

# System 800xA Operations

System Version 5.1

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# **System 800xA Operations**

**System Version 5.1**

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# About This User Manual

## General



Any security measures described in this User Manual, for example, for user access, password security, network security, firewalls, virus protection, etc., represent possible steps that a user of an 800xA System may want to consider based on a risk assessment for a particular application and installation. This risk assessment, as well as the proper implementation, configuration, installation, operation, administration, and maintenance of all relevant security related equipment, software, and procedures, are the responsibility of the user of the 800xA System.

The System 800xA is used for monitoring and controlling a process plant. Information in this instruction is intended for the operators of a process plant.

This instruction describes the default settings of an Operator Workplace.

## User Manual Conventions

Microsoft Windows conventions are normally used for the standard presentation of material when entering text, key sequences, prompts, messages, menu items, screen elements, etc.

## Feature Pack

The Feature Pack content (including text, tables, and figures) included in this User Manual is distinguished from the existing content using the following two separators:

## Feature Pack Functionality

<Feature Pack Content>

Feature Pack functionality included in an existing table is indicated using a table footnote (\*):

\*Feature Pack Functionality

Feature Pack functionality in an existing figure is indicated using callouts.

Unless noted, all other information in this User Manual applies to 800xA Systems with or without a Feature Pack installed.

## Warning, Caution, Information, and Tip Icons

This User Manual includes Warning, Caution, and Information where appropriate to point out safety related or other important information. It also includes Tip to point out useful hints to the reader. The corresponding symbols should be interpreted as follows:



Electrical warning icon indicates the presence of a hazard which could result in *electrical shock*.



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



Caution icon indicates important information or 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 pertinent facts and conditions.



Tip icon indicates advice on, for example, how to design your 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, fully comply with all Warning and Caution notices.



## Terminology

A complete and comprehensive list of terms is included in *System 800xA System Guide Functional Description (3BSE038018\*)*. The listing includes terms and definitions that apply to the 800xA System where the usage is different from commonly accepted industry standard definitions and definitions given in standard dictionaries such as Webster's Dictionary of Computer Terms. Terms that uniquely apply to this User Manual are listed in the following table.

## Released User Manuals and Release Notes

A complete list of all User Manuals and Release Notes applicable to System 800xA is provided in *System 800xA Released User Manuals and Release Notes (3BUA000263\*)*.

*System 800xA Released User Manuals and Release Notes (3BUA000263\*)* is updated each time a document is updated or a new document is released. It is in pdf format and is provided in the following ways:

- Included on the documentation media provided with the system and published to ABB SolutionsBank when released as part of a major or minor release, Service Pack, Feature Pack, or System Revision.
- Published to ABB SolutionsBank when a User Manual or Release Note is updated in between any of the release cycles listed in the first bullet.



A product bulletin is published each time *System 800xA Released User Manuals and Release Notes (3BUA000263\*)* is updated and published to ABB SolutionsBank.



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# Section 1 System Overview

The System 800xA is used for process monitoring and control. System 800xA contains the functionality needed for efficient control and supervision of your process.

Key functional areas within System 800xA are:

- Operations
- Batch Management
- Manufacturing Management
- Information Management
- Control and I/O
- Engineering
- Asset Optimization
- Device Management & Fieldbuses

The operator has access to information from all these areas via the Operator Workplace which is the operator's interface to all System 800xA functions. The traditional operator functions like the process graphics, alarm and event lists, trend displays, history logs are available. In addition to this, System 800xA allows the operator to have direct access to documentation, standard operating procedures, drawings etc. depending on how the process application has been configured.

The enabling technique for the above is the Aspect Object technology.

## System Functions - Introduction and Description

### Aspect Objects - Introduction

#### **What is an Aspect Object™**

A plant of today is made up of many real entities, such as pipes, tanks, valves motors etc. In the Aspect Object solution these entities or objects are modeled in the control system. Such a modeled object is called an Aspect Object and can be a simple lowest level object or contain other objects. Objects containing other objects are called composite objects.

The Aspect Object system can also handle computer related objects the same way as real entity objects. Example of such objects are user object, node object, workplace object etc.

#### **What is an Aspect?**

There are a number of different types of information connected to each object. These types of information are called Aspects in the Aspect Object solution. For example a valve may have a mechanical drawing, a faceplate (for control purposes), a graphical representation in a graphical display and so on. Aspect Objects have a number of default aspects for example its name.

Aspect Objects are visualized with different tools like process graphics, alarm lists, Plant Explorer etc. The aspect context menu for an object is displayed by right-clicking on it. This will display a list of present aspects from which a desired aspect can be selected. Depending on the aspect and the environment, the information will be presented on the screen in the appropriate tool.

#### **What is an Aspect View?**

A view is a visual representation of an aspect on the screen. Some aspects have more than one view. One example is Faceplates that can have up to three views. Most aspects also have a configuration view, see *System 800xA, Operations, Operator Workplace Configuration (3BSE030222\*)*.

**How Does it fit Together?**

Figure 1 shows how the concepts fit together. The physical valve is modeled and represented in a graphical display. This valve that is now an Aspect Object, has a number of Aspects, which four are presented here. Each aspect has at least one view.

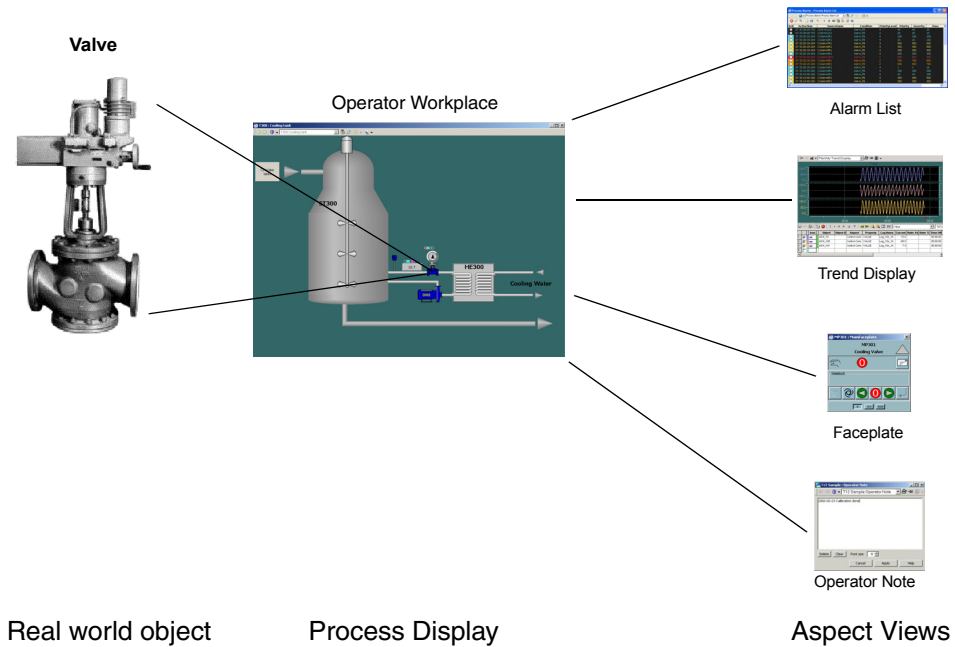


Figure 1. Illustration of an Aspect Object with its Aspects Views



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## Section 2 Start-up

The 800xA system provides the following workplaces to give relevant information to a diverse set of users such as, system engineers, production managers, or plant operators:

- Operator Workplace.
- Plant Explorer Workplace.
- Engineering Workplace.

The Plant Explorer Workplace and the Engineering Workplace are intended for both the System Engineers and Application Engineers. If the Asset Optimization functionality is installed, a Maintenance Workplace is also included. Asset Optimization information can be accessed from any workplace in the 800xA System. The Maintenance Workplace is the default Workplace for a Maintenance personnel. It is basically a Plant Explorer Workplace with an Alarm Band that shows Asset Monitoring Alarms for default Asset groups.

### Open Operator Workplace

To open the workplace for the first time, click **Start > All Programs > ABB Industrial IT 800xA > System > Workplace**.

The operator can subsequently open the workplace by clicking the desktop shortcut.

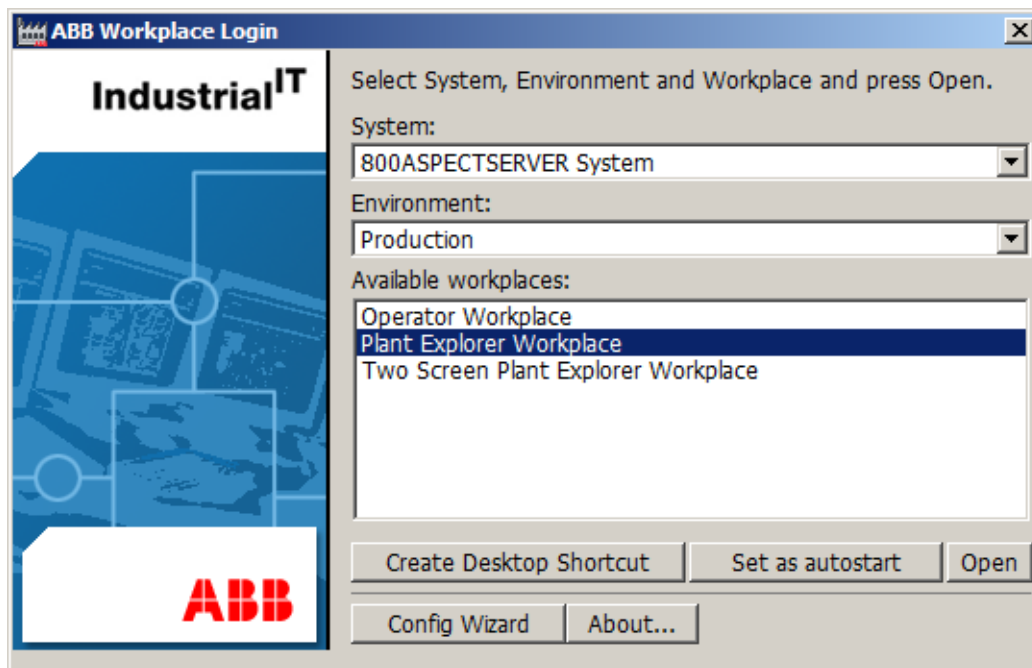


Figure 2. Operator Workplace Log In

Select the workplace and click **Open** or double-click the workplace from the list.

- Click **Create Desktop Shortcut** to create a shortcut on the desktop for the selected workplace.
- Click **Set as autostart** to set the selected workplace to start automatically during system startup.

Two variations of multiple screen workplaces are also available, the Multi-Screen Workplace and the Large Workplace. Refer to [Multiple Screens](#) on page 33.



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## Section 3 Operator Workplace

The Operator Workplace is the environment from which the operator views and control the plant process.

The Operator Workplace may have a single or a multi-screen setup. In the multi-screen setup, one screen can, for instance, be dedicated to always show alarms and another to always present the trend display.

The Operator Workplace comes in two versions; as a full client or as a remote client. The remote client is used for remote supervision and control using the intranet/internet. The remote client only supports one monitor.

The operator keyboard can be a standard PC keyboard with a mouse. It can in addition to the normal keys have dedicated hot keys for fast direct actions.

## Basic Layout

The Operator Workplace Window is divided into four main parts (see [Figure 3](#)), the Application Bar, the Display Bar, the Display Area and the Status Bar, all of which are described in this section.

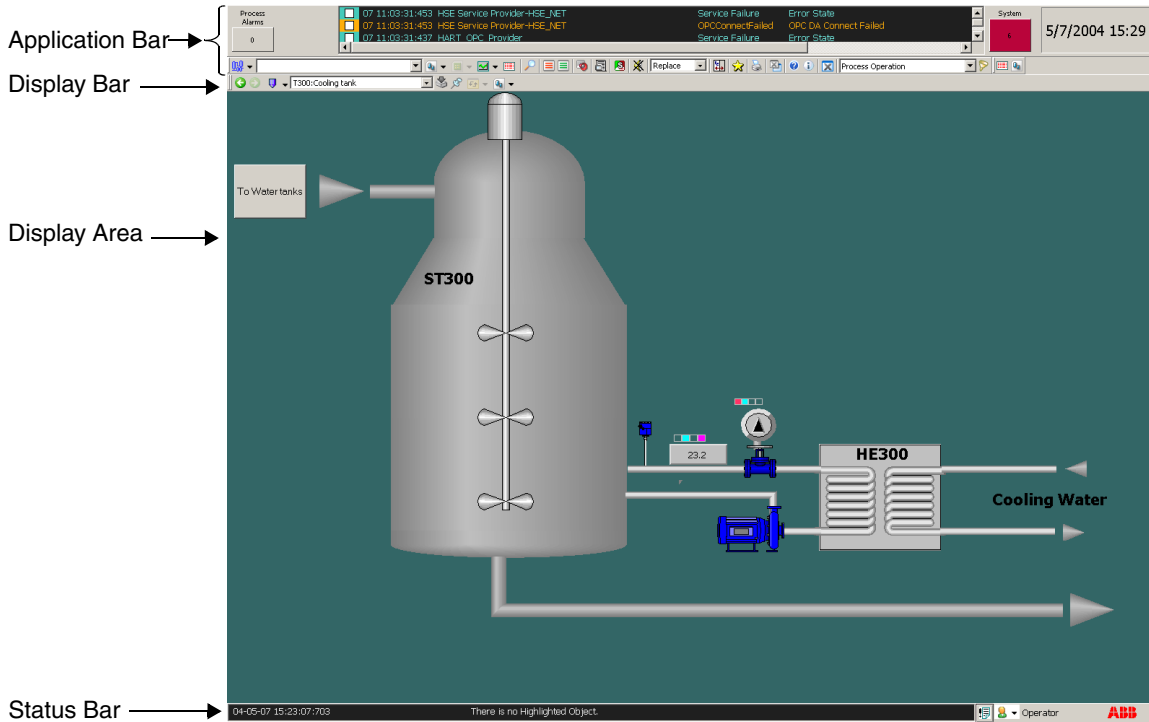


Figure 3. Operator Workplace in Operator Mode

### Application Bar

The Application Bar (refer to [Figure 4](#)) occupies the area at the top of the Operator Workplace window. It is used for showing important information about your system.

The main use is to show the latest alarms, give easy access to the alarm situation for a process area as well as direct links to displays or other aspects and tools.

Note that in Operator Mode it is not possible to cover the Application Bar with other displays that is the Application Bar is a Safe Area.

The different parts of the Application Bar are described below.

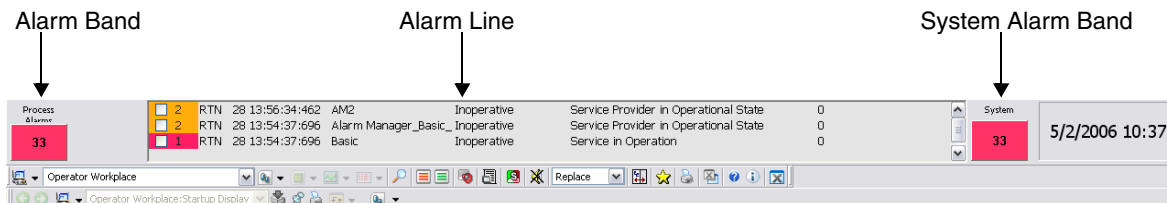


Figure 4. Application Bar

### Alarm Band

The **Alarm Band** provides a summary display for selected alarm lists and provides a link to the corresponding alarm list display. The number on a button (for example 11 for Process Alarms) represents the number of currently unacknowledged alarms. The color of the button shows the highest priority alarm presented at the moment. To go to an alarm list, click on the button. [Figure 5](#) shows an example of an Alarm Band. See [Section 6, Alarms and Events](#) for more information about the alarm band.

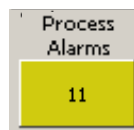


Figure 5. Alarm Band

### Alarm Line

The **Alarm Line** is an Alarm List, with special configuration, that shows the three latest process alarms. [Figure 6](#) shows an example of an Alarm Line.

<input type="checkbox"/>	2	RTN	28 13:56:34:462	AM2	Inoperative	Service Provider in Operational State	0
<input type="checkbox"/>	2	RTN	28 13:54:37:696	Alarm Manager_Basic_	Inoperative	Service Provider in Operational State	0
<input type="checkbox"/>	1	RTN	28 13:54:37:696	Basic	Inoperative	Service in Operation	0

Figure 6. Alarm Line

### System Alarm Band

The **System Alarm Band** provides a summary of the control system alarms. See [Figure 7](#). For more information about system alarms see [System Alarms](#) on page 125.

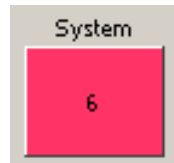


Figure 7. System Alarm Band

### Object Shortcut Tool

The **Object Shortcut Tool** (see [Figure 8](#)) makes it easier to access the most important and/or most frequently used aspects of different aspect objects.

The shortcut icons give direct access to Graphic Display, Faceplate, Trend and Alarm and Event List. At delivery these shortcuts are defined as default shortcuts.

The **Aspect** drop-down menus are organized regarding to aspect category, and give access to related displays for the selected object.

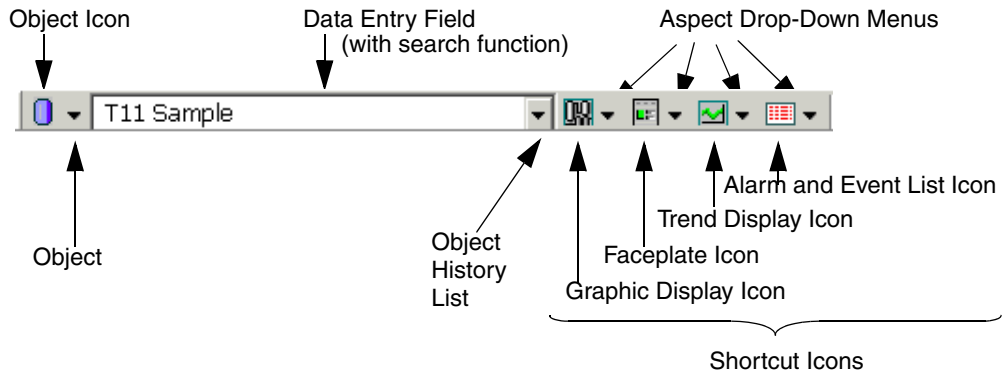


Figure 8. Object Shortcut Tool

Desired aspect for selected object is selected from the **Object Context** drop-down menu or by clicking on the **Object Icon**. See [Figure 9](#).

