieminen	Heimo Nieminen	10.58.44.1...	fihel-w-4000309	11/22/2006 12:45 PM	0	2018	2374827

Figure 50: Active Users window

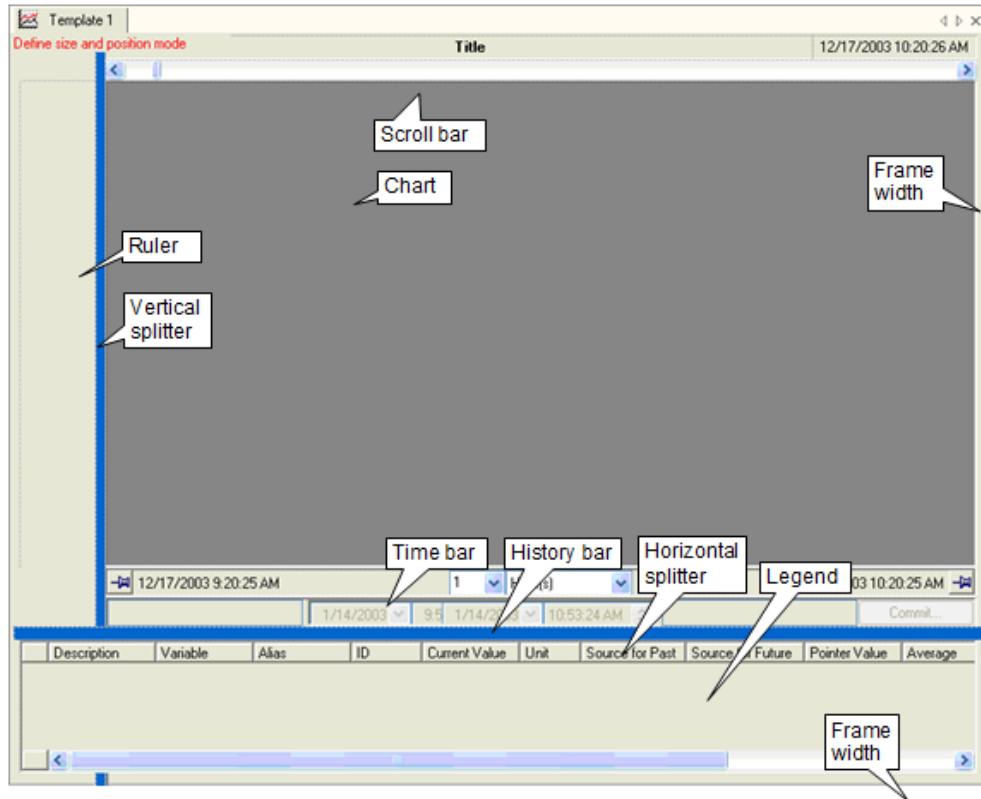
User Name	Update Time	Login Time	Last Login Time	Logout Time	Login Count	Elapsed Time	Logout Count	Description
1 henri	11/22/2006 1:14...	11/21/2006 3:44...	11/21/2006 3:4...		52	185079.19:12...		50 ODBC;iTO=1
2 SYSTEM	11/22/2006 1:14...	11/21/2006 10...	11/21/2006 3:57...	11/21/2006 3:5...	96	830507.18:11...		65 ODBC;iTO=1
3 henri	11/22/2006 12:3...	11/22/2006 9...	11/22/2006 12:3...	11/22/2006 12...	11	231.19.05:21...		11 ODBC;iTO=1
4 SYSTEM	11/22/2006 1:15...	11/22/2006 12...	11/22/2006 1:15...	11/22/2006 1:1...	2	37.15:44.39:1...		2 ODBC;iTO=1
5 SYSTEM	11/21/2006 9:07...	11/21/2006 4...	11/21/2006 9:06...	11/21/2006 9:0...	12	270.17:12.30...		12 ODBC;iTO=8
6 henri	11/21/2006 4:22...	11/21/2006 4...	11/21/2006 4:21...	11/21/2006 4:2...	1	19.19:29.49:0...		1 ODBC;iTO=7
7 SYSTEM	11/21/2006 10:3...	11/16/2006 8...	11/16/2006 2:57...	11/20/2006 9:2...	51	51.95028.06:4...		36 ODBC;iTO=
8 SYSTEM	11/21/2006 10:3...	11/20/2006 9...	11/20/2006 2:26...	11/21/2006 10:...	29	361723.15:37...		29 ODBC;iTO=2
9 henri	11/21/2006 10:3...	11/16/2006 4...	11/16/2006 4:19...	11/16/2006 4:1...	3	411230.11:58...		2 ODBC;iTO=3
10 henri	11/21/2006 10:3...	11/20/2006 4...	11/20/2006 4:42...	11/20/2006 4:4...	9	85735.19:05...		8 ODBC;iTO=9

Figure 51: User Log window

# Section 10      Templates

## 10.1      Introduction

A template is a collection of controls, for example chart, legend, ruler, etc., with a specified layout and properties. Templates are used for creating application chart windows that present data in a graphical form. [Figure 52](#) shows an example of a template.



*Figure 52: Example of a template*

When creating a chart windows, the user can take an appropriate template as the basis for it and then add variables and specify how they are presented. For instance, to create a chart window showing trend plots ([Figure 53](#)), the template in [Figure 52](#) can be used, add two variables and specify them to be shown as trend plots in suitable colors.

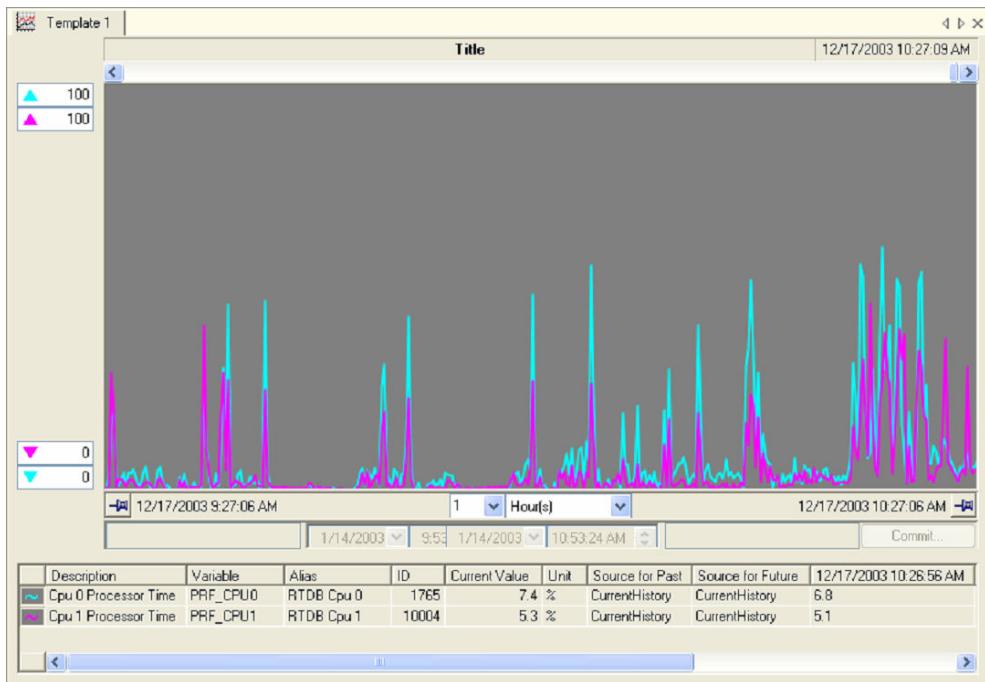


Figure 53: A trend plot chart using the example template

Templates are basically like chart windows. What makes them templates is that they are stored in the **Maintenance/Display Library/Display Templates** folder. When creating a new chart node in the navigation tree, the menu shows the templates in the template folders (on the right in the figure below). Templates from different folders are separated by a horizontal line in the menu.

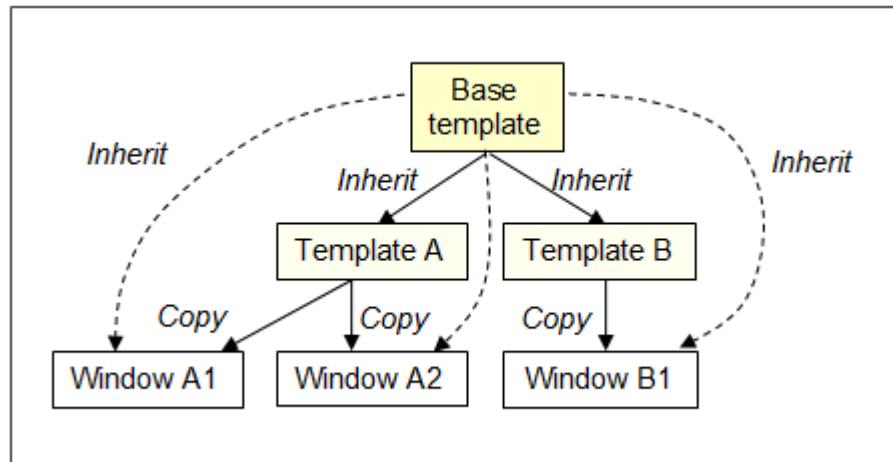
Another important aspect of templates is inheritance, which is handled in [Section 10.2](#).

## 10.2 Inheritance, Templates and Base Templates

A chart window can inherit controls from another chart window, called the base. When controls are changed or added in the base, the changes and additions are also seen in the inheritor. Inheritance makes it easier to achieve a uniform look for the chart windows.

Inheritance of the chart windows is implemented with both base templates and templates. Base templates are chart windows where the user adds the controls that should be inherited. Templates are otherwise empty (usually) chart windows that are specified to inherit a given base template.

When the user creates a new chart node in the tree by selecting a template from the opened menu as the basis, they actually make a copy of the selected template. As a result, the chart window inherits the same base template as the template, and therefore the changes in the base template will also affect the chart window. See [Figure 54](#).



*Figure 54: Templates and base templates*

Base templates can inherit another base template. It is also possible to add controls to templates, but the chart windows do not inherit these. However, the controls are copied to the chart window when it is created.

Base templates are placed in an ordinary folder. Templates are placed in a template folder, i.e. a folder whose type is template folder. Several folders can be used for base templates. When creating a new item in the tree, the menu shows templates in all the template folders.

Developers and administrators create and maintain the base templates and create the corresponding templates in the template folder(s). The end users should see and use the templates only.

## 10.2.1 Inheritance Rules

When the user creates a new chart window using a template that inherits a base template, the following holds true for the new chart window after creation:

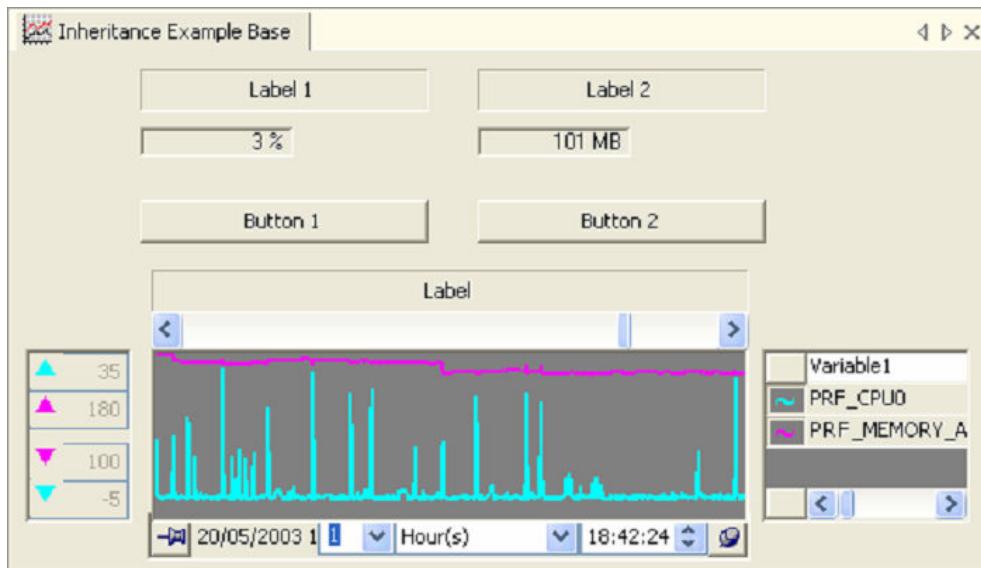
- Size and position of the controls are the same as in the base template.
- Properties, e.g. color and fixed text of the controls are the same as in the base template.
- Variables connected to the current values and symbols are the same as in the base template.
- No variables are connected to charts (or other collection type controls), even if variables are connected to them in the base template.

In the new chart (inheritor):

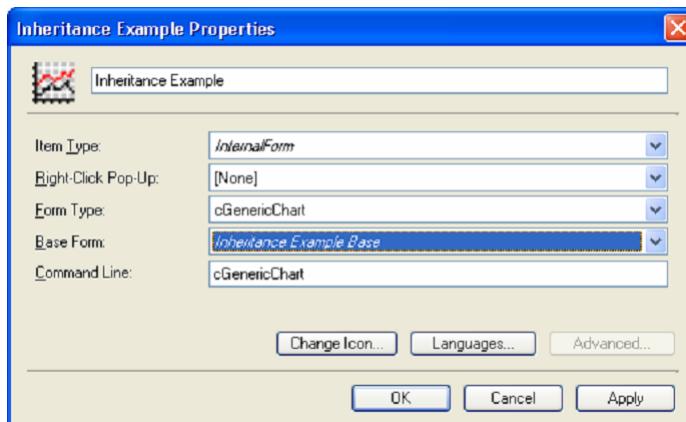
- The size and position of the inherited controls cannot be modified, nor can they be deleted.
- The control properties like color, text, etc. can be modified.
- The variables connected to current values and symbols can be changed.
- Variable items can be added to charts and their appearance can be specified.
- If the inherited properties or variable items are changed, any later changes in the base template do not affect them anymore. If they are not changed, the changes made in the base template will also be seen in the inheritor.
- New controls can be added.