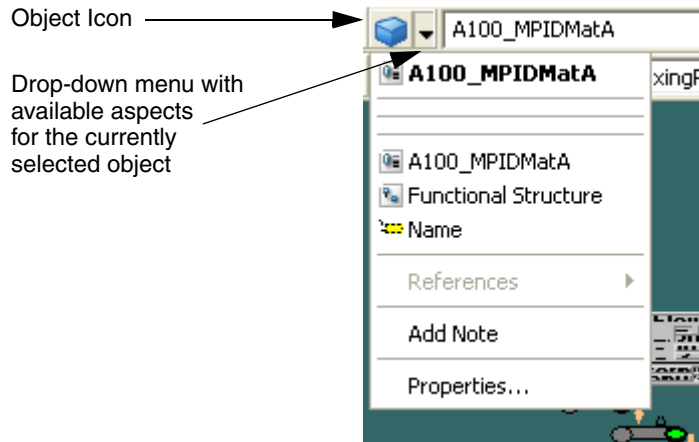
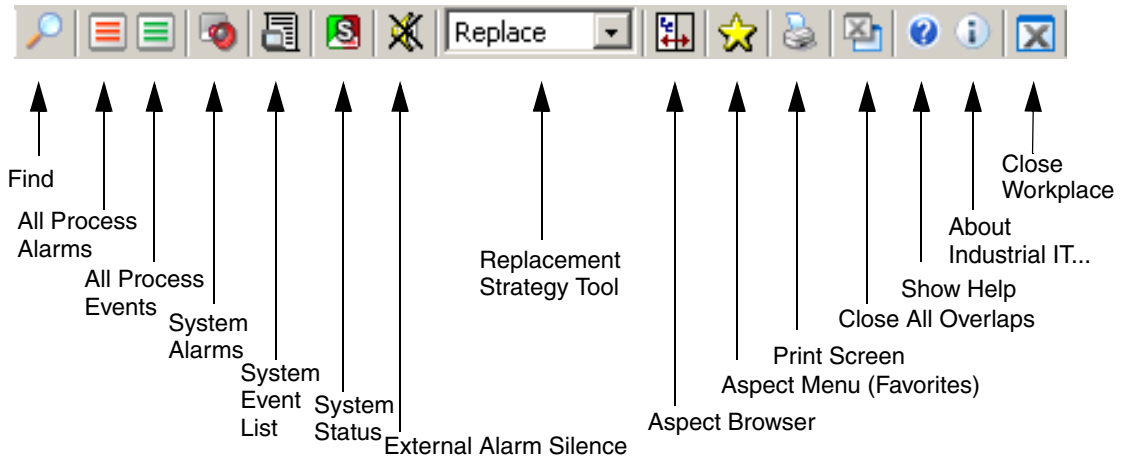


Figure 9. Object Icon

It is also possible to directly type the name of an object in the data entry field.

## Tool Bar

The **Tool Bar** gives you access to different useful tools. See [Figure 10](#).



*Figure 10. The Tool Bar*

- The **Find Tool** is a tool used for finding the objects and aspects in a system, based on name, path or guid and other attributes for example aspect category or creation date.
- **All Process Alarms** shows a listing of all alarms from the process. See also [Process Alarm List](#) on page 103.
- **All Process Events** shows a listing of all events in the process.
- **System Alarms** shows a listing of all alarms in the control system. See [System Alarms](#) on page 125.
- **System Event List** shows a listing of all events in the system.
- **System Status** shows a listing of status information for system services in the Service Structure.
- **External Alarm Silence** is used to silence all external alarms.

- The **Replacement Strategy Tool** allows selection of overlap window behavior. Selection of **Preserve** will cause any selection of aspect to occur in a new overlap window. Selection of **Replace** will cause the overlap window to replace its content if the asked for aspect is of the same type. For further information see [Replace/Preserve](#) on page 35.
- The **Aspect Browser** switches the Aspect Browser on and off. When it is switched on, the Aspect Browser is opened in a overlap window. You can then browse the object structures. The tool has two states - up and down. When the button is down the Aspect Browser is displayed in a separate window. When the button is up, the Aspect Browser is closed. For further information see [Aspect Browser](#) on page 60.
- **Aspect Menu (Favorites)** shows a listing of the aspects that you have chosen to place in the favorites list for fast access. For further information see [Favorites](#) on page 54.
- **Print Screen** is used to print the Operator Workplace contents. The screen where the tool is clicked will be printed on the default printer.
- **Close All Overlaps** will close all overlapping windows (overlap windows) opened in the Operator Workplace.
- **Show Help** shows the On-line Help. See also [On-line Help](#) on page 50.
- **About Industrial IT...** shows information about the installed systems and extensions.
- **Close Workplace** closes the Operator Workplace.

### Filter

With the filter drop-down menu (on the right-hand side of the Tool Bar) you can limit the information in for example an object’s context menu to show only the information that is relevant for you. There are different filters for different users.

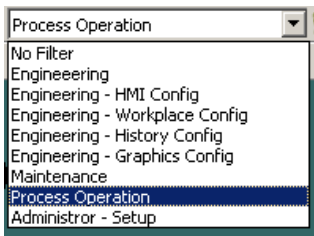


Figure 11. Filter Drop-Down Menu



The tooltips in the Application Bar of the Operator Workplace do not work if the main window of the Workplace is not active.

### Display Bar

The Display Bar, see [Figure 12](#), can be used to control and identify the contents of the Display Area.

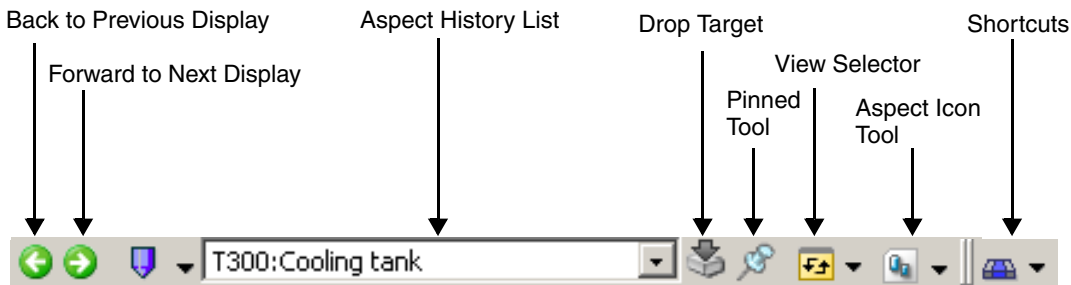


Figure 12. The Display Bar



- By dragging an aspect to the **Drop Target Tool** it will be displayed in the Display Area.
- **Back to Previous Display** shows the previous display in the aspect history list.
- **Forward to Next Display** shows the next displays in the aspect history list.
- **Aspect History List** shows a listing of the most recently viewed aspects or type of information (the latest used display on top).
- By dragging an aspect to the **Drop Target**, it will be displayed in the Display Area.
- The **Pinned Tool** pins the display like a note on a billboard. The display can not be changed by clicking on the Backward or Forward button, or drop a display on the Drop Target tool. To enable change of display, you first have to remove the pinning of the display.
- The **View Selector** shows a drop-down menu of the available views for the aspect you have selected. If you place the pointer on the View Selector, a tooltip will show the current view. This is normally not relevant for operators.
- With the **Aspect Icon Tool** you can for example add the aspect as a favorite by selecting **Add to Aspect Menu** in the drop-down menu. You also have the possibility to display the aspect view on another workplace by selecting the workplace from the **Send To** submenu in the drop-down menu.
- **Shortcuts** provides shortcuts to specific displays. Shortcuts can be added and configured to point out specific displays.

To change the display in the Operator Workplace window, begin by placing the pointer in the main Operator Workplace window or a overlap display, where you want to change display. Click once with the left mouse button. The Title Bar will be high-lighted (marked). Change the display in this selected display area by using one of the ways listed above.

### **Additional Tools in the Display Bar**

A set of additional tools can be available in the Display Bar, if these are configured for your Operator Workplace. See [Figure 13](#).

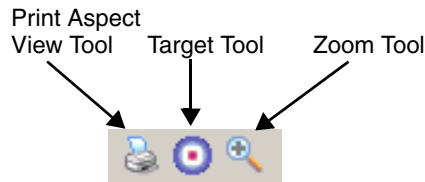


Figure 13. Additional Tools in the Display Bar

- The **Print Aspect View Tool** prints the display area.
- The **Target Tool** makes the display area main target for navigation. The target tool is most commonly used when having a panel with several display areas included or when using multiple screens. If the target tool is pushed/active (see Figure 14), all aspects that can be displayed in the specified display area will be displayed there.

Active Target Tool

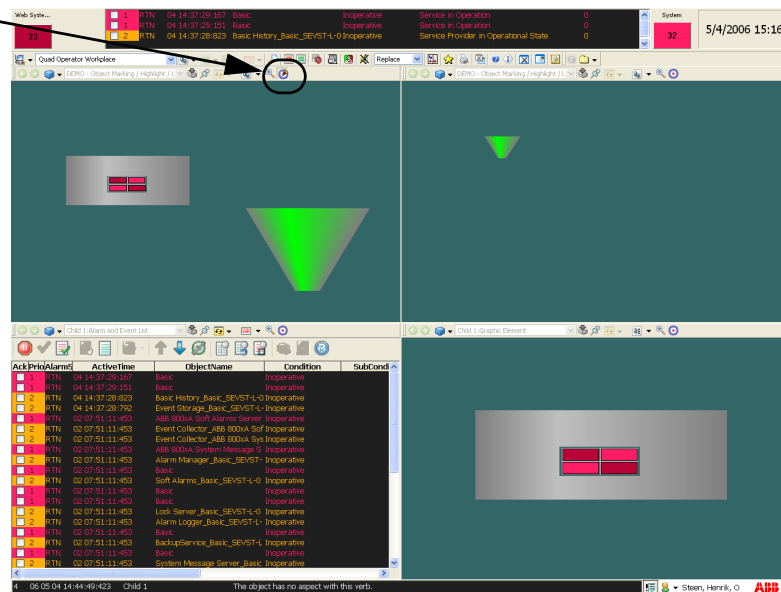


Figure 14. Target Tool

- By using the **Zoom Tool** the display area will be enlarged, see [Figure 15](#). The zoom tool is used when having a panel with several display areas included.

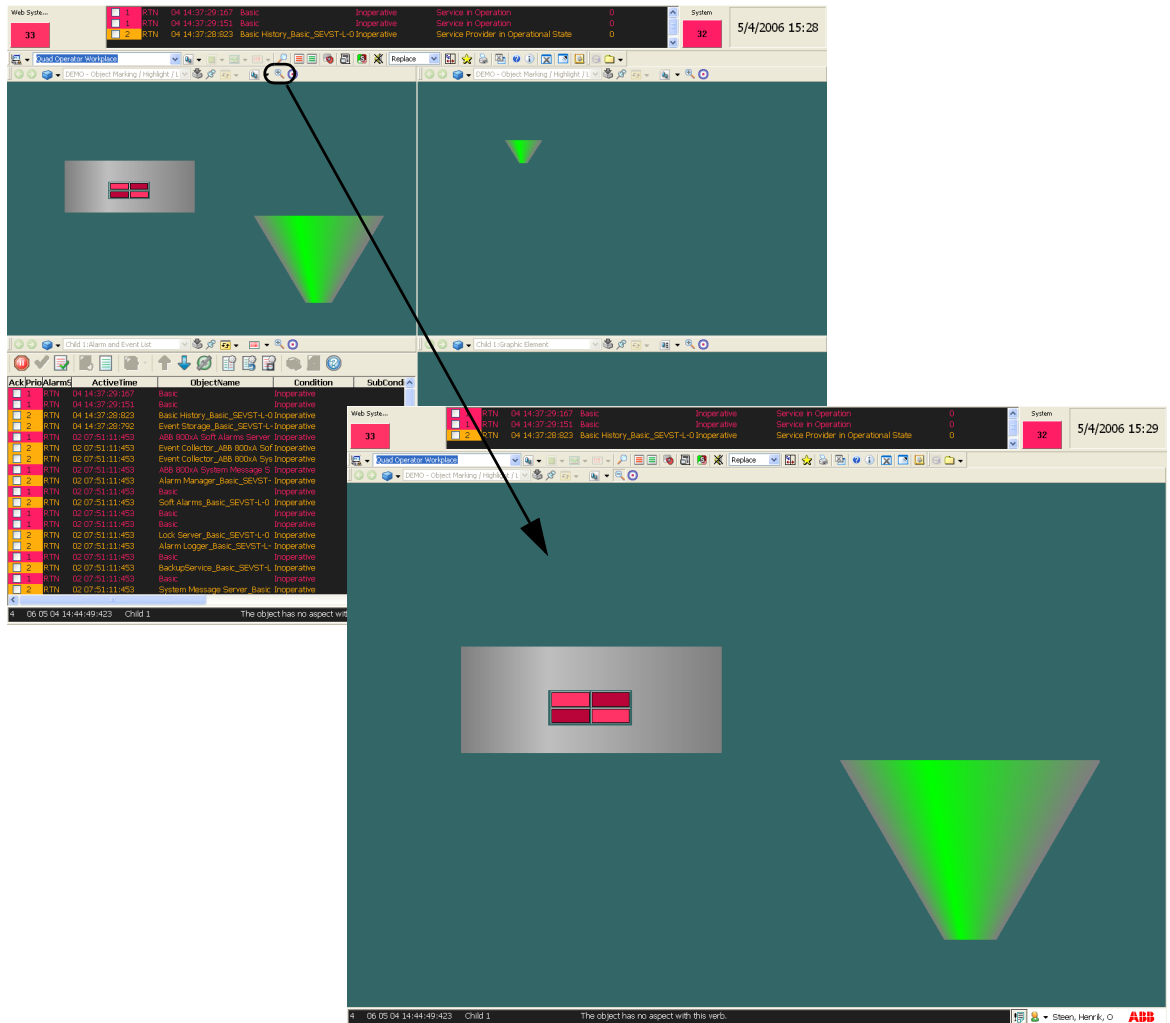


Figure 15. Zoom Tool

## Display Area

This is the main area for the displays. It is used to show a view of an aspect (a display), and the default operator workplace cannot be used to display Trend, alarm and event etc. It is only dedicated for Graphic Displays (You can also present displays as overlap displays). You can use the tools in the Operator Workplace to control and identify the contents of the Display area.

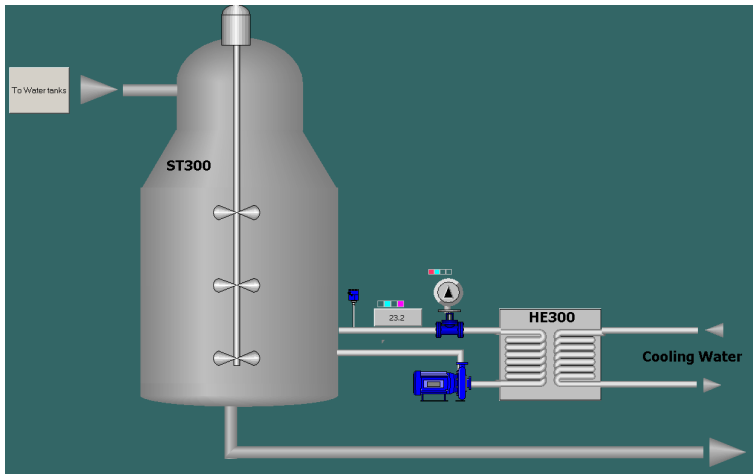


Figure 16. The Display Area

## Status Bar

The Status Bar, see [Figure 17](#), occupies the lower part of the Operator Workplace Window.



Figure 17. The Status Bar

- The **Operator Message Line** shows the latest Operator message from the control system.
- The **Operator Message List** shows a list of all Operator messages from the control system. For information on how to add an Operator Note see [Operator Note](#) on page 81.
- The **Current User Tool** shows who the current user is. Users have different roles and privileges depending on security settings. It is possible to change user, see [Change User](#) on page 35.



In Operator Mode it is not possible to cover the Status Bar with other displays that is the Status Bar is a Safe Area.

## Multiple Screens

Using multiple screens mean that overlaps can be moved from one monitor to another, or be displayed simultaneously on more than one monitor. In System 800xA the monitors can be configured to behave as separate monitors, called Multi-Screen Workplace, or as one monitor, called Large Workplace. The monitors can be configured to stand side-by-side, or be configured on-top of each other.



Overlap windows can not be moved over the Application Bar or the Status Bar when working in Operator Mode, because of Safe Areas.

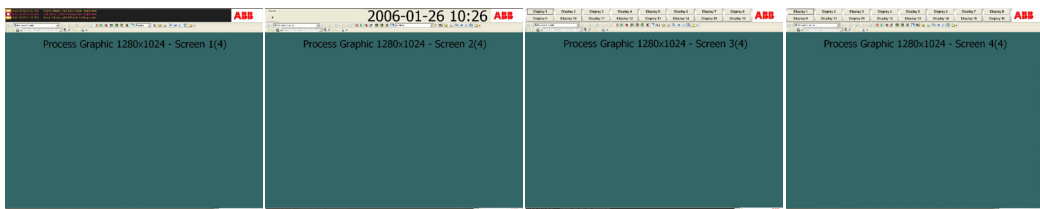


Figure 18. Example of an Operator Workplace 1x4 Side-By-Side Configuration

### How to print when using Multiple Screens

Click the print button on the selected screen that you want to print. For example, if you have a multiple screen environment using 3 screens and you want to print screen #2, click the print button shown on screen #2 and that selected screen will be printed.