## 10.2.2 Inheritance Example

As an example of how inheritance works, let us create a base template called Inheritance Example Base (in the figure below) in the folder Base Templates RTDB. See [Section 10.3.2](#).

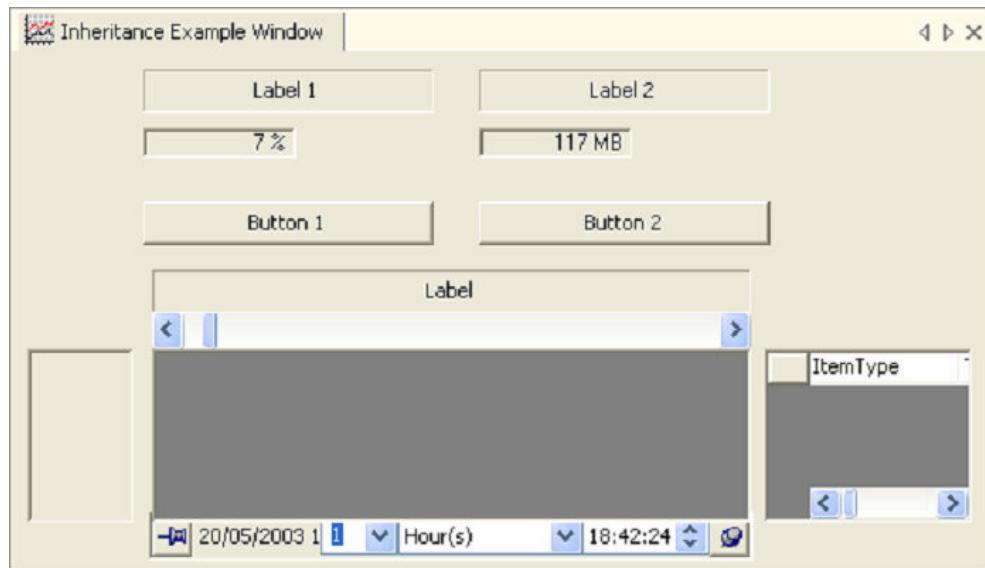


In the template folder Templates RTDB, a template (commands **New/Folder**) called Inheritance Example that inherits this base template is created. Inheritance is defined by selecting the name of the base template in box **Base form** in the **Properties** dialog box for the template (see the figure below).

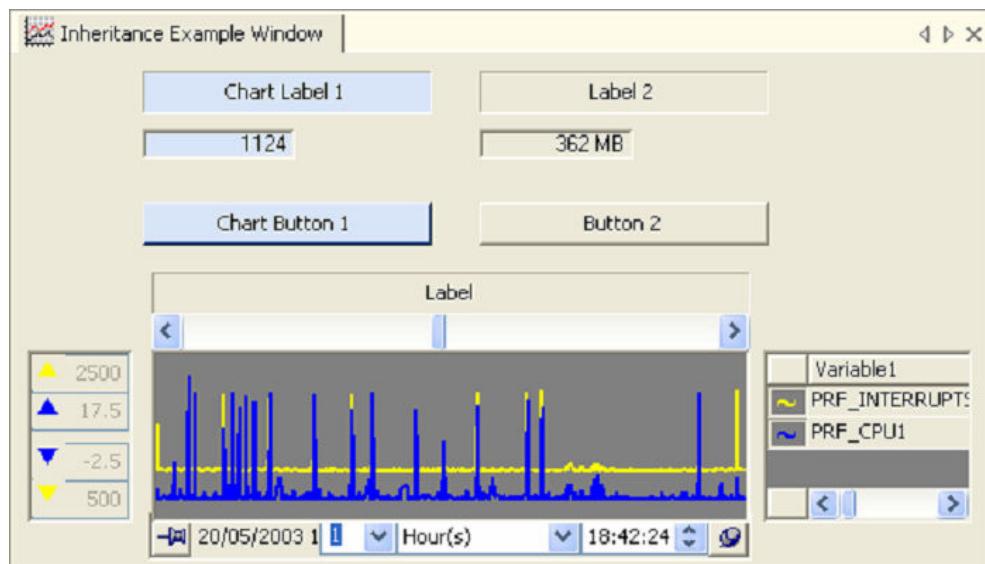


Then a new chart node called Inheritance Example Window is created by selecting the template Inheritance Example from the menu that shows all templates (left in the figure below). This is effectively the same as making a copy of the template with commands **Copy** and **Paste**.

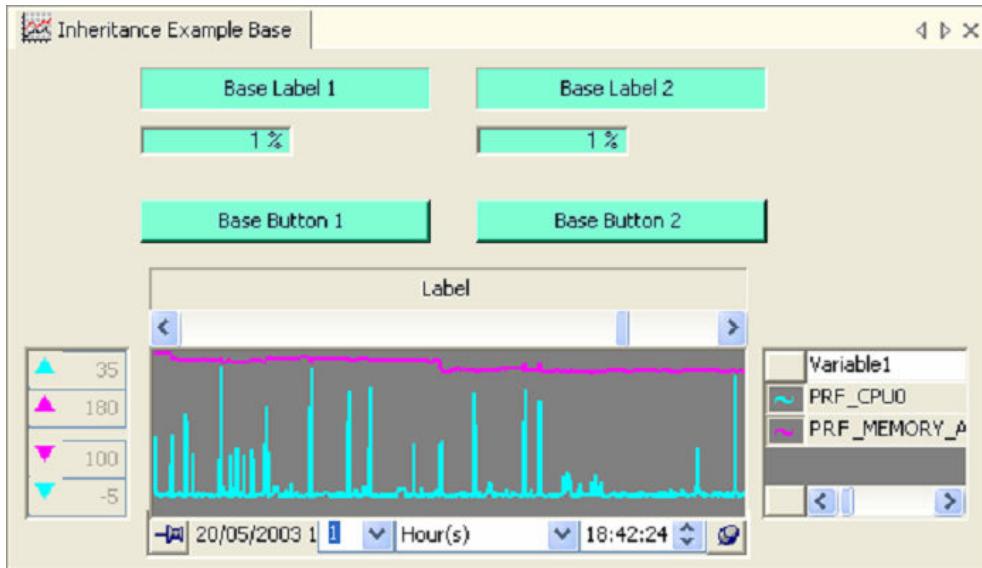
When the Inheritance Example Window (see the figure below) is opened, it is apparent that it has inherited the controls with their sizes and positions as well as the variables connected to the current values. The variables in the chart are not inherited.



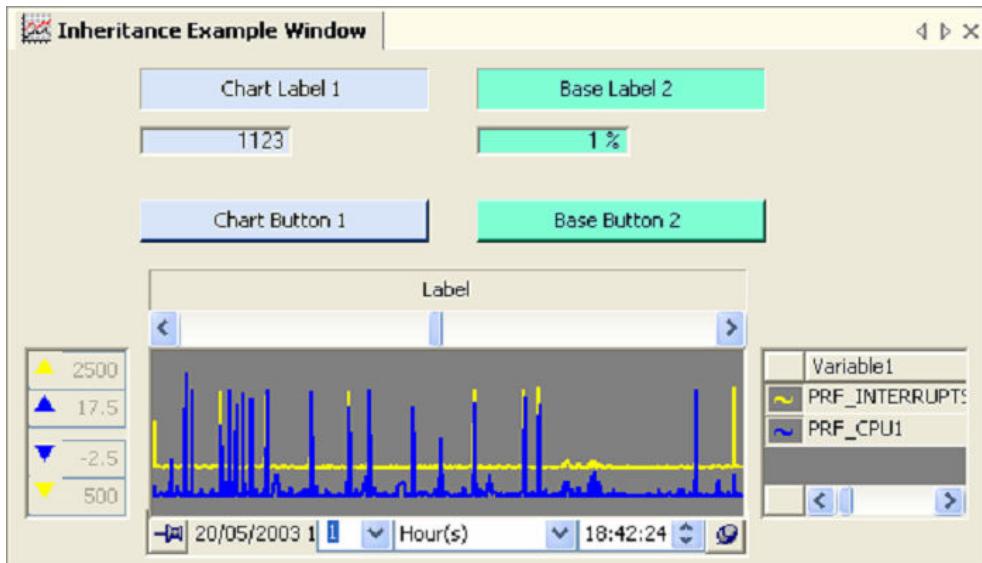
The color and text of the leftmost labels and buttons and the color and variable in the left current value in Inheritance Example Window (see the figure below) is now changed. In addition, two variable items are added to the chart.



Then the colors and texts of all labels and buttons and colors and variables of current values and chart items in the base template are changed as in the figure below.



The changes made to the rightmost controls will be visible in Inheritance Example Window when it is reopened (see the figure below). The changes made to the leftmost controls are no longer inherited because these controls have been changed in Inheritance Example Window.



## 10.3 Creating Templates

Creating templates consists of the following steps:

- Create the base template.
  - Create an empty base template or make a copy of an existing base template or chart node in the base template folder ([Section 10.3.2](#)).
  - Add controls (see [Section 10.3.3](#)).
  - Define the position and size of the controls (see [Section 10.3.4](#)).
  - Define properties of the controls (see [Section 10.3.5](#)).
  - Define the anchors of the controls (see [Section 10.3.6](#)).
  - Connect the controls (see [Section 10.3.7](#)).
- Create the template (see [Section 10.3.8](#)).

## 10.3.1 Layout Definition and Run Modes

The default mode is the Run mode where the user can view chart windows and add data to them. The user can define templates in the Layout definition mode. Design mode can be turned on and off by clicking the **Design** button in the toolbar.

The Layout definition mode is divided into three different sub modes. The sub modes are the following:

- Define size and position mode: Default Layout definition sub mode, used for adding controls and changing their positions, sizes and properties.
- Define anchors mode: For defining how the controls are anchored in relation to each other and the chart window.
- Define connections mode: For defining which controls are associated with the same data.

When the program is in the Layout definition mode, the button and the name of the current sub can be seen mode in the upper left corner of the window.



When an inherited control is clicked, the text "Inherited" with yellow background appears over the sub mode text. See [Section 10.2.1](#).

Return to the Run mode by clicking **Design** button in the toolbar, or by right-clicking the empty background and clicking the **Layout Definition Mode** command that now has a selection mark beside it.

## 10.3.2 Creating a Base Template in a Base Template Folder

Base templates can be created in a base template folder in the navigation tree. Base template folders should be located in the Maintenance folder. The recommended folder names are Base Templates X, where X stands for project name.

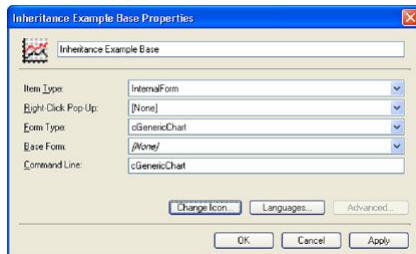
### 10.3.2.1 To create a template from an existing base template or chart window

1. Right-click the icon or name of the base template or chart node that will be used as the basis for the new base template and click **Copy**.
2. Right-click the base template folder where the base template will be created and click **Paste**.
3. Right-click the base template icon or name and click **Rename**. Enter the desired name.
4. Right-click the base template icon or name and click **Properties**. Ensure that the Base form check box contains None (unless another base template should also be inherited).

### 10.3.2.2 To create a new base template from scratch

A folder item can first be created in the base template folder, and then its type can be changed to a chart.

1. Right-click the icon or name of the base template folder where the new base template will be created. Point to **New** and then click **Folder**.  
A new folder item appears as the bottommost item with the name New Folder.
2. Change the name to a suitable name for the base template.
3. Right-click the icon or name and then click **Properties**.
4. Select InternalForm as the item type and cGenericChart (default) as the form type. Click **Change Icon** to select a suitable icon.



## 10.3.3 Adding Controls

Controls and sub controls can be added to the chart window in the Define size and position mode. Sub controls are controls that are added inside another control, the so called parent control.

### 10.3.3.1 To add controls

1. Ensure that the program is in the Define size and position mode. For more information on how to get there, see [Section 10.3.1](#).
2. To add a control, right-click the empty background in the chart window, point to **Add**, and click the desired control on the pop-up menu.  
OR
3. To add a sub control inside another control, right-click the control, point to **Add Sub Control**, and click the desired control on the pop-up menu.
4. Repeat until all necessary controls have been added.

The following controls are available in the chart window:

- **Chart:** Can contain various other controls. In chart windows, refreshed graphs of variables are shown in a chart control, see [Figure 52](#). Graphs are not controls.
- **Current Value:** Shows the refreshed value of a variable.
- **Horizontal Splitter:** Horizontal separator bar. The height of the controls to which horizontal splitters are anchored can be changed by dragging the splitters in the Run mode. See [Figure 52](#).



Place splitters under other controls so that they never cover the adjoining controls, even if the positioning of the splitters is not very accurate. To do this, right-click the splitter and then click **Send To Back**. Define the height of the horizontal splitters so that it extends over the chart window or the parent control. Once this is done, the Anchoring is correct. For more information, see [Section 10.3.6](#).

- **History Bar:** Shows the start and end times when a part of the time span for history updating or zooming is selected in the Run mode. It also contains the **Commit** button for opening the **History Updating** dialog box. This makes the history bar obligatory in templates used for those chart windows where history updating is allowed. Zooming is possible even without the history bar. See [Figure 52](#).
- **Label:** Contains fixed text.



Make the labels 3D (property **BorderStyle = Fixed3D**) and center the text ( **TextAlign = MiddleCenter**).

- **Legend:** Shows rows of information of the variables that are presented as graphs in the chart in the Run mode. Each row contains, for example, an icon in the color of the graph. See [Figure 52](#).
- **Link Label:**
- **Ruler:** Shows graph limits or axes in the Run mode. See [Figure 52](#).

- **Scroll Bar:** In the Run mode, the user can scroll the contents of the controls to which it is connected with the scroll bar. See [Figure 52](#).
- **Time Bar:** Shows the time span, column width, and start and end times of the graphs in the chart in the Run mode. See [Figure 52](#).
- **Vertical Splitter:** Vertical separator bar. Dragging the vertical splitters in the Run mode changes the width of the controls to which they are anchored. See [Figure 52](#).