Microsoft Visual Basic 6 does not support tooltip functionality in a Workplace with multiple screens. This can cause tooltip for 3rd party ActiveX, created in Microsoft Visual Basic 6, that is embedded in a Graphic Display to show up on the wrong screen.

For more information about multiple screen workplaces, refer to *System 800xA Operations, Operator Workplace Configuration (3BSE030322\*)*.

## Window Management

### Pinning

If you click on the **Pinned Tool** in the Display Bar, see [Figure 19](#), the display area window will be pinned like a note on a billboard. This means that you can not change the content of the display window by clicking on the **Backward** or **Forward** button, or drop a display on the Drop Target tool. To enable change of display, you first have to remove the pinning of the display. To prevent change of the base display you have to pin it, or you can press the **Shift** key when opening an aspect from the context menu, favorites or the aspect browser. This makes the aspect to be presented in a new overlap window.



Figure 19. Pinned Tool

## Replace/Preserve

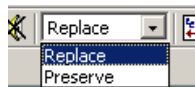


Figure 20. The Replace/Preserve Drop-Down Menu

**Replace** means that when you open a new overlap window, it will replace the oldest unpinned overlap window of the same type.

If you have chosen **Preserve**, new displays are opened in new overlap windows. Sometimes this is not possible, due to the maximum allowed number of windows of **a specific type (view class)**. In this case, the replace strategy will be used instead. That means that the oldest, unpinned window, if any, will be replaced by the new display.

## Change User

When you open an Operator Workplace you get logged in as the current Windows user. Some operations in the system require a change of user. The Change User function enables a fast and temporary switch between users in a running workplace. This can be useful for example, if an operation requires a permission, not held by the current user.



The Change User function is not set by default in the system. Refer to *System 800xA, Administration and Security (3BSE037410\*)* for information about configuring the Change User function.



Change user actions are logged by audit trail.

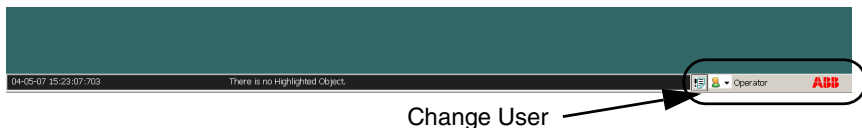
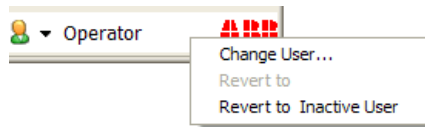


Figure 21. Change User



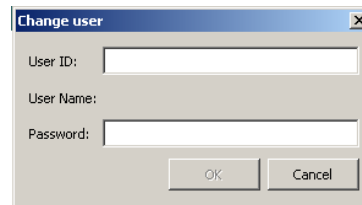
The Change User function only affects the system permission. Windows security is still the same as the user logged in. This means that the access to files is still controlled by the user logged in.

To change user right-click on the user name and select **Change User...**, see [Figure 22](#).



*Figure 22. Change User*

A Change User dialog box appears and the new user has to enter his/her User ID (with domain if it differs from the default domain) and password. See [Figure 23](#).



*Figure 23. Change User Authentication Dialog Box*

If the User ID (with domain if it differs from the default domain) and password are accepted, the dialog box disappears and the new user can operate the workplace. To return to the first user, select **Revert to** in the dialog box, see [Figure 22](#), and enter the previous ID and password.

### Inactive User

Leaving the Operator Workplace, for shorter or longer periods of time, might be considered a threat or security breach in some trades.

As a security precaution it is therefore possible to define an inactivity time-out. When the time-out expires the system automatically reverts to an inactivity user which should be configured to have no or limited permissions.



It is also possible to manually change user to the inactive user by right-clicking on the user name and select **Revert to Inactive User**, for example when leaving the Operator Workplace. Note that no manual authentication is required when reverting to the inactivity user. This is provided that necessary configurations are made in the system. Refer to *System 800xA, Administration and Security (3BSE037410\*)* for information regarding configuration of the inactive user.



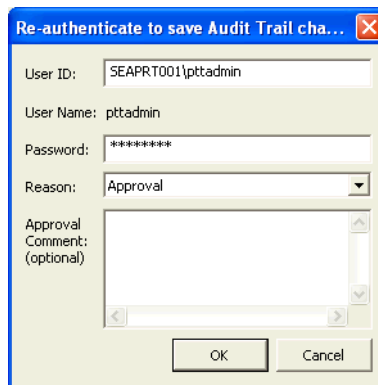
The name **Inactive User** is a configurable name and check with the System Administrator for more information.

The background of the user name has different colors depending on who the current user is. The background is white if the logged in user is active. If a change user action has been made the background is yellow and if the inactive user is the current user the background is grey.

## Approval (Authentication)

Process critical operations sometimes require an approval (re-authentication) in order to perform the operation. The Approval Dialog (see [Figure 24](#)) is asking for authentication from the operator and sometimes also for another approval (double-authentication) from another user with the accurate permission.

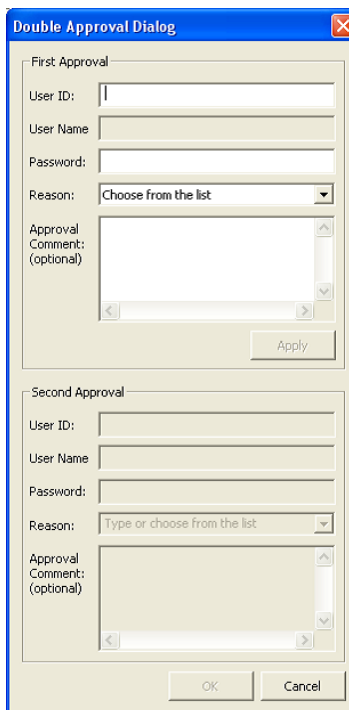
Enter the User ID (with domain if it differs from the default domain) and the password in the **User ID** area. Select a reason from the **Reason** drop-down menu and click **OK**. It is optional to enter a comment in the **Approval Comment** text field.

A screenshot of a Windows-style dialog box titled "Re-authenticate to save Audit Trail cha...". The dialog box contains several input fields: "User ID:" with the text "SEAPRT001\pttadmin", "User Name:" with "pttadmin", "Password:" with "\*\*\*\*\*", and "Reason:" with a dropdown menu showing "Approval". Below these is a text area for "Approval Comment: (optional)". At the bottom are "OK" and "Cancel" buttons.

*Figure 24. Approval Dialog Box*

For double authentication the **Second Approval** area is activated (see [Figure 25](#)).

In the **Second Approval** area another authenticator (which must have Approve permission granted on the object), should enter his User ID and password and reason before pressing **OK**. It is also here optional to enter a comment in the **Approval Comment** text field.



The image shows a 'Double Approval Dialog' window. It is divided into two main sections: 'First Approval' and 'Second Approval'. Each section contains the following fields: 'User ID', 'User Name', 'Password', and 'Reason'. The 'Reason' field in the first section is a dropdown menu with 'Choose from the list' selected. Below the 'Reason' field is a text area for 'Approval Comment: (optional)'. An 'Apply' button is located at the bottom right of the first section. The second section has similar fields, but the 'Reason' dropdown is set to 'Type or choose from the list'. At the bottom of the dialog are 'OK' and 'Cancel' buttons.

Figure 25. Double Authentication Dialog Box

## Point of Control

A plant structure is often divided into logical sections that can be operated individually by a set of designated users. In a distributed system, multiple users operating from different geographical locations can be responsible for different sections of the plant. In such situations, to avoid the risk of more than one user operating a section simultaneously, a strict security can be applied. Setting up a strict security can be challenging and a number of scenarios must be taken into consideration. The feature Point of Control is provided to simplify this process.

Point of Control is a concept that allows dividing the plant into sections. The Operator that is in control over a section is called the Responsible User. The Responsible User has security right granted that other users in the system lack for the same section. A typical scenario is that only the Responsible User will be able to control the process in this section.



The Point of Control feature is not set by default in the system. Refer to *System 800xA, Administration and Security (3BSE037410\*)* for information about configuring this feature.

## Transfer of Responsibility

The Point of Control functionality allows responsibility interaction from any object that belongs to a section based on the following three protocols:

- [Request Responsibility](#).
- [Grab Responsibility](#).
- [Release Responsibility](#).

### Request Responsibility

The responsibility of a section can be requested using the object context menu. When a user requests the responsibility of a section, a tree structure of the section (with all the subsections) is displayed. The user can then select to take the responsibility for the current section and all subsections or specific subsections. The current responsible user can allow or deny the request for responsibility.

The following example demonstrates the Request Responsibility functionality:

1. Select an object that belongs to the section, for example, Area 21.
2. Right-click the object and select **Responsibility > Request...** from the context menu, refer to [Figure 26](#).

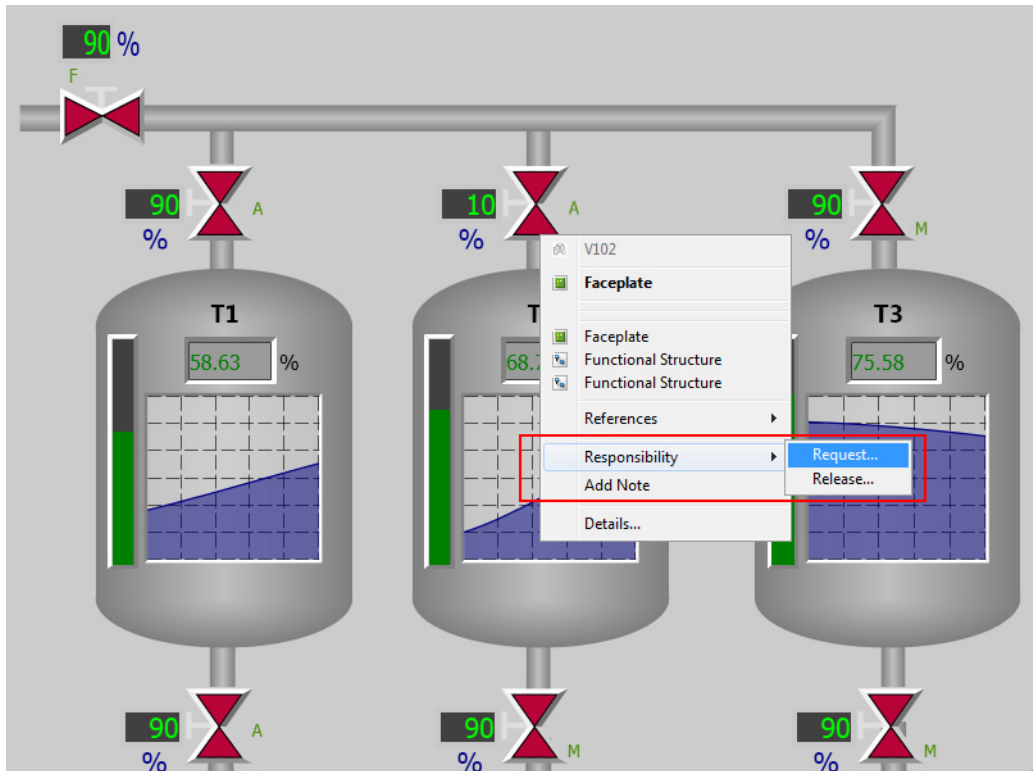


Figure 26. Request Responsibility using Object Context Menu

3. In the Request Responsibility dialog (Figure 27), select responsibility. The Operation responsibility is selected by default.



When requesting a section, the subsections are automatically included.

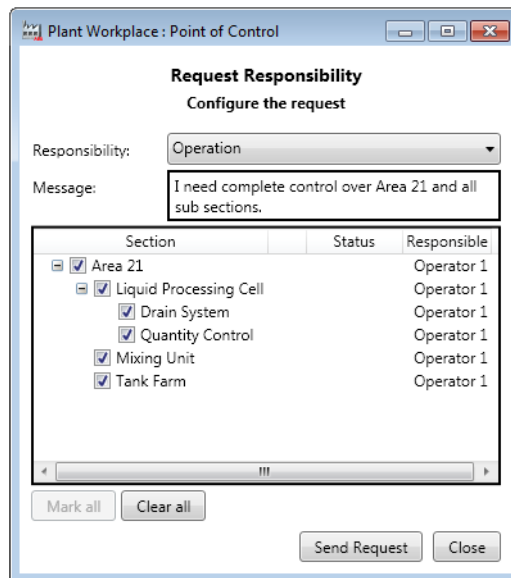


Figure 27. Request Responsibility Dialog

4. Type in an informative message describing the reason for the responsibility request. This message will be shown to the responsible user and stored in the audit list. (Optional).
5. Select the section(s) to take over the responsibility for and click **Send Request**.

After the request for the section is sent, a Handover Responsibility dialog (refer to [Figure 28](#)) is displayed to the current responsible user on the responsible node, if possible with the details of the request.

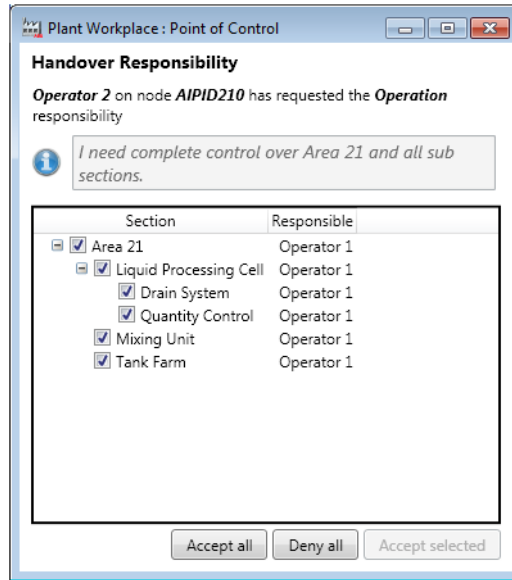


Figure 28. Handover Responsibility

The current responsible user can select to **Accept all**, **Deny all**, or **Accept Selected** sections.

If the responsible user accepts the request, the responsibility is immediately transferred (Figure 29) and a confirmation is sent to the new responsible user (Figure 30).

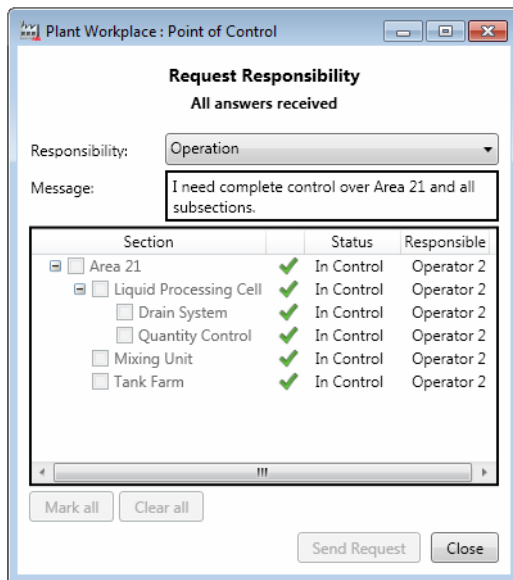


Figure 29. Request Responsibility after the Request is Taken



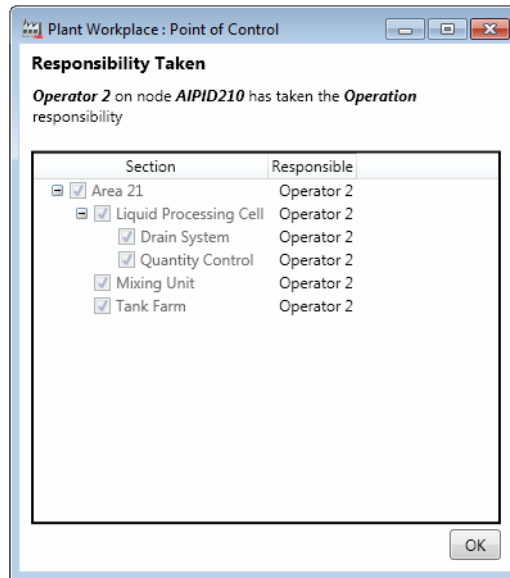


Figure 30. Responsibility Taken Dialog

The [Figure 31](#) shows the Request Responsibility dialog when a request is denied by the current responsible user. The user can submit the request again, if required.

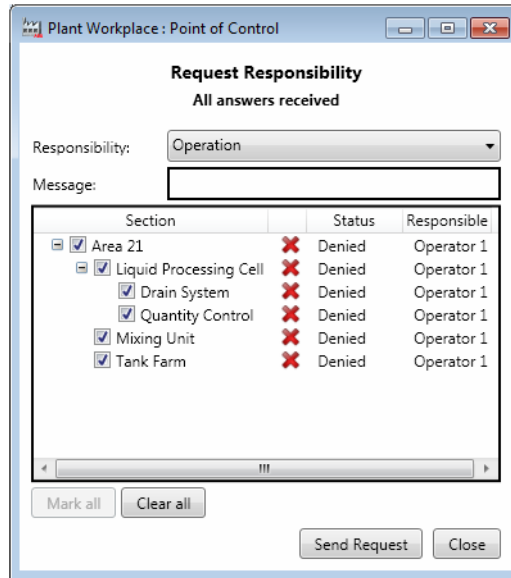


Figure 31. Request Responsibility after the Request is Denied.



It is not possible to request a locked section. Locked sections are indicated by a lock symbol in the Request Responsibility dialog.

### Grab Responsibility

The Grab Responsibility permission is required to take responsibility without waiting for an approval from the current responsible user, for example, in an emergency situation.

To take responsibility of a section using the Grab Responsibility protocol, select the **Force** check box and click the **Force responsibility handover** on the Request Responsibility dialog, refer to [Figure 32](#).

The Force check box is enabled only if the user has the Grab Responsibility permission configured. After the request is sent, a Responsibility Taken dialog is displayed to the previously responsible user that the responsibility of the section has been transferred to the new user.

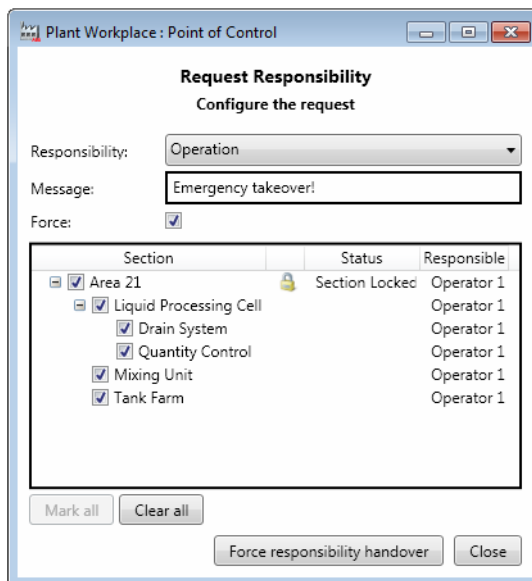


Figure 32. Force Responsibility



A locked section can only be taken with the Grab Responsibility functionality.

### Release Responsibility

The responsibility of a section can be released using the Release Responsibility dialog. To be able to release a section, the user needs to have the Release Responsibility permission configured.

When a user wants to release the responsibility of a section, a tree structure of the section is displayed. The user can select which sections to release the responsibility for and click **Release** on the Release Responsibility dialog, refer to [Figure 33](#).

Responsibility of a subsection cannot be released if the user is responsible for the parent section.

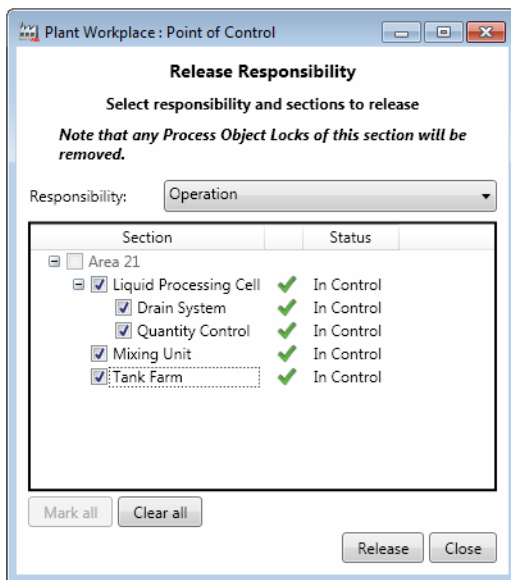


Figure 33. Release Responsibility Dialog

## Point of Control Summary Aspect

The Point of Control summary aspect shows the responsibility status of all configured sections.

If the **Filtered mode** check box is selected (Figure 34), only sections below the current object are displayed.

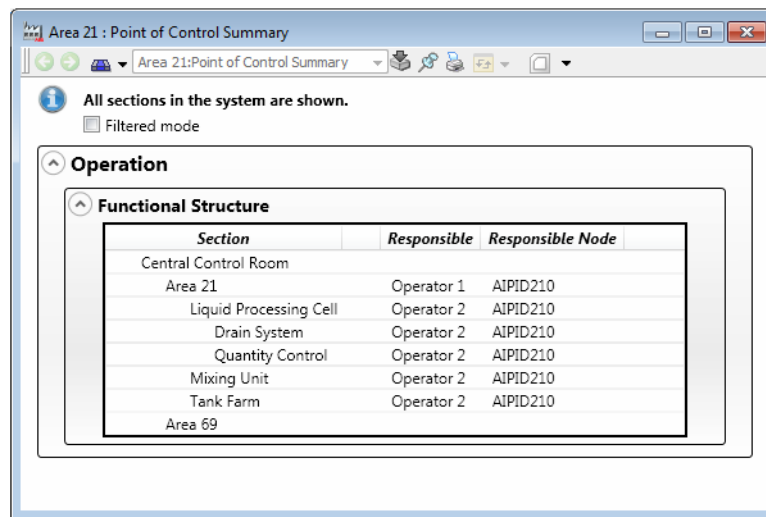


Figure 34. Point of Control Summary

## Confirmed Write

When running a SIL classified application in an 800xA for AC 800M High Integrity Controller the Confirmed Write dialog box pops up. This is to ensure that the required configuration parameter change or process value change is confirmed.

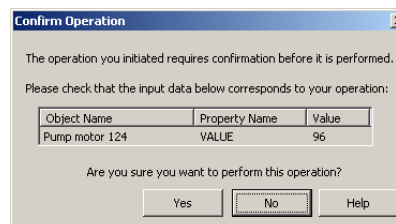


Figure 35. Confirmed Write Dialog Box

The dialog box displays the related object name, the name of the accessed property and the value to be set. Ensure that the data in the dialog box corresponds to the values given in the operation. If it does press **Yes** if not press **No**.

## On-line Help

If you want help meanwhile running the Operator Workplace you can press the **Show Help** button, refer to [Figure 36](#). When the on-line help is displayed you also have access to all on-line help documentation.



*Figure 36. Help Button*

# Section 4 Navigation

## Overview

System 800xA offers a vast variety of navigation possibilities. Some examples are filters, hot keys, aspect links and favorites.

For example, filters are used for displaying relevant information for you as an operator. Aspect links are links in the graphic display which you can use to navigate forward and backward within the process. You can also use hot keys to gain direct access to process area displays, or to perform an action on an object.

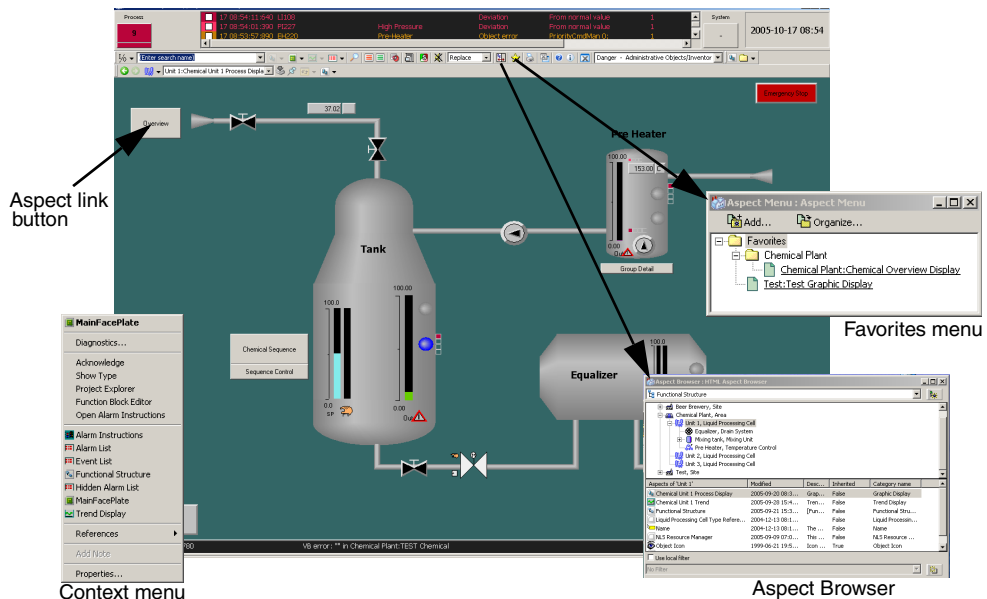


Figure 37. Example of an Operator Workplace

## Display Switching

There are different ways of navigation in the Operator Workplace. Below are described ways for fast access to aspect objects. See [Figure 38](#).

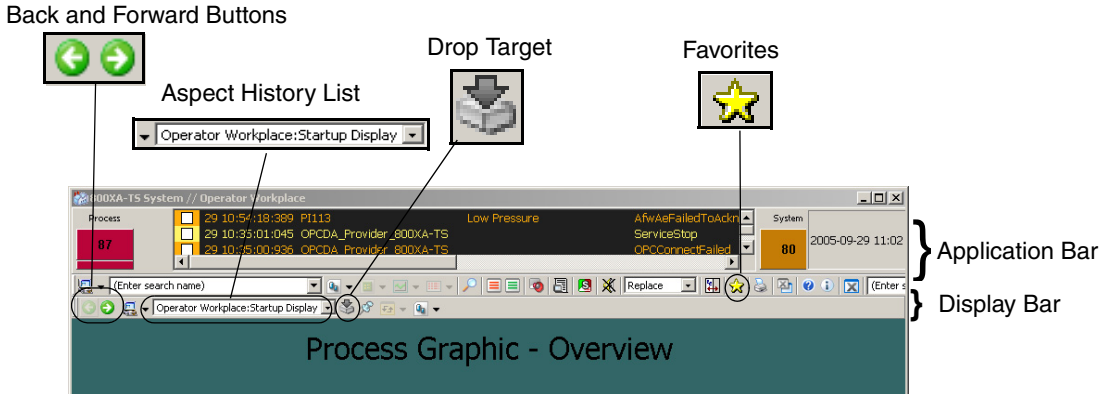


Figure 38. Display Switching

- Back and forward buttons**

You can move back to the previous display by clicking on the Back to Previous Display button. You can move forward to the next display by clicking on the Forward to Next Display button.
- Aspect History List**

Select the Aspect History list to get the most recently viewed aspects (the latest displayed on top). The list contains both the object and its aspects.
- Drop Target**

You can view an aspect by dragging it (from e.g. the aspect browser) to the Drop Target area.
- Favorites**

Use the Aspect Menu tool to group and organize the most visited aspects for fast navigation to them.



## Shortcuts

Shortcuts make it easy to navigate to the most important and/or most frequently used aspects of different aspect objects. You use shortcuts for one-click access to a specific display. The display is an aspect of an aspect object. The icon representing the shortcut is the aspect object icon.

You can find different shortcuts in the Application Bar (see [Application Bar](#) on page 22). Shortcuts to Graphic Displays, Faceplates, Trend Displays, Alarm and Event Lists are default and included as aspect drop-down menus in the Object Shortcut Tool. If, for example, an aspect object without any Graphic Display aspect is selected, this drop-down menu will be disabled. See [Figure 39](#).

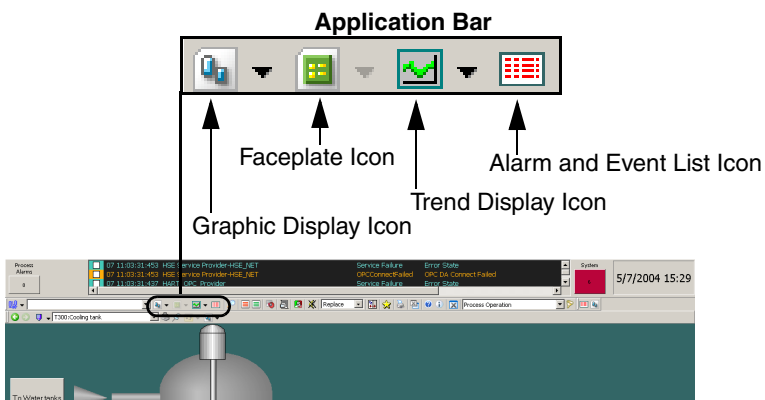


Figure 39. Default Shortcuts

You can have shortcuts in the Display Bar for fast navigation to pre-configured displays.

Finally, the Aspect List (drop-down menu), available if you click on the **small list symbol** beside the Display Shortcut icon, presents a list of the other aspects of the specified aspect object. Click on the wanted aspect name and the corresponding aspect view will be displayed.



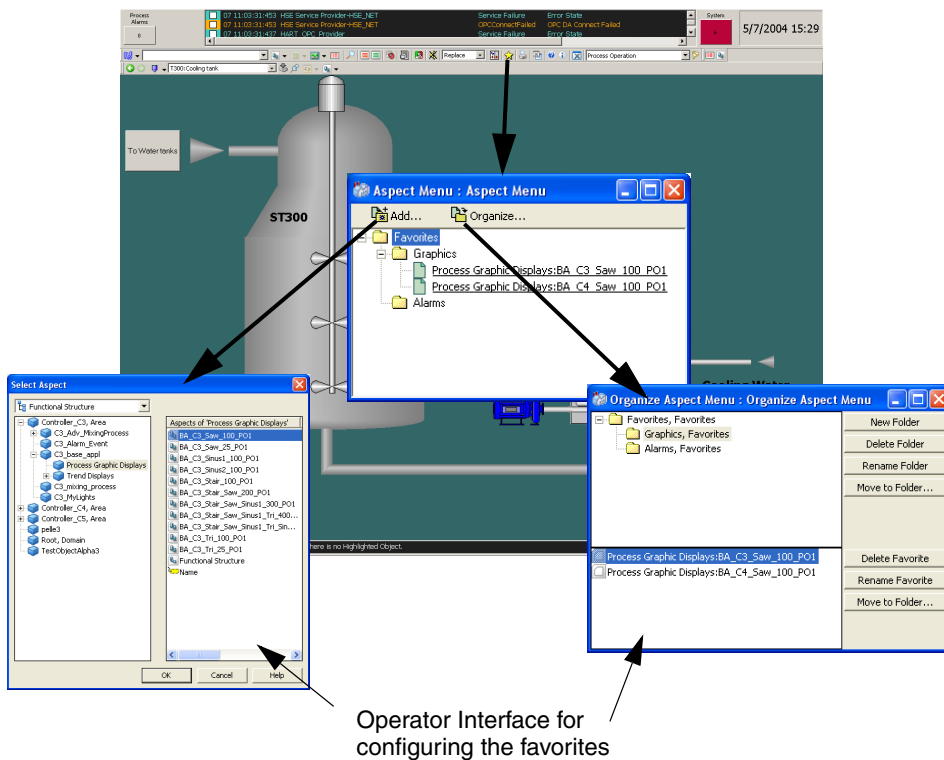
When the pointer is placed on top of a shortcut, the tooltip displays the aspect object name and the aspect.

### Favorites

The easiest way to configure favorites is to open the aspect and click the Aspect Icon Tool in the Display Bar and select **Add To Aspect Menu**.

Another way to configure favorites is to follow the steps show in [Figure 40](#).

Use the Aspect Menu tool to group and organize the most visited aspects for fast navigation to them. The Aspect Favorites can be accessed from the Tool Bar by clicking on the Aspect Menu icon.



Operator Interface for configuring the favorites

Figure 40. Working with Favorites

The Aspect Menu tool gives you possibility to add, delete, copy, paste and rearrange the Aspect Favorites by using the **Add** and **Organize** buttons. It is also possible to add aspects to the user's Aspects Favorites using the aspect context menu.



Aspect Favorites can be defined per user and per user group. Favorites defined per user group can only be changed using the Plant Explorer or a similar tool. The modifications a user makes, using the favorites function, will only be applied to the user's Aspect Favorites. For more information see *System 800xA, Operations, Operator Workplace Configuration (3BSE030222\*)*.

## Hot Keys

Some actions can be defined and executed via the Hot Key support in the 800xA System.

A Hot Key is a specific predefined key combination (or a single key) that performs a specific function. For example, opening a overlap window etc.

A hot key operates on the highlighted process object or globally. The default behavior is highlight follows faceplate focus, which means that the hot key operation will be executed on the object represented by the faceplate in focus.

[Table 1](#) shows available predefined Hot Keys in the Operator Workplace.

*Table 1. Workplace Hot Keys*

Hot Key	Operation
ALT+HOME	Show Pointer
CTRL+F	Find tool
CTRL+SHIFT+3	All process alarms
CTRL+SHIFT+4	All process events
CTRL+SHIFT+5	System alarms
CTRL+SHIFT+6	System events
CTRL+SHIFT+7	System status
CTRL+SHIFT+S	Direct external alarm silence

Table 1. Workplace Hot Keys (Continued)

Hot Key	Operation
CTRL+ALT+F4	Close all overlaps
ALT+F4	Close Active Window
F1	Context Sensitive Help
CTRL+SHIFT+F1	Show hot key map

## Process Object Navigation

The Operator Workplace provides the following ways for fast access to objects and the information they hold in aspects:

- The **Object Shortcut Tool** enables direct search as well as navigation to previously visited aspects of different objects.
- The **Aspect Link** in the Graphic Display is a shortcut to another aspect.
- The **Aspect Browser** provides the possibility to search for objects and their aspects by browsing structures.

- The **Context Menu**, reached through your right mouse button, always gives you direct access to aspects of an object.

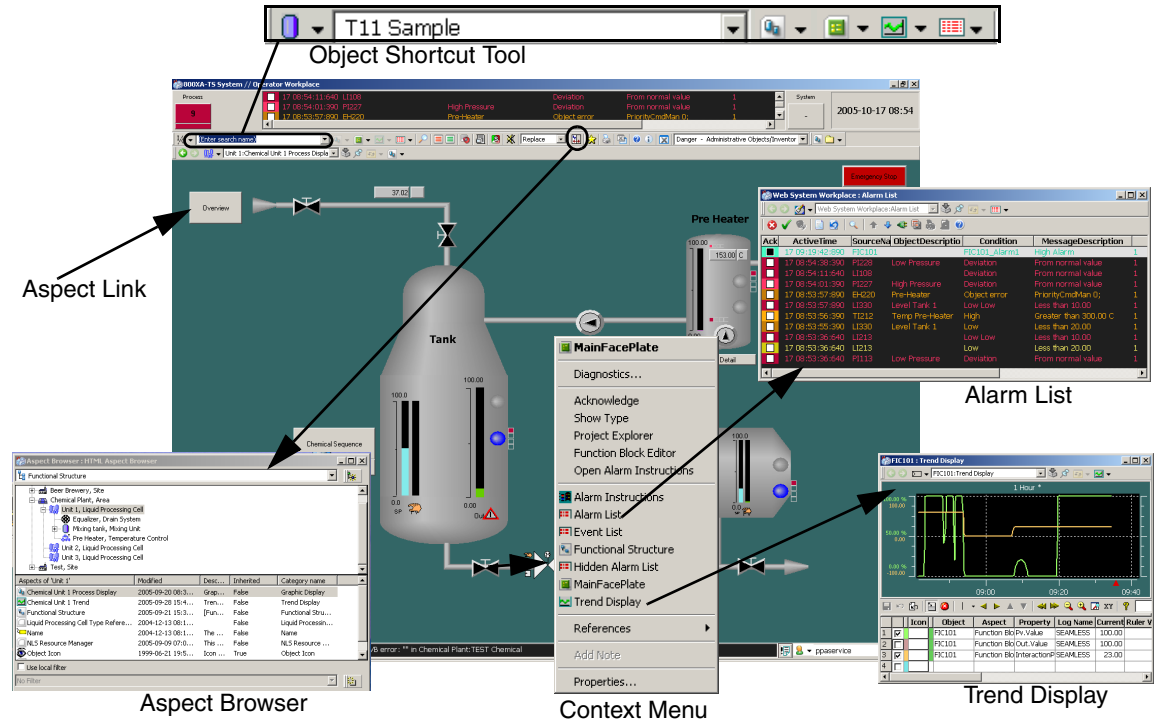


Figure 41. Ways to Navigate

## Context Menu

Right-click on an object to bring up the context menu. You can e.g. select an aspect, action or a referenced display for the object from the context menu.