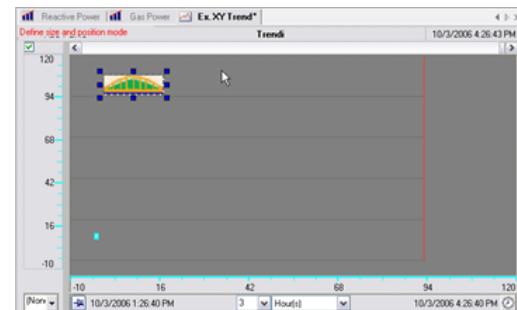
Place splitters under other controls so that they never cover the adjoining controls, even if the positioning of the splitters is not very accurate. To do this, right-click the splitter and then click **Send to Back**. Define the width of the vertical splitters so that it extends over the chart window or the parent control. Once this has been done, the Anchoring is correct. For more information, see [Section 10.3.6](#).

- **Panel:** The user can group for example buttons and labels inside a panel.
- **Other:** Other controls are available by clicking this command.

## 10.3.4 Defining the Position and Size of the Controls

Define the position and size of the controls in the Define size and position mode.

- Ensure that the program is in the Define size and position mode. For more information on how to get there, see [Section 10.3.1](#).
- Drag the controls to the desired positions and resize them by dragging the handles. Several controls can be moved at the same time if they are first grouped.



### 10.3.4.1 To temporarily select a group of controls

- Hold down the ALT key and select the area of the controls holding down the left mouse button (rectangle select), or hold down the SHIFT key and left-click the controls one by one.
- Release the ALT key and mouse button or release the SHIFT key.
- Left-click the control that will be used as the reference. There are blue handle squares around the reference control, the handles of other selected controls are white (the handles of the inherited reference control are dimmed.)



Only same level controls can be grouped together, either main level controls only, or subcontrols of a control only.

### 10.3.4.2 To remove a control from a selection group

- Hold down the SHIFT key and left-click the control. (Clicking the same control again holding the SHIFT key down adds the control to the selection group).

### 10.3.4.3 To cancel the selection group

- Click the empty background in the chart window or any control outside the selection group.

#### 10.3.4.4 To adjust the size, position or layout of the controls

- Select the controls that need to be adjusted.
- Right-click the Reference control (with blue handles) to display the pop-up menu and left-click the desired function in the pop-up menu.

Menu term	Description
Align	Aligns other selected controls to the reference control so that the reference control is not moved but the other controls are aligned to Left, Center, Right, Top, Middle or Bottom of the reference control according to the user's selection.
Make Same Size	Makes Width, Height or Both of the other selected controls the same size as the reference control according to the user's selection.
Tile	Tiles the selected controls (Horizontally or Vertically) bound to each other so that the reference control is not moved but the other controls are moved according to the user's selection.
Increase spacing	Increases spacing between the reference control and the other selected controls so that the reference control is not moved but the distance between it and the other controls is increased by the same step, either Horizontally or Vertically, according to the user's selection.
Decrease spacing	Decreases spacing between the reference control and the other selected controls so that the reference control is not moved but the distance between it and the other controls is decreased by the same step, either Horizontally or Vertically, according to the user's selection.
Make Spacing Equal	Distributes the selected controls evenly either Horizontally or Vertically so that the outermost controls are not moved but the distances between the controls are made even according to the user's selection.
Move	Moves all the selected controls Left, Right, Up or Down according to the user's selection.

#### 10.3.5 Defining Properties of the Controls

When the program is in the Size and Position mode, the properties of the selected control can be seen in the lower left corner of the Vtrin window.

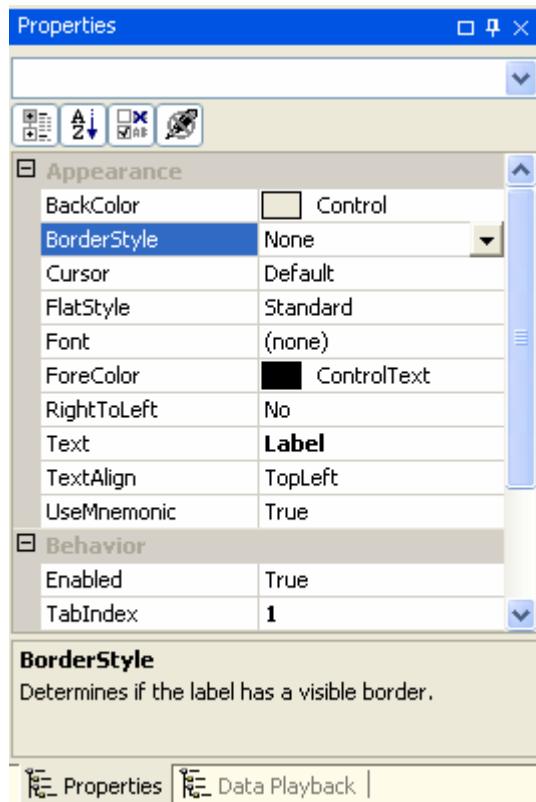


Figure 55: Control properties

If the **Properties** window is not visible, click the **Properties** tab at the bottom to display it.

At the top, the name and type of the control selected in the template can be seen.

The list (see [Figure 55](#)) shows the properties of the controls. The properties of the different control types vary. The left column shows the property name and the right one the property value. Below the list there is an explanation text for the selected property.

Above the list there are buttons, with which the user can control how the properties are shown on the list. When a function is selected, the button background color turns white. The button functionalities are:

- Categorized: Shows the properties listed under property categories, for example Appearance and Behavior. Category rows are marked with a grey background. The properties belonging to the category are listed in the rows under it.
- Sort alphabetically: Orders the properties alphabetically.
- Selected only: Not applicable to templates.
- Include read-only: Shows also the read-only properties that cannot be modified. Read-only properties are dimmed when shown on the list.

#### 10.3.5.1 To change a property value

- Ensure that the program is in the Define size and position mode.
- Click the property row.
- Click the arrow button and select the desired option from the list.

#### 10.3.6 Defining the Anchors of the Controls

With anchors, the user can specify how the controls are moved and resized in the Run mode when the window is resized or the splitters are dragged to resize controls. Anchors can be

seen and modified in the Define anchors mode. After specifying the anchors, check in the Run mode that the window behaves as planned.

There are three kinds of anchors:

- Fixed (red square with a white connector line): The edge with a red anchor always remains at a fixed length from the control or window edge to which the anchor is connected with the white line.
- None (grey square): The edge is not anchored anywhere. When a horizontal edge is not anchored, the control maintains its height. When a vertical edge is not anchored, the control maintains its width. When both a horizontal and a vertical edge of a control are not anchored, the control maintains its size.
- Background (white square): The edges with white anchors maintain their proportional position in relation to the window. They can be seen as pins that are attached to an elastic background. When the background is stretched, the elastic control moves with it.



The anchor squares of an inherited control are dimmed. See [Section 10.2.1](#).

The following examples aim to clarify the effect of the different anchors.

The positions of all edges with background anchors remain in proportion with the window when the window is resized. The size of the control changes accordingly. See [Figure 56](#).