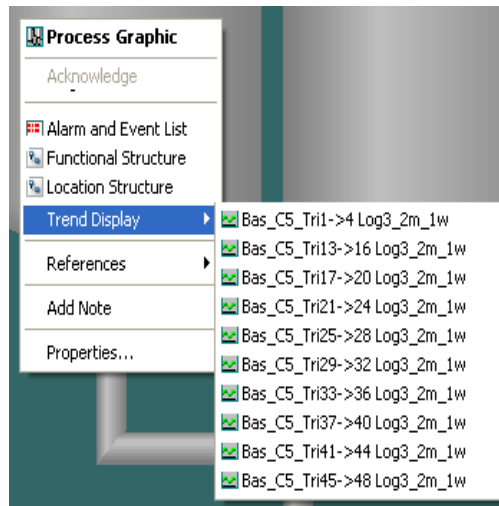
The contents of the context menu may differ depending on which object you have selected. The contents may also differ depending on which filter that is active. For example, the aspects of different objects differ, but the aspects of a specific object are always the same no matter where in the workplace you right-click.

Here are some common examples from where you can access the context menu for an object:

- On an object in a graphic display.
- On an alarm line in an alarm list.
- On a configured row in a trend display.

The object context menu is also available as a drop-down menu by clicking on the arrow to the right of the object icon presented in the Display Bar, object shortcut tool and in shortcuts.

All aspects that belongs to the same category may be grouped in a separate submenu, see [Figure 42](#).



*Figure 42. Grouped Submenu in the Context Menu*

The different parts of the object context menu are as follows, see [Figure 42](#):

- The **Object Name** (always the top entry of the list).
- The **Default Aspect** gives the default aspect for the currently selected object.
- The **Aspect List** is a list of all viewable aspects connected to the object which are not filtered away by the active aspect filter. A graphic display, alarm list or a trend display are examples of aspects.
- **References** contains a list of graphic displays the object has references to.

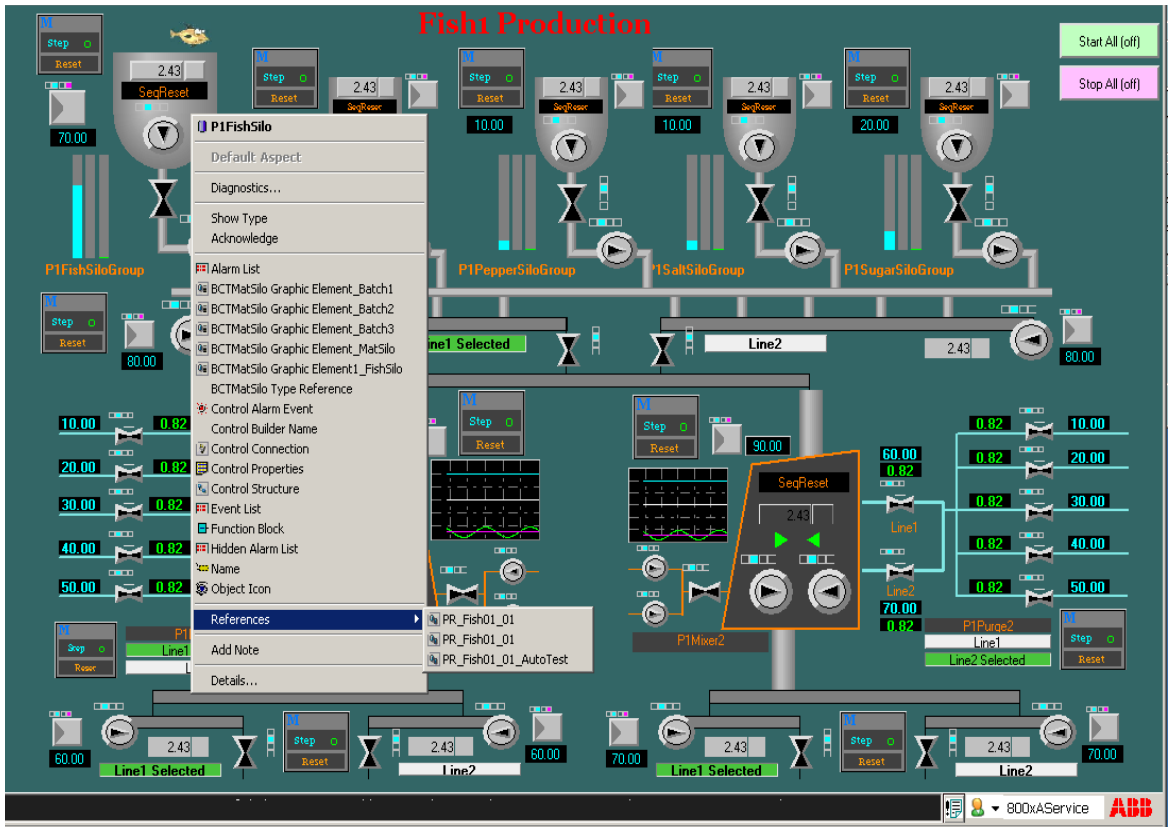



Figure 43. Different parts of the Object Context Menu

### Aspect Browser

By clicking on the **Aspect Browser** button  , you switch the Aspect Browser on and off. When switched on, the Aspect Browser is opened in a overlap window. You can then browse the object structures. To view an aspect, select an aspect from the structure drop-down list and click the selected aspect in the aspect list area, see [Figure 44](#).

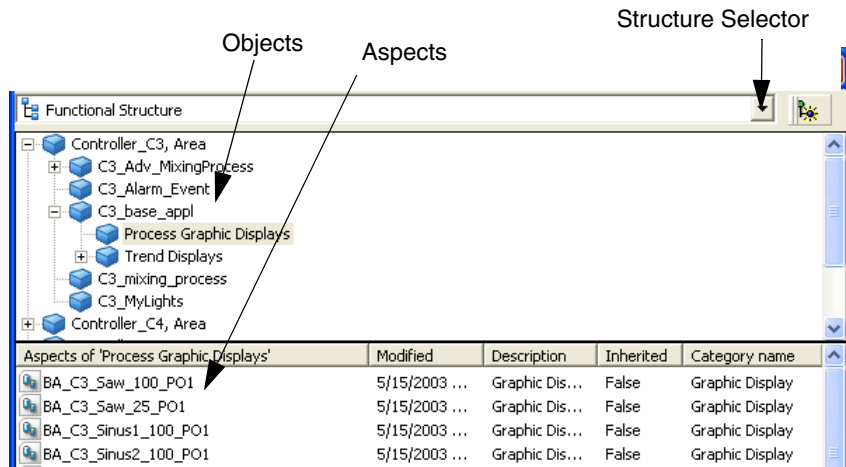


Figure 44. The Aspect Browser



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# Section 5 Process Graphics

## Overview



A new enhanced graphics package, *Process Graphics*, is introduced and is described in this section.

Process Graphics and the Visual Basic based Process Graphics (VBPG) can co-exist in parallel in the same system. For more information about VBPG, refer to [Appendix C, VB Process Graphics](#).

Process Graphics is used to show displays of an area of the plant. Graphic displays are built from static and dynamic graphic elements. Static elements represent background information like pipes or conveyer belts and so on and do not normally change. Dynamic elements represent process objects and are used to present information from the process or to perform actions on the process.

A dynamic graphic element is highlighted when the pointer is placed on it, refer to [Figure 45](#). A tooltip shows the name of the object represented by the element. Right-click the object to view the context menu. Left-click the object to view the default aspect in the context menu. Typically the default aspect is a faceplate.

If a dynamic graphic element supports object locking, it is surrounded by a white frame (refer to [Figure 56](#)) when the object is locked by a user, refer to [Header](#) on page 75 for more information. The context menu for an aspect object may include trend or alarm displays etc. for the object. Refer to [Context Menu](#) on page 57 for more information.

A faceplate is used by the operator to view the status of an aspect object (for example, a process I/O) or to interact with it, refer to [Faceplates](#) on page 71. Aspect view buttons are dynamic graphic elements that are used to invoke other Process Graphics displays.

Process Graphics are displayed in the display area of the Operator Workplace on the screen. It may be displayed as a basic display covering the entire display area or as a pop-up display. As a summary, with Process Graphics the operator can:

- Supervise the process.
- Highlight dynamic elements by placing the pointer on them.
- Control the process through faceplates.
- Change display to another graphic display or alarm or trend display through Aspect view buttons.
- Display alarm or trend displays through context menus for the objects.
- Acknowledge alarms through the display bar or context menu.

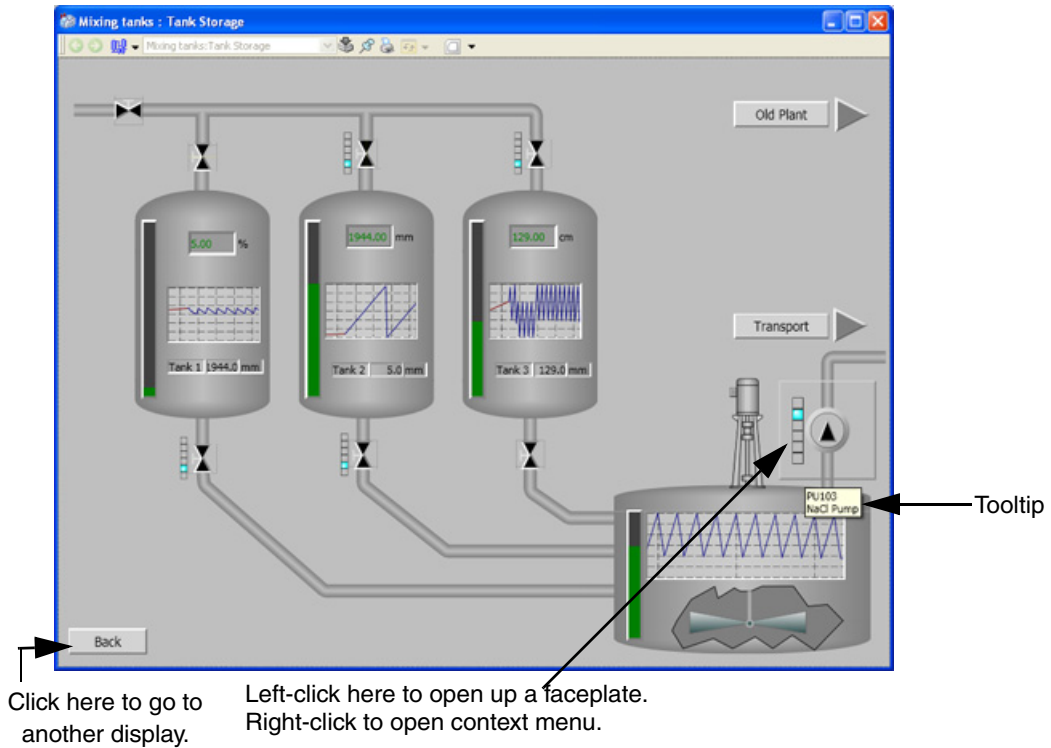


Figure 45. Process Display


## Acknowledging Alarms in a Graphic Aspect

This section describes the procedure to acknowledge alarms in a graphic aspect. In the System 800xA, alarms are acknowledged by using the alarm list or by using the Alarm Control button available in the faceplate. Alarms in a graphic aspect can also be acknowledged using a single command. The command acknowledges alarms for all visible objects in the graphic aspect. Any alarms for the objects through which faceplates can be opened, are acknowledged.



If a graphic display contains only primitive items that are configured to aspect object properties through expressions, then only the alarms for the object where the graphic display is located will be acknowledged.

Following are the two methods to acknowledge alarms in a graphic aspect using a single command:

1. Click the  icon on the display bar of the graphic aspect preview as shown in [Figure 46](#).

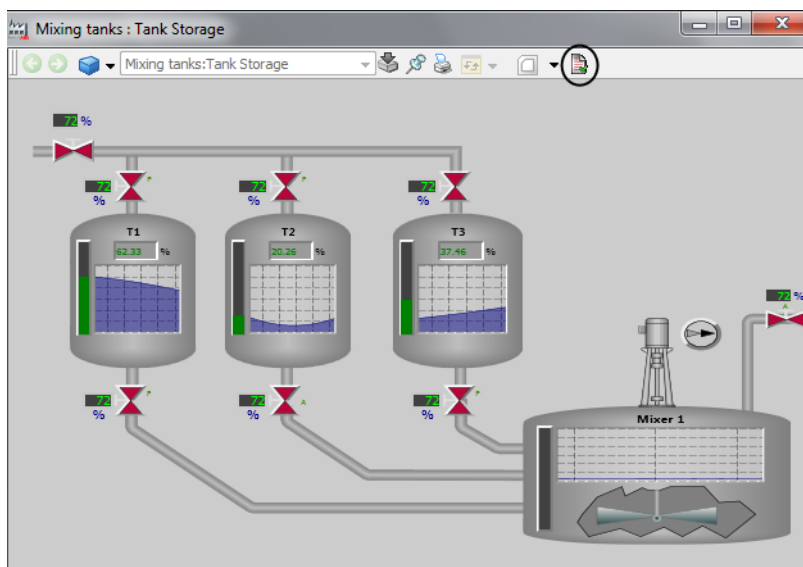


Figure 46. Display bar of a graphic aspect

2. Right-click the preview area of the graphic aspect and select **Acknowledge All Visible Alarms** from the context menu as shown in [Figure 47](#).

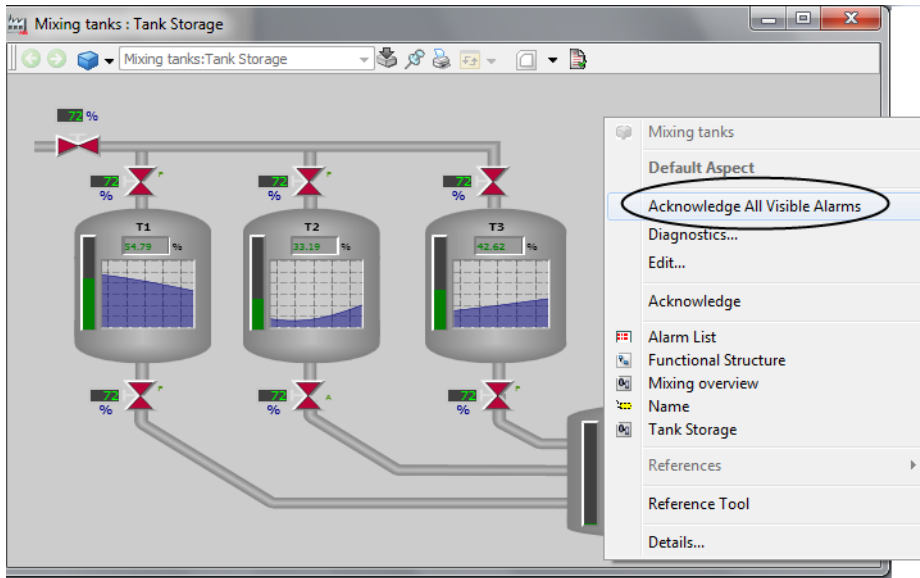


Figure 47. Context menu of a graphic aspect

## Graphics Elements

Graphics elements are dynamic graphic elements that represent real process objects, such as a motor or a valve, see [Figure 48](#).



*Figure 48. Example of a Display Element for a Motor*

In the center of the element there is a representation of the relevant process object. This is usually a symbol representing the object, for example a symbol of a valve, motor, or tank. There may also be text.

The symbols in the corners show object alarms, object mode, object status and other information about the object, for example if there are any Operator Notes for the object. See [Table 2](#).

If there is more than one alarm for the object, then only the most severe alarm state will be shown.

## Symbols in Graphics Elements

The table below shows some examples of symbols that appears in Graphics elements and faceplates. For more symbols, see [Appendix D, Icons and Symbols](#).

*Table 2. Symbols in Graphics elements*












Appearance	Description
	<p>There are Operator Notes for the object. See <a href="#">Operator Note</a> on page 81.</p>
	<p>Object is run automatically by the system.</p>
	<p>Object is controlled manually.</p>
	<p>Object is interlocked. Interlocks are used to lock out a process object from certain states during a time period. For example, a motor can either run or be stopped. If the motor cannot be run due to repairs, then the motor is interlocked and can not be started.</p>
	<p>Off The object is turned off.</p>

Table 2. Symbols in Graphics elements (Continued)

Appearance	Description
	<p>On The object is turned on.</p>
	<p>Status information box. The Status Information box. Position 1 - Alarm State (Red) A flashing light indicates an unacknowledged alarm. Position 2 - Manual Mode (Aqua) Position 3 - Forced Mode (Yellow) Position 4 - Local/internal Mode (Magenta) Position 5 - Action Mode (Blue) Position 6 - Disabled/inhibited mode (Orange) For example, Position 4 can be used to indicate Local mode for a motor and Internal mode for a regulator.</p>

Graphics elements can show controller communication status, see [Table 3](#), on top of themselves. The indication is shown if a value is bad or uncertain. When the value is good, the indication is invisible.