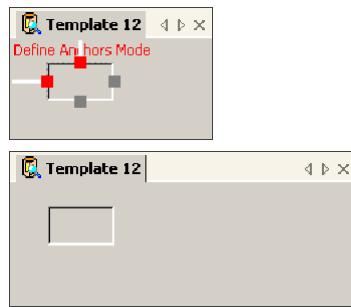
*Figure 56: All control edges with background anchors*

A control anchored from two edges to the background (white anchors) keeps the position of these edges in proportion with the window when the window is resized. The size of the control in [Figure 57](#) remains the same because two edges are not anchored (grey anchors).



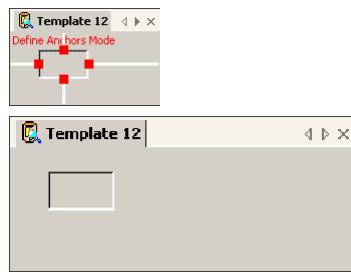
*Figure 57: Two control edges with background anchors*

Fixed (red) anchors maintain the distance from the window edges when the window is resized. The size of the control in [Figure 58](#) remains the same because its other edges are not anchored.



*Figure 58: Two control edges with fixed anchors*

When all edges have fixed anchors, the distances to the window edges remain the same when the window is resized. The size of the control changes accordingly. See [Figure 59](#).



*Figure 59: All control edges with fixed anchors*



Use controls with fixed anchors on all edges with care.

As an example, a small control ([Figure 60 a](#)) is anchored as in [Figure 59](#). If the window size is decreased in the Layout definition mode so much that its width is less than the sum of distances 1 and 2 and its height is less than the sum of distances 3 and 4 in [Figure 59](#), the control cannot be shown ([Figure 60 b](#)). However, if the program is switched to Run mode while the window size is decreased ([Figure 60 c](#)), the system nevertheless tries to show it using the original size and original position and stores the current situation. If the window size is then increased either in the Run mode or in the Layout definition mode, the system keeps the new distances fixed with the result that the size of the control is no more the same as the original size ([Figure 60 d](#)).

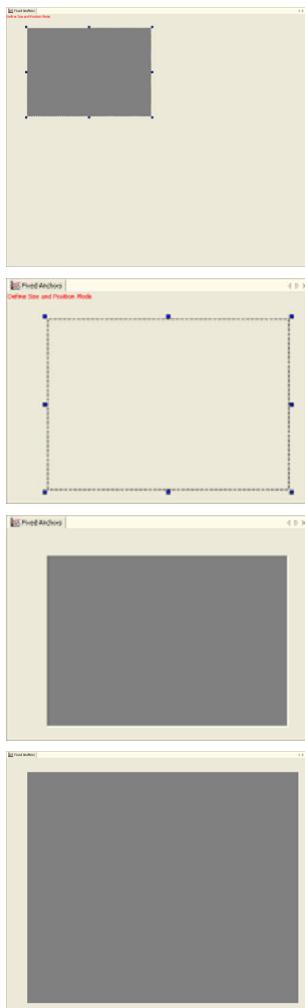
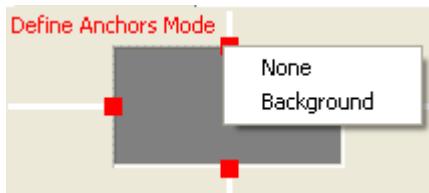


Figure 60: Small control with fixed anchors (a-d)

The controls have default anchors when they are added.

#### 10.3.6.1 To change the anchor types

- Ensure that the program is in the Define size and position mode. For more information on how to get there, see [Section 10.3.6](#).



- To change the anchor type to None or Background, right-click the anchor and click the appropriate command.
- To change the anchor type to Fixed, drag the anchor to the control or window edge to where it should be connected. The white line appears showing the connection.
- After having specified the anchors, check in the Run mode that resizing the window and dragging the splitters behave as planned.

Scroll bars, time bars, history bars, buttons and labels should retain their height, so leave one horizontal edge not anchored (anchor type None).

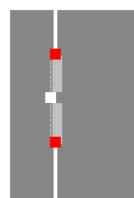
Splitters should retain their positions, horizontal splitters their height and vertical splitters their width. If the Splitters extend over the parent width, default anchoring can be used as follows:

- Horizontal splitters: Top edge is anchored to the background, where the bottom edge remains unanchored. Right and the left side edges are fixed to the parent controls' edges.



*Figure 61: Horizontal Splitter*

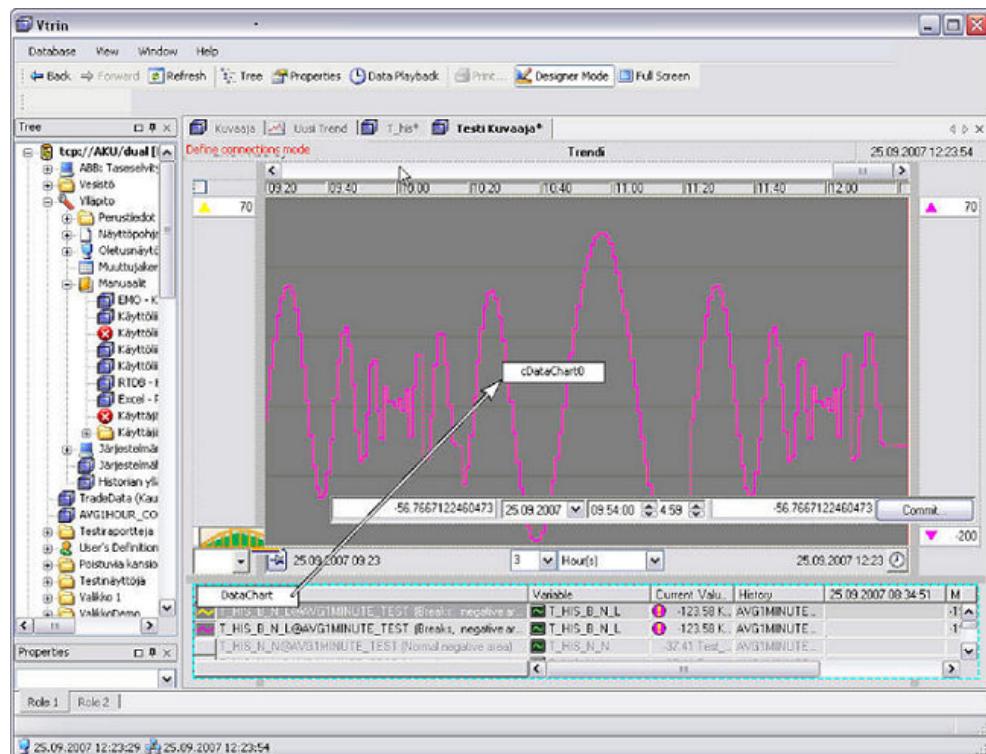
- Vertical splitters: The left side edge is anchored to the background, where the right edge remains unanchored. Top and bottom edges are fixed to the parent controls' edges.



*Figure 62: Vertical Splitter*

### 10.3.7 Connecting Controls

In this phase, a selected control can be connected to other controls. This allows the user to attach data from other controls to the connected control. For example, the legend must be connected with a chart before it can show information on the variables whose graphs are displayed in the chart. See [Figure 63](#).