*Table 3. Controller Communication Status Indication*

Symbol	Description	Example
	Status is uncertain. Values and information from the controller can not be trusted. Contact your system support.	
	Status is bad. No contact with the controller. Contact your system support.	



## Group Display

A Group Display is a convenient way to view several faceplates for different process objects at the same time, see [Figure 49](#).



Figure 49. Example of a Group Display

# Quad Display

The Quad Display is a special configuration of a group display. The Quad Display makes it possible to toggle between the main view of the four aspects and a full screen view of any of the aspects by using the Zoom tool in the toolbar. See Figure 50.

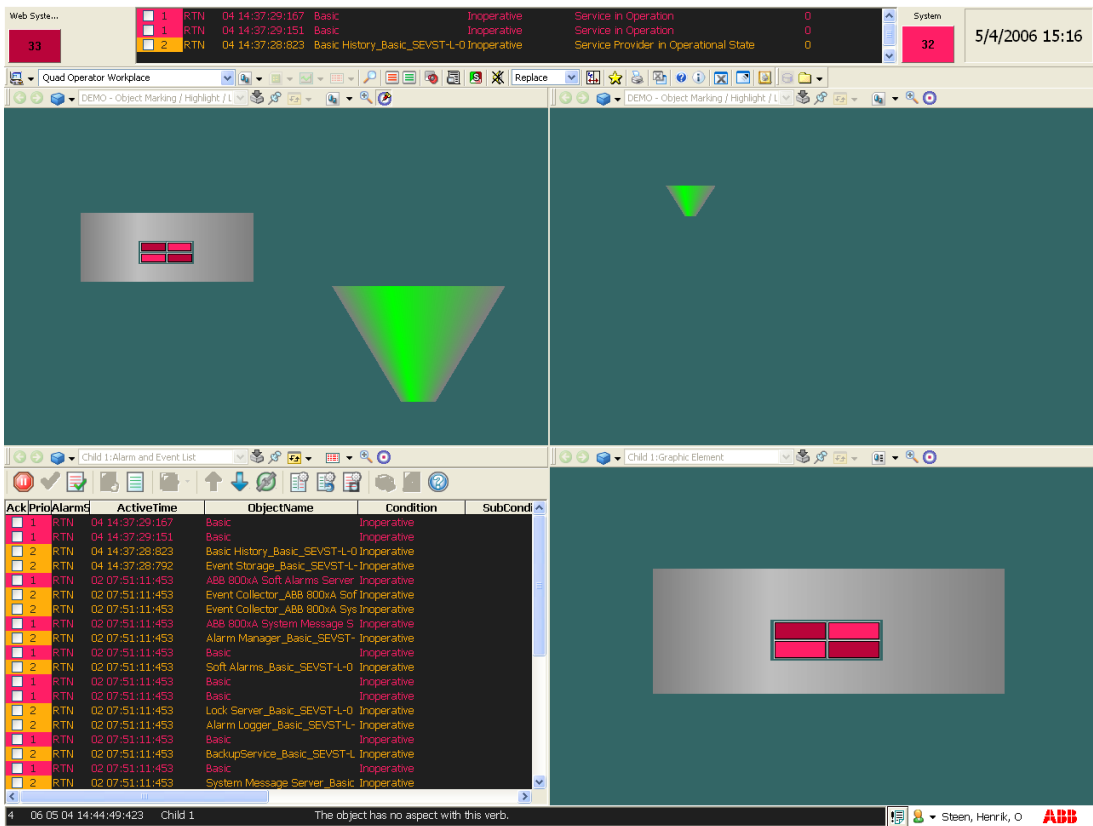


Figure 50. Example of a Quad Display

## Faceplates

A Faceplate is a process dialog for supervision and control. Icon and symbols shown in faceplates are described in [Appendix D, Icons and Symbols](#).

The faceplates can be opened in the following ways, refer to [Figure 51](#):

- From a process display by left-clicking on the process object (graphic element).
- By entering (or selecting) the object name in the Object Shortcut Tool, see [Application Bar](#) on page 22.

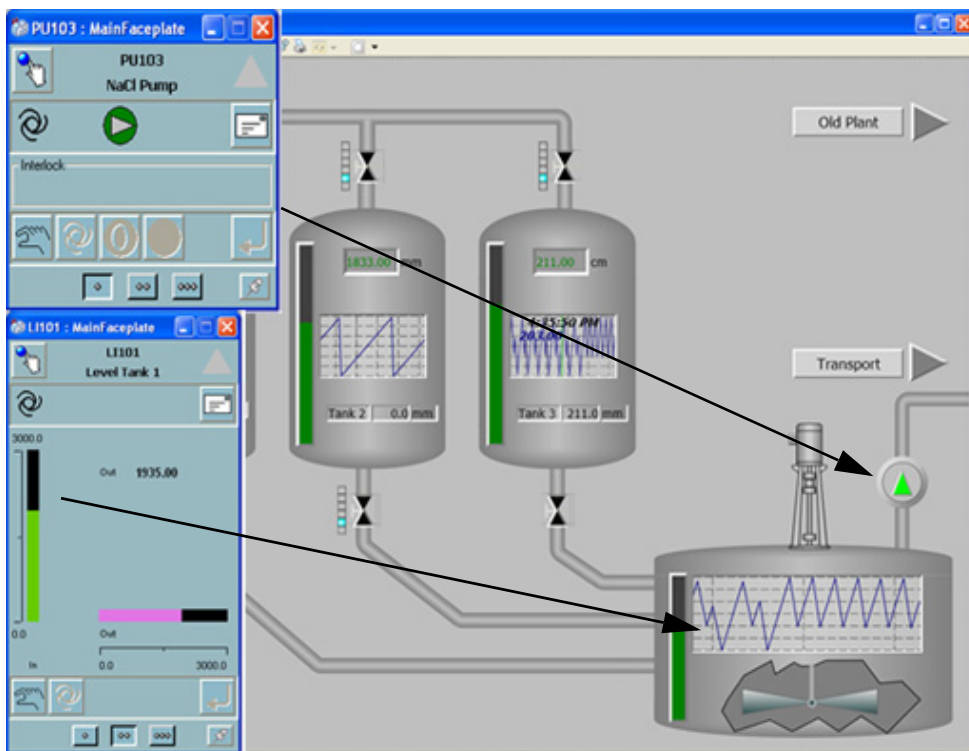


Figure 51. Graphic Display with Faceplates

A faceplate can have up to three different views. Possible views are:

- **Reduced View.** This view is optimized to be as small as possible, and yet cover the most used commands and the most important information on an object.
- **Faceplate View.** This is usually the default view. It is larger than the reduced faceplate, and contains more information and normal operator commands.
- **Extended View.** This view usually has two groups of tabs with additional process information and functionality. This view is used to display the maximum amount of information and is intended for the process engineer or the advanced operator.

The active Faceplate view is indicated at the bottom of the Faceplates, the corresponding **view selection** button is pressed. A non-existing view has the corresponding view selection button disabled.



Figure 52. Reduced Faceplate and Faceplate View and Extended Faceplate

## Signal Faceplate

When using signal faceplates you can manually set a value by using the **Force** button. Click the **Force** button and enter your chosen value. See [Figure 53](#).

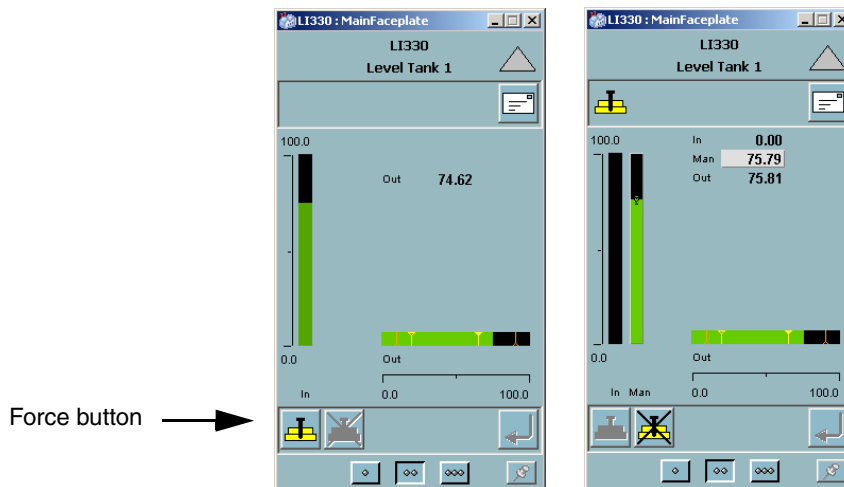


Figure 53. Example of Signal Faceplates

## Overview and Interaction

The faceplates are divided into several areas. The different areas and how to use them are described in this section.



Using faceplates often mean that you change a value or a mode for a process object. Some process critical operations may require an approval for the operation. An approval dialog appears, prompting for User ID and password. See [Approval \(Authentication\)](#) on page 37 for more information about approval.



If **Highlight Follows Faceplate Focus** is selected as highlight mode, hot keys are available for the invocation object. See [Hot Keys](#) on page 55 for more information.

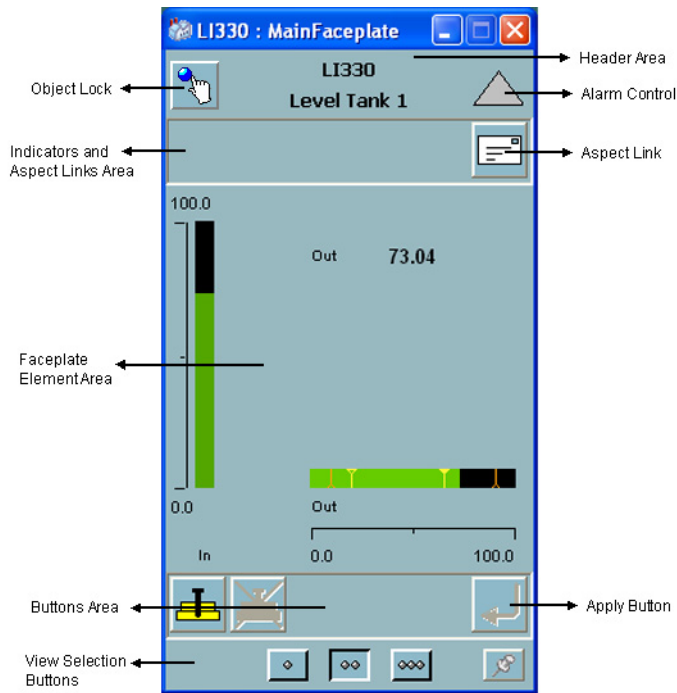


Figure 54. Faceplate Terminology



The different views of a Faceplate affect the size or look of the Status and Navigation bar, the Faceplate element area and the Button area.

## Header

The header is included in each Faceplate. It consists of the following parts:

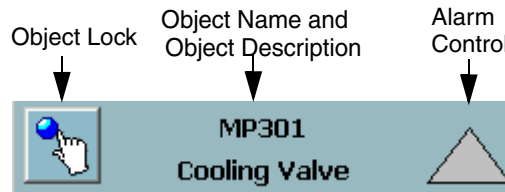


Figure 55. Example of a Header Area

## Object Lock

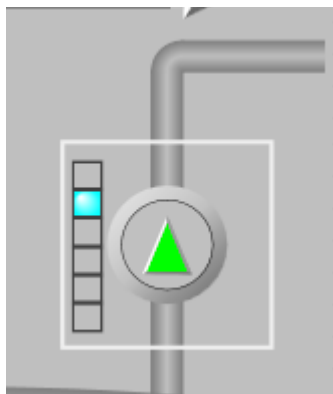


Object Lock is enabled if the Lock Server function is configured. See *System 800xA, Administration and Security (3BSE037410\*)* for more information.

Object lock will give the user the sole right to operate an object. If **Autolock** is enabled the object will be locked from the moment the user opens up the faceplate. If the object lock function is controlled manually, the user has to take the lock by clicking the **Object Lock** button to be able to operate the object. In some cases the lock required option may be enabled, all buttons and commands will then be dimmed until the user clicks the Object Lock button.

The object lock button indication is according to [Table 4](#). The graphic element (in the graphic display) is surrounded by a white frame to indicate that the

object is locked, see [Figure 56](#).



*Figure 56. Example of a Locked Graphical Element*

An object that is locked by another user is indicated as a flat button and yellow icon, see [Table 4](#). A tooltip with information about who has locked the object and from which node is shown if the mouse pointer is placed on the object lock button in the faceplate. No operation on the object is possible when locked by another user.

The table below shows the different object lock states and their corresponding indications.

*Table 4. Lock States Displayed in the Object Lock.*




Lock status	Button	Icon	Background Color
Unlocked	Raised		Bluegrey



Table 4. Lock States Displayed in the Object Lock.

Lock status	Button	Icon	Background Color
Locked by me	Sunken		White
Locked by <i>[name of the user who locked]</i>	Flat		Yellow

When the object is released by somebody else, the button changes from flat to raised and it turns bluegrey. To lock the object simply press the button.

Possible ways to release a lock on an object, is to either click the lock button or to close the faceplate. In case of inactivity of operation action in the faceplate, there is a specific time-out period until the object lock is released.

- **Object Name** displays the primary name of the object. If the width of the **Name** area is not wide enough to display the full name this is indicated by three dots, "...", at the end of the visible text. A tooltip will always show the whole name, when the pointer is positioned above the name.
- **Object Description** displays the description of the object, and the tooltip works the same way as in the name area.
- **Alarm Status** indicates the alarm state and allows to acknowledge the object alarms from the faceplate by clicking the alarm status button. Refer to [Process Events](#) on page 128. Refer to [Table 27](#) for a list of alarm indications.

### Status and Navigation Bar

The left side shows status indicators of the current object status. Shortcuts to other aspect views of the object are displayed to the right, for example Operator Note.



Figure 57. Example of Status and Navigation Bar Area

### Element Area

The faceplate element area in Figure 58 contains two tab groups with the displayed faceplate elements Interlock and TrimCurve.

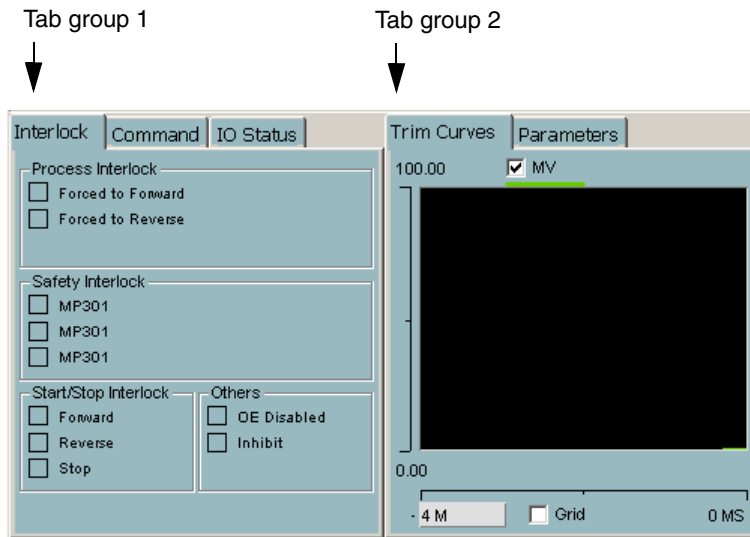


Figure 58. Example of a Faceplate Element Area

The faceplate element area can also contain graphic information as shown in Figure 59.

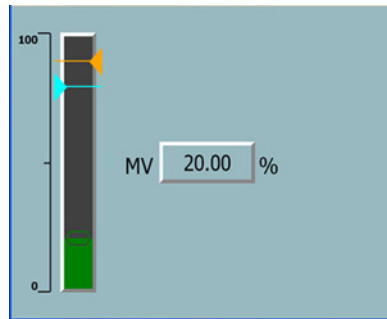


Figure 59. Faceplate Element with Bargraph

- **Bargraph**  
The bargraph displays an object property value. You can modify the value by dragging the handle.
- **Numeric presentation window**  
Displays the value of some object property.
- **Direct entry window**  
Open the handle via a click in the bargraph, or in the numeric presentation. Modify the data in the direct entry window by:
  - Manually enter the value in the direct entry window.
  - Click the Up and Down arrows) in the direct entry window. This changes the value to a smaller range (1%).
  - Use the up and down arrow keys on the keyboard. This changes the value to a smaller range (1%).

Apply the value:

Click the **Apply** button, or press **Enter** on the keyboard.

Cancel and close the direct entry window (there are several ways):

Press the **Esc** key on the keyboard, or click in a neutral area on the side, within the faceplate.

### Buttons

Buttons that control properties of the object are shown in the **Button** area.

See [Table 28](#) for examples of buttons.

Click buttons to operate the object, for example change mode. When you click a button, the effect on the object can, depending on configuration, be direct or applied. Direct means that the effect is performed directly when you click the button. If the action is applied the button appears to be pressed down and the **Apply** button is activated, see **On** button in [Figure 60](#). You have to click the **Apply** button or press **Enter** for the operation to take effect.

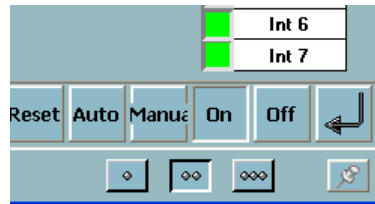


Figure 60. Applied Action Button

### View Selection Buttons

These buttons, see [Figure 61](#), enable you to select one of the three Faceplate views. If a view does not exist, the button representing that view is disabled. The current view is indicated by a pressed button.

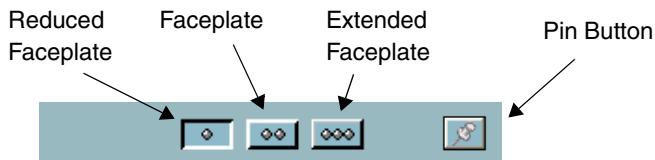


Figure 61. View Selection Buttons

A pinned faceplate will not be replaced when opening a new faceplate. The new faceplate will be opened in a separate window.

## Operator Note

An Operator Note is a message to another operator or a note about an object, in order to remember information about it.



Clicking on the symbol, in the faceplate, opens a window where you can read and write notes regarding the object. You can also access the Operator Note from the context menu.

If the object does not have a note, you can add one from the context menu by choosing **Add Note**.

The dialog for Operator Note is a basic text editor. Write the note and click **Apply**.

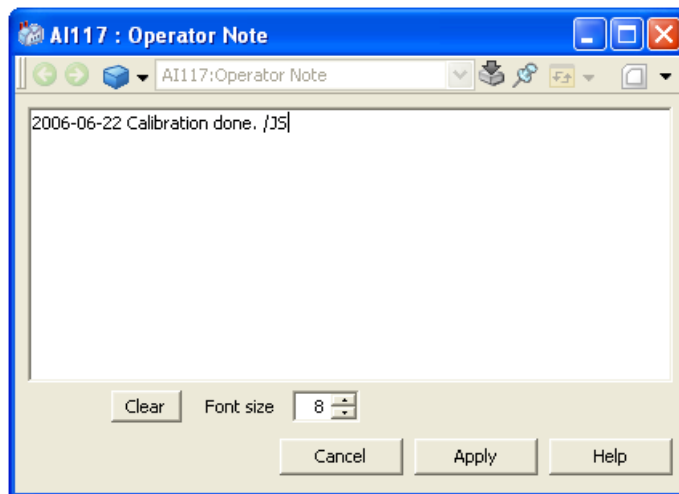


Figure 62. An example of an Operator Note



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## Section 6 Alarms and Events

Alarms and events both from the process and the control system itself can be viewed and acted upon from the Operator Workplace via lists, alarm summary indication etc. The main difference between an alarm and event is that an alarm normally requires an action by an operator for example, acknowledge.

An alarm list only includes the alarms that an operator needs to pay attention to, such as unacknowledged or still active alarms. Some alarms may be hidden which means that they will not be included in the standard alarm list. Hidden alarms can still be viewed in the event list. Typically alarms generated as a consequence of another alarm or alarms that are irrelevant for the operator in the current process operation mode may be configured to be hidden.

An alarm list can be configured to include or exclude group alarms. If group alarms are included, the alarms within groups are not included in the alarm list. Otherwise, all the alarms except the group alarms, are listed in the alarm list.

An event list includes the history for both alarms and events. Alarms or events can have different priorities that are indicated by different colors in for example, lists.



The Alarm Management (Alarm Analysis and Alarm Shelving) features are license protected. The description added for these features in this section, are not applicable for all the users.

### Feature Pack Functionality

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The Alarm Grouping feature is license protected. The description added for this feature in this section, is not applicable for all the users.

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Process alarm and event lists can either include all process alarms or alarms for a specific part of the process down to a single process object.

The following pre-configured lists exist to view different types of alarms and events:

- Process alarm list displaying all process alarms except hidden alarms.
- System alarm list displaying all system alarms for the 800xA System.
- Process event list displaying the process event history.
- System event list displaying the system event history.
- Alarm lists on process objects displaying the alarms for the objects.
- Event lists on process objects displaying the event history for the objects.

## Alarm Analysis

The Alarm Analysis function is an effective alarm management function that allows the operators to monitor the quality of the alarm system and help analyze problems in the alarm system. Refer to *System 800xA, Configuration (3BDS011222\*)* and *System 800xA, Administration and Security (3BSE037410\*)* for information about the Alarm Analysis configuration.

The Alarm Analysis function provides an easy and simple implementation to calculate the Key Performance Indicators (KPIs). The Alarm Analysis service calculates the KPIs and publishes the values as server properties. The Alarm Analysis aspect uses the server properties as OPC properties to enable other aspects such as Log Configuration aspect to reuse the data.

The Log Configuration aspect collects the OPC data for the history of alarms and events. Graphic elements enable visualization of the reports.

One of the key advantages of the Alarm Analysis function over external alarm analysis packages is the easy and precise configuration. By pointing to an Alarm & Event list, the Alarm Analysis function calculates the KPIs accurately for this list without the need to setup complex and error-prone filter configurations. The Alarm Analysis function computes and monitors the following KPIs:

- Number of currently active alarms.
- Number of currently unacknowledged alarms.
- Number of currently hidden alarms.



- Number of currently shelved alarms.
- Average number of alarms per hour (for the latest reporting period).
- Maximum number of alarms per hour (for the latest reporting period).
- Alarm rate (alarms per short term interval).
- Average time to acknowledge alarms (alarms per short term interval).
- Percentage of intervals above acceptability level (for the latest reporting period).
- Percentage of intervals above intense alarm activity level (for the latest reporting period).
- Percentage load of the top 20 alarms (for the latest reporting period).
- 20 most frequent alarms (for the latest reporting period).
- 20 alarms that were active (without interruption) for the longest time (for the latest reporting period).
- 20 alarms (still active) that are active for the longest time (for the latest reporting period).
- Runtime distribution of alarm priorities (for the latest reporting period).  
The priority distribution of the alarms contain an array of 32 integers that represent the number of activations for each priority in the latest reporting period.

The average number of alarms per hour and maximum number of alarms per hour are used as alarm performance benchmarks in the Alarm KPI report.

### **Alarm Analysis Reports**

Navigate to the configured Alarm Analysis object to view the alarm analysis reports. For more information on configuring this object, refer to *System 800xA, Configuration (3BDS011222\*)*.

The Alarm Analysis aspect generates the reports using the configured KPIs. These reports are displayed in Graphic Displays using the Process Graphics (PG2) elements. Following reports are a few examples of KPIs displayed using PG2.

Figure 63 displays a graphical representation of the 20 longest standing alarms for the latest time period.

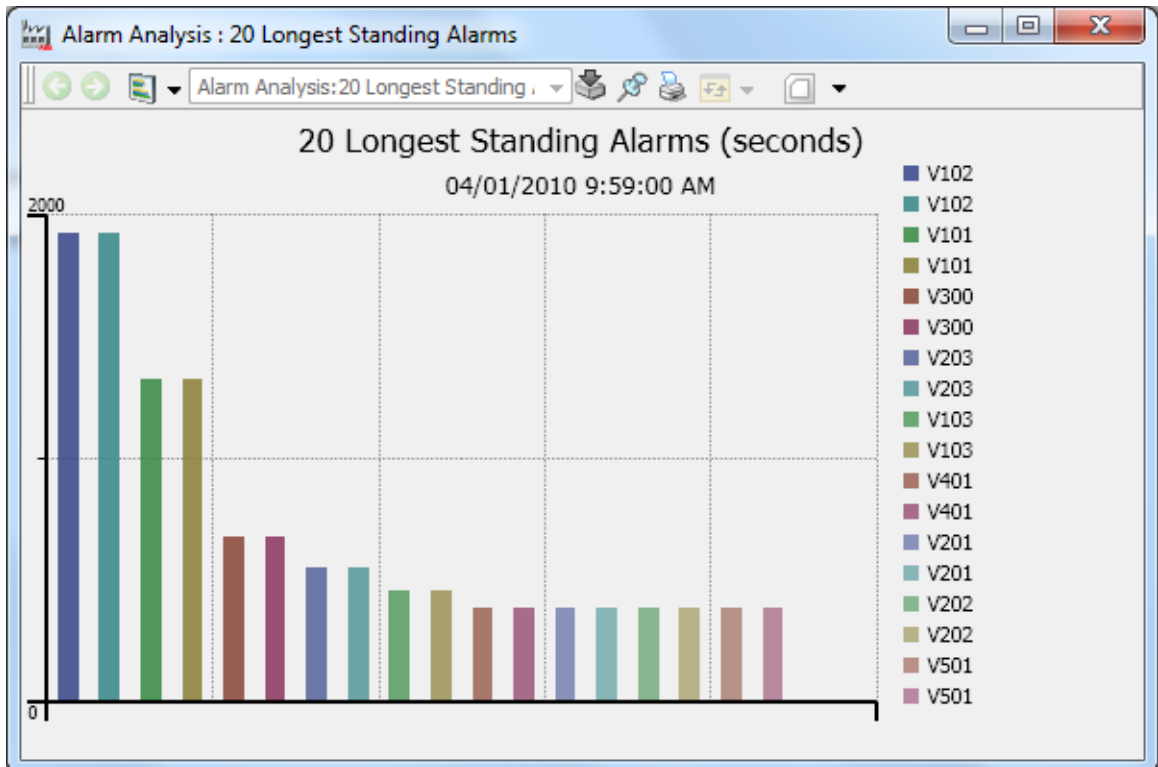


Figure 63. Longest Standing Alarms Report

The longest standing alarms KPI measures the time between activation and deactivation of alarms.

Figure 64 displays a graphical representation of the 20 most frequent alarms for the latest time period. This KPI reflects how often an alarm is activated.

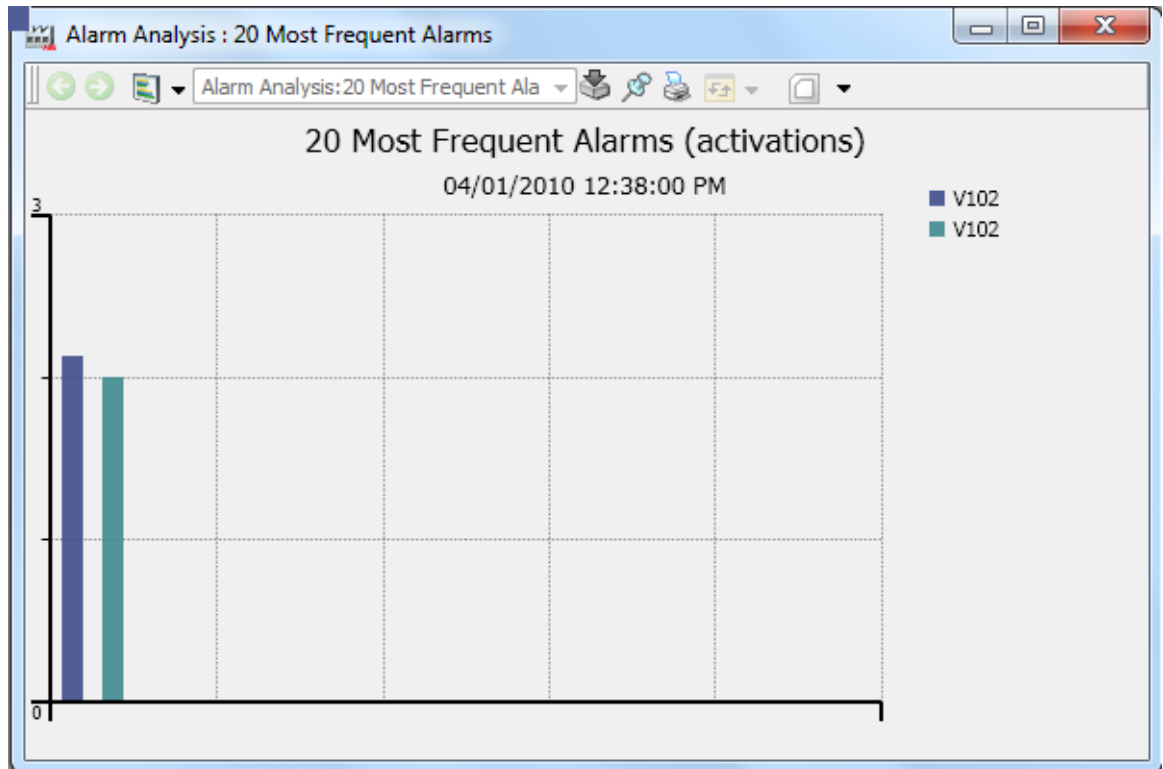


Figure 64. Most Frequent Alarms Report

Figure 65 displays a graphical representation of the alarm priority distribution.

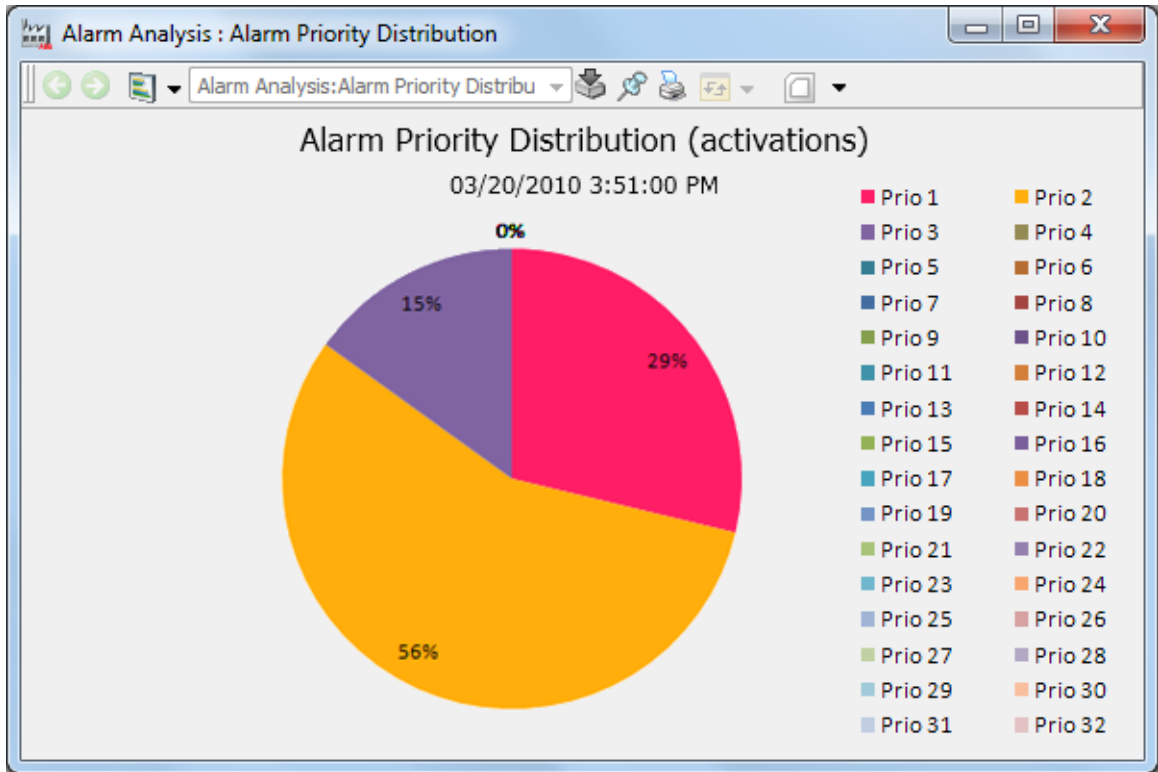


Figure 65. Alarm Priority Distribution Report

Figure 66 displays the average alarm rate and the peak alarm rate in one display.

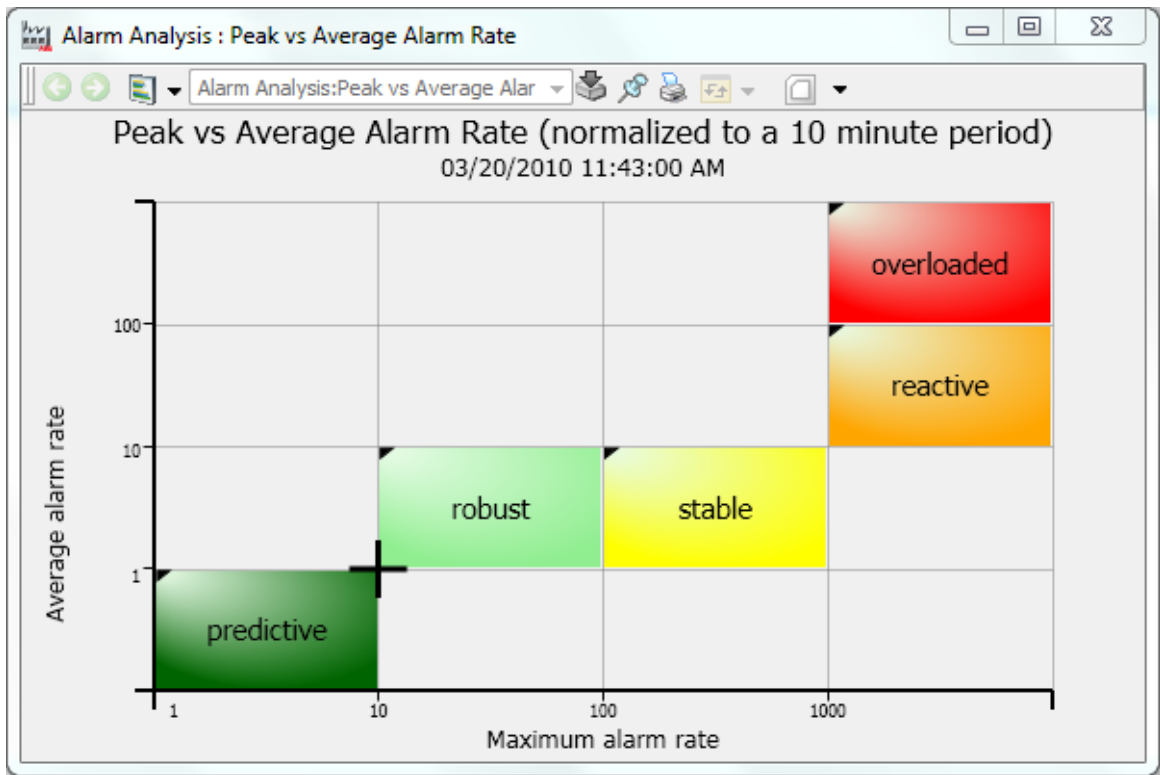


Figure 66. Peak and Average Alarm Rate Report

Figure 67 displays the alarms per short term interval and the acceptability level of the alarm rate.