*Figure 63: Example template with connected controls*

In templates for chart windows, the following controls are usually connected:

- Chart
- Legend
- Ruler
- Scroll bar
- Time bar
- History bar, if exists.

If there are several charts in one template, each chart usually has its own legend, ruler and history bar (if they exist). All charts can share the same scroll bar and the same time bar.

#### 10.3.7.1 To connect a control with other controls

- Ensure that the program is in the Define connections mode. For more information on how to get there, see [Section 10.3.1](#).

#### 10.3.7.2 To select a control to update the connections

- Click the control that will be connected with other (target) control(s). The selected control is now surrounded with a light-blue dashed line and small Connection boxes appear above it. The names in the boxes show the control types that can be connected to the selected control.
- The connection box with grey background is a free connection property.
- When the selected control and the target control are connected, a connection box with a white background and an arrow pointing to a white target box can be seen above another control. The target box shows the name of the target control.



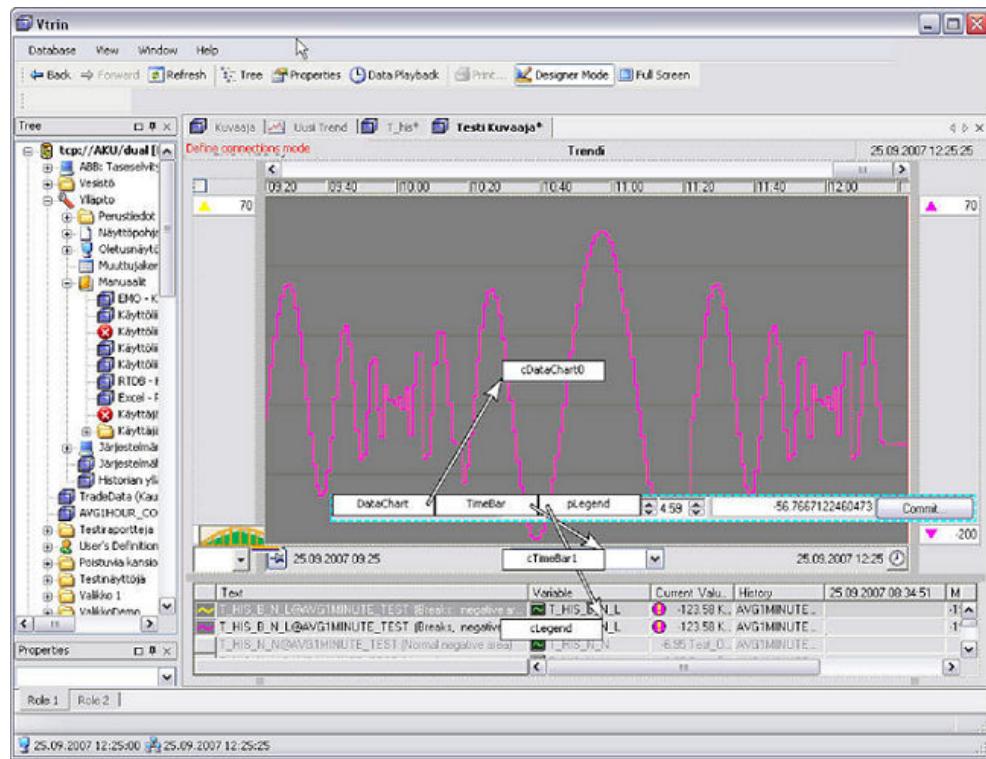
The connection boxes and the target boxes of an inherited control are dimmed. They cannot be modified. See [Section 10.2.1](#).

#### 10.3.7.3 To connect a control

- Connect a selected control with another control in the following way:
  1. Point the selected Connection box with the cursor.
  2. Press down the left mouse button.
  3. Move the cursor over to the target control (which is of the same type as the one shown in the connection box).
  4. Release the mouse button.
- When the connection is successful, the arrow from the connection box points to the white target box above the target control and the target box shows the name of the target control.



The chart connection with the timebar(s) is a special case. The chart can be connected with several timebars. When the chart is connected to the first timebar, a white box pointing to the timebar appears below the connection box and the first timebar property is copied to the first item of the timebar collection. The next free timebar item of the collection is shown as grey connection box, adjacent to the white boxes. See figure below.



#### 10.3.7.4 To disconnect a control

- Disconnect a target control in the following way:
  - Right-click the connection box of the selected control.
  - Select **Remove Connection** from the menu.

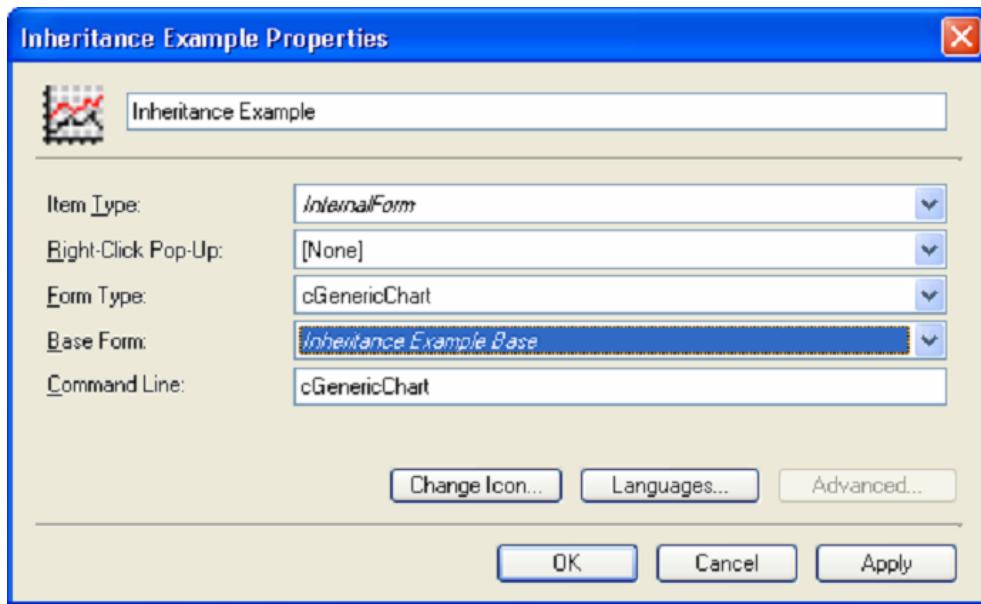
#### 10.3.8 Creating a Template for the Base Template

First, create a folder item in the template folder and then change its type to chart. Make it inherit the base template.

- Right-click the icon or name of the template folder where the new template will be created. Point to **New** and then click **Folder**.

A new folder item appears as the bottommost item with the name New Folder.

- Change the name to a suitable name for the template.
- Right-click the icon or name and then click **Properties**.
- Select InternalForm as the item type and cGenericChart (default) as the form type. Select the name of the base template in box **Base form**. Click **Change Icon** to select a suitable icon for the template.



When the template is opened, the user can see that it has inherited the controls from the base template. It is possible to add new controls and connect variables to charts in the template. When a new chart window is created using the template, these are only copied to the new window, not inherited. If the template control properties and variables that are inherited from the base template are changed, these definitions override inheritance, and changes in the base template are not seen in the template, nor in windows based on this template.

### 10.3.9 Copying Templates and Base Templates

Specify the base template that a template inherits from the **Base form** drop-down list in the **Properties** dialog box of the template. This information is stored internally as a global ID.



If the base template or the base template folder is copied with **Copy** and **Paste**, the global ID of the base template changes. If the template should inherit the copied base template, the user must change the base template specification in the template accordingly. Moving with dragging does not change the global ID.



If the user wants to copy a template to another database, both the template and the base template it inherits must be copied. When doing this, their global IDs change, and the user must specify the base template again for the inheritor template in the new database.

### 10.3.10 Examples of Templates

The following sections provide examples for creating templates for chart windows with one chart as well as a chart windows with two charts.

#### 10.3.10.1 Chart Window with One Chart

The following example illustrates one way of creating a template for chart windows with one chart. If the template is meant for charts with trend plots, the best position for the legend is below the chart ([Figure 64](#)), for charts with columns, to the right of the chart.

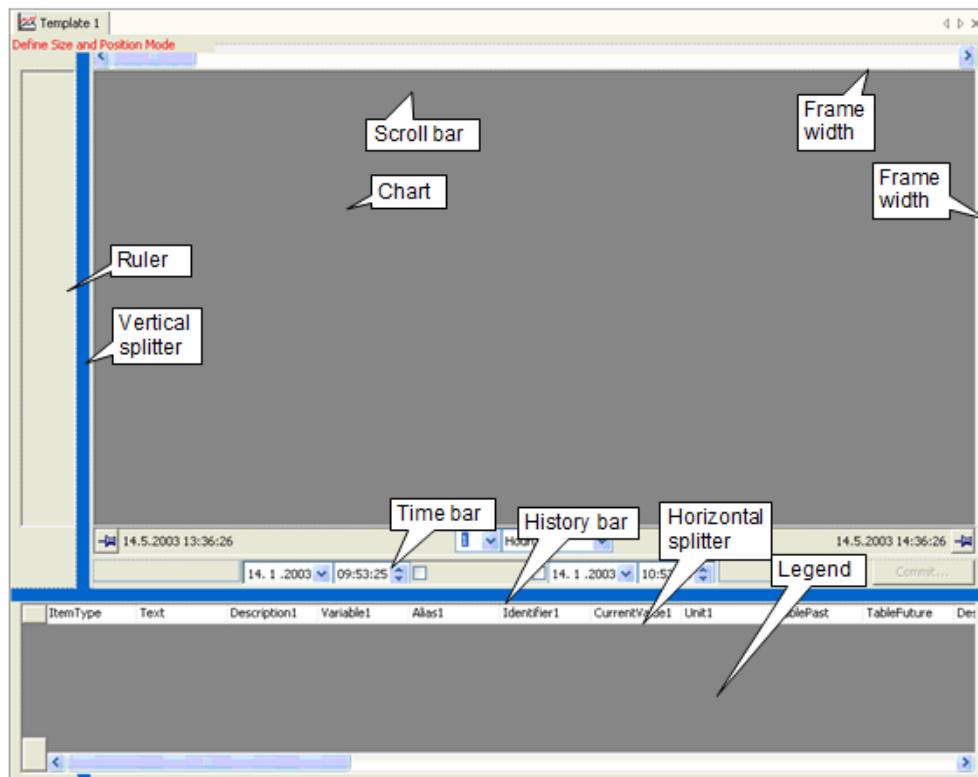


Figure 64: Example template for chart windows with one chart

- Add the following controls:
  - Chart
  - Legend
  - Time bar
  - History bar: Obligatory if the template is meant for chart windows where history updating is allowed. In addition, history bar shows the start and end times when the time span for zooming is selected. However, zooming is possible even without the history bar.
- Position the history bar between the time bar and the horizontal splitter. Make it as wide as the time bar and right align with the time bar.
- Scroll bar
- Ruler
- Horizontal splitter
- Vertical splitter
- Specify the positions and sizes in the Define size and position mode. For example:
  - Resize and position the legend at the bottom so that its distance from the bottom and the edges of the window is the same as the frame width used in the template. Frame width is the empty space left just inside the window edges where no other controls except splitters are drawn (see [Figure 64](#)).
  - Move the horizontal splitter just above the legend and make it as wide as the window.
  - If the history bar is not used:
    - Move the time bar just above the horizontal splitter. Lengthen it so that it is as wide as the chart control should be (i. e. the area where the graphs will be presented).
    - Make the chart and scroll bar of the same width as the time bar.
    - OR
  - If the history bar is used:

- Move the history bar just above the horizontal splitter. Lengthen it so that it is as wide as the chart control should be (i. e. the area where the graphs will be presented).
- Make the time bar, chart and scroll bar of the same width as the history bar.
- Move the time bar above the history bar.
- Move the scroll bar so that its distance from the top of the window is the frame width.
- Move the chart just above the time bar. Adjust its height so that its top reaches the scroll bar.
- Right align the scroll bar, chart, and time bar (and history bar) with the legend.
- Move the vertical splitter to the left of the chart and drag its top to the top of the window. After this, resize the length to the same as the frame height.
- Align the height of the ruler with that of the chart. Align its bottom with that of the chart and its left edge with that of the legend. Drag its right edge to the vertical splitter.
- Define properties for controls as appropriate. See tips for splitters in [Section 10.3.3](#).
- Specify anchors in the Define anchors mode as described in the following table, for example anchor the legend with red anchors to the bottom and edges of the window and the horizontal splitter.

*Table 21:*

Control	Anchor of the left edge	Anchor of the right edge	Anchor of the top edge	Anchor of the bottom edge
Legend	To the window left edge	To the window right edge	To the horizontal splitter	To the window bottom edge
Horizontal splitter	To the window left edge	To the window right edge	Background	None
Time bar	To the vertical splitter	To the window right edge	None	To the horizontal splitter
History bar	To the vertical splitter	To the window right edge	None	To the horizontal splitter
Chart	To the vertical splitter	To the window right edge	To the window top edge	To the horizontal splitter
Scroll bar	To the vertical splitter	To the window right edge	To the window top edge	None
Ruler	To the window left edge	To the vertical splitter	To the window top edge	To the horizontal splitter
Vertical splitter	Background	None	To the window top edge	To the window bottom edge

- Connect the controls, see [Section 10.3.7](#).

### 10.3.10.2 Chart Window with Two Charts

The controls needed depend on how the data will be presented in the chart windows that are created from the template. As an example, let us take a template for chart windows that show

columns in two charts above each other. The legends are placed on the right, as recommended for column charts. Use the following controls:

- Two charts
- Two labels: useful for explanatory titles for the charts
- Two legends
- Time bar (same time bar for both charts)
- Two history bars: obligatory if this template is meant for chart windows where history updating is allowed. In addition, the history bar shows the start and end times when a time span for zooming is selected. However, zooming is possible even without the history bar.
- Scroll bar (same scroll bar for both charts)
- Two rulers
- Horizontal splitter
- Two vertical splitters





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