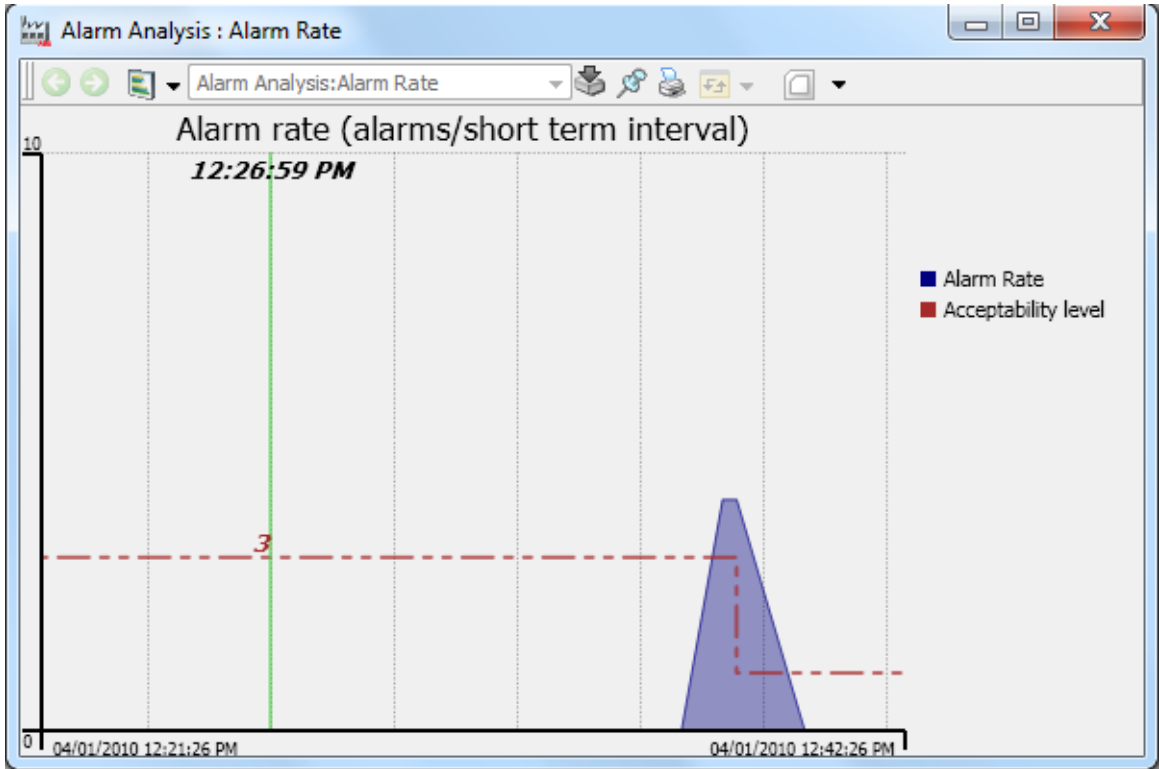


Figure 67. Alarm Rate Report

Figure 68 displays the number of standing alarms for a given reporting period.

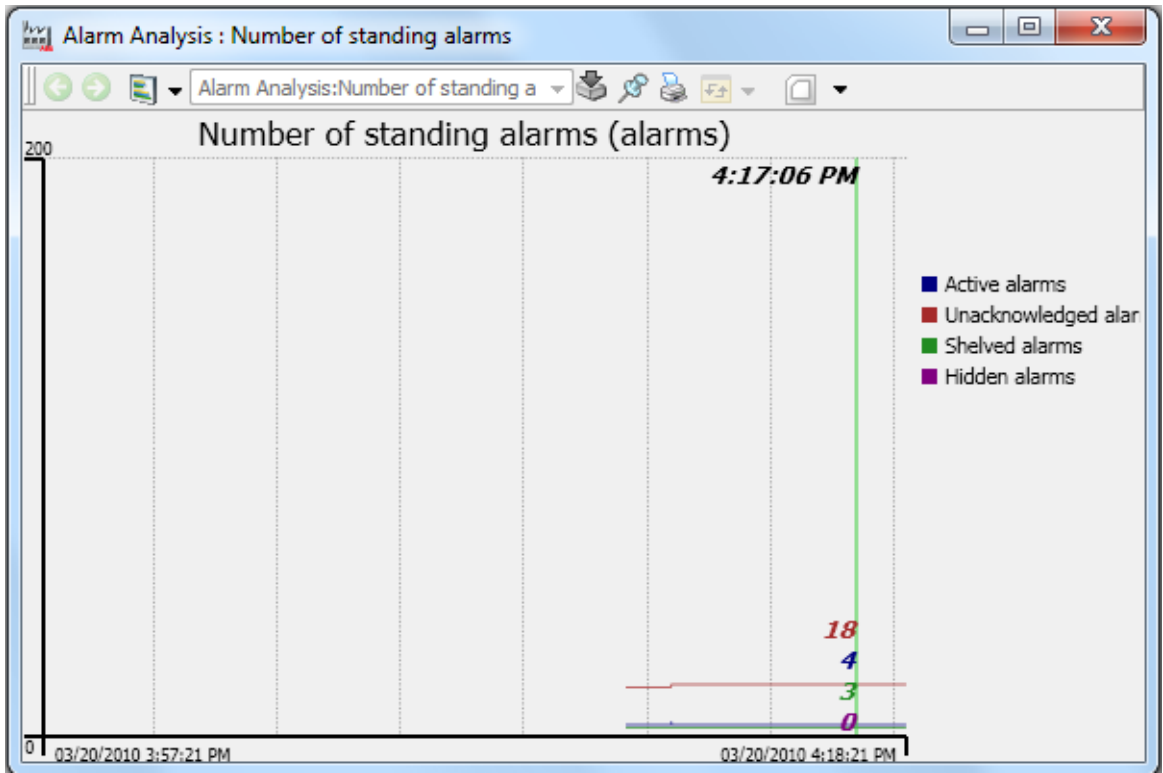


Figure 68. Number of Standing Alarms

Figure 69 displays the average time to acknowledge the alarms.

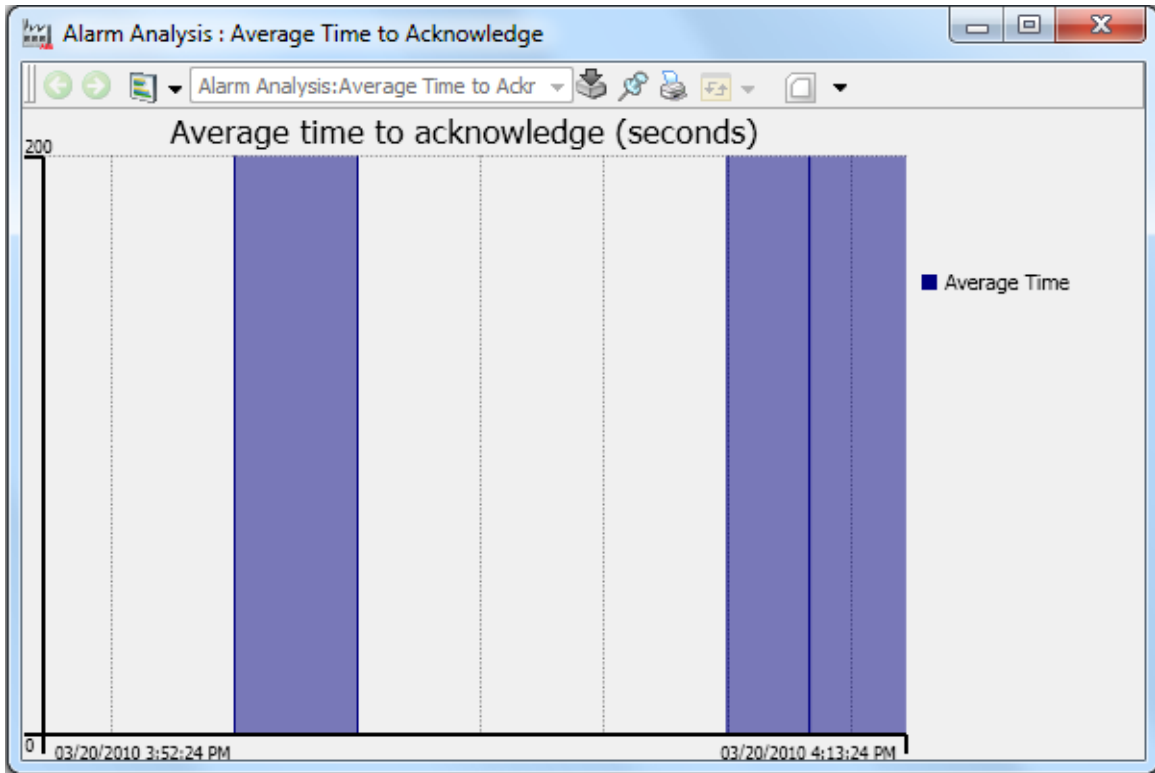


Figure 69. Average Time to Acknowledge Alarms



Keep the cursor over the reports to get a tooltip that gives a detailed information.



If the Alarm Analysis display indicates uncertain data quality, the Alarm Analysis service may have lost contact with the alarm system during the specified reporting period.



### Logging Alarm Analysis KPIs

The Alarm Analysis object includes the Log Configuration aspect that helps archive the numerical Alarm Analysis properties for later reference. The History Source aspect is not included in the Alarm Analysis object. For information about configuring the History Source aspect, refer to *System 800xA, Configuration (3BDS011222\*)*.



The data is lost if the Alarm Analysis object is not configured to collect the values.

## Alarm Grouping



This section applies to the System 800xA 5.1 Feature Pack release only.

A group alarm represents the alarm conditions added to a specific Alarm Group through configuration. Defining Alarm Groups in the system reduces the number of alarms displayed in the operator Alarm List.

Alarm Groups are configured by creating a **Group Alarm Definition** aspect on an object, specifying a group alarm condition, and adding alarm conditions to the Alarm Group. Alarm grouping can be enabled or disabled through the **Group Alarm Manager** aspect in **Library Structure > Alarm & Event > Alarm Grouping Configuration**. The **Alarm Manager Service** in the **Service Structure** controls the runtime functionality of Alarm Groups.

For more information on Alarm Group configuration, refer to *System 800xA, Configuration (3BDS011222\*) and System 800xA, Administration and Security (3BSE037410\*)*.



Shelving a group alarm does not shelve the alarm conditions in the group. Shelving alarm conditions in the group does not shelve the group alarm. The changes in the alarm state of a shelved grouped alarm still affects the alarm state of the group alarm.


Acknowledging a group alarm also acknowledges the alarm conditions in the group.

For more information on alarm shelving, refer to [Alarm Shelving](#).



The alarm conditions in an Alarm Group can be hidden through hiding rules. The group alarm is hidden if all alarm conditions in the group are hidden. For information on alarm hiding, refer to *System 800xA, Configuration (3BDS011222\*)*.

### Group Alarm Indication

In an alarm list, a group alarm is indicated by  in the **GroupAlarm** column of the Alarm List. See [Figure 70](#).

GroupAlarm	Ack	Prio	State	ActiveTime	ObjectName	Condition	Message
	<input type="checkbox"/>	1	RTN	24 15:22:52:532	Mixing tanks	New Condition 2	
	<input type="checkbox"/>	1	RTN	24 15:22:52:235	V102	HI	-HI
	<input type="checkbox"/>	1	RTN	13 13:44:30:878	Basic	Inoperative	Service in Operation
	<input type="checkbox"/>	2	RTN	13 13:44:30:425	BackupService_Basic_	Inoperative	Service Provider in Oper
	<input type="checkbox"/>	1	ACT	01 14:51:16:830	800ASPECTSERVER	New Condition	
	<input type="checkbox"/>	2	ACT	01 14:51:16:798	Remote Access Server	Inoperative	Bad quality data recieve
	<input type="checkbox"/>	1	ACT	01 14:51:16:736	Services	New Condition	
	<input type="checkbox"/>	2	RTN	24 14:20:58:940	RAC_AE_P0_rm1	Inoperative	Service Provider in Oper
	<input type="checkbox"/>	1	RTN	24 14:20:58:643	RAC_AE_rm1	Inoperative	Service in Operation
	<input type="checkbox"/>	3	RTN	24 10:47:27:667	Remote Access Client_	Disconnected	Host ' ' disconnected.

Figure 70. Group Alarm Indication



It is not possible to delete a group alarm using the **Delete** option in the Alarm and Event List context menu.


To delete a group alarm, delete all alarms belonging to the group. Execute the following steps to delete the alarms:

1. View the alarms using the **Show Group** option (see [Viewing Alarm Conditions in an Alarm Group](#)).
2. Right-click the required alarm and select **Delete** from the context menu.

### Viewing Alarm Conditions in an Alarm Group

The user can open an Alarm Group from the Alarm List, to view the alarms included in this group.

Execute one of the following:

1. Click  corresponding to a group alarm in the **GroupAlarm** column to open an alarm list displaying the alarm conditions within this group alarm.
2. Select the required alarm entries and select **Show Group** from the context menu.



**Show Group** is dimmed if the selected alarm entry does not belong to an Alarm Group.

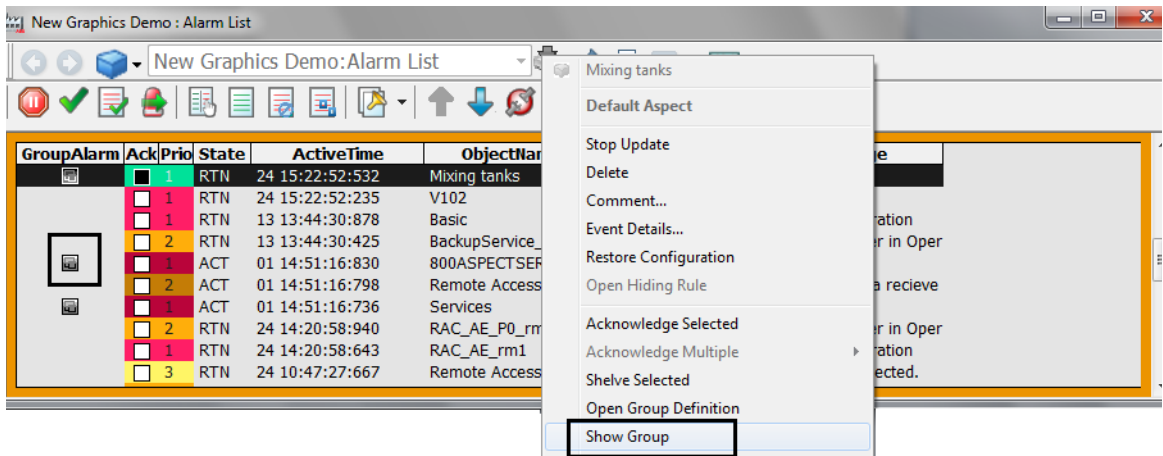


Figure 71. Group Alarm Icon and Show Group

All the alarms included in the Alarm Group are displayed in an overlap window (see [Figure 72](#)).


GroupAlarmNames	Ack	Prio	State	ActiveTime	ObjectName	Condition	Message
Mixing tanks Group Alar	<input type="checkbox"/>	1	RTN	24 15:22:52:704	V203	HI	-HI
Mixing tanks Group Alar	<input type="checkbox"/>	1	RTN	24 15:22:52:313	V202	HI	-HI
Mixing tanks Group Alar	<input type="checkbox"/>	2	RTN	23 15:14:23:351	V202	LO	-LO
Mixing tanks Group Alar	<input type="checkbox"/>	2	RTN	23 15:14:23:351	V501	LO	-LO

Figure 72. Show Group Overlap

In the overlap window, the **GroupAlarm** column is replaced by the **GroupAlarmNames** column. The **GroupAlarmNames** column shows the Alarm Groups for the displayed alarm conditions.

If an alarm condition belongs to several Alarm Groups, the **GroupAlarmNames** column lists all Alarm Groups separated by comma.

### Viewing the Alarm List without Alarm Grouping

Click  in the Alarm List Toolbar to view the grouped alarms and alarm entries not included in Alarm Groups.

Ack	Prio	State	ActiveTime	ObjectName	ObjectDescription	Condition	SubCondition
<input type="checkbox"/>	2	RTN	19 10:43:18:315	Event Collector_ABB 8		Inoperative	Serv
<input type="checkbox"/>	2	RTN	19 10:43:18:221	System Status_Basic_		Inoperative	Serv
<input type="checkbox"/>	1	RTN	19 10:43:18:221	Basic		Inoperative	Serv
<input type="checkbox"/>	1	RTN	19 10:43:17:971	ABB 800xA Soft Alarm		Inoperative	Serv
<input type="checkbox"/>	1	RTN	19 09:01:14:148	V100	Tankfarm inflow	HI	HI
<input type="checkbox"/>	1	RTN	19 09:01:14:117	V402	Tankfarm inflow	HI	HI
<input checked="" type="checkbox"/>	2	RTN	19 09:01:13:976	Event Storage_Basic_8		Inoperative	Serv
<input type="checkbox"/>	1	RTN	19 09:01:13:960	V203	T3 Outflow	HI	HI
<input type="checkbox"/>	1	RTN	19 09:01:13:867	V103	T3 Inflow	HI	HI
<input type="checkbox"/>	2	RTN	19 09:01:13:820	Event Collector_ABB 8		Inoperative	Serv

Figure 73. Show List Without Grouping

## Alarm Response Navigation



This section applies to the System 800xA 5.1 Feature Pack release only.

The Alarm Response Navigation feature allows the operator to navigate quickly different aspects from an object. The following are the features of Alarm Response Navigation:

- Quick navigation to single or multiple aspects using the object context menu or through the Alarm and Event List.
- One time configuration or detailed configuration to enable quick navigation for all types of objects or for an object or object instance respectively.

For more information on configuring the Alarm Response Navigation, refer to *System 800xA Operator Workplace Configuration (3BSE030322\*)*.

### Navigation

Navigation to the configured aspects can be done through the Alarm and Event List viewer or using the object context menu.



The **Alarm Response** option is not visible in the context menu if the *Alarm Response Navigation* feature is not enabled.

The **Alarm Response** option is visible in the context menu but not enabled, if the configured aspects are not resolved for aspect or object references.

For more information on configuring the Alarm Response Navigation, refer to *System 800xA Operator Workplace Configuration (3BSE030322\*)*

- **Navigating through the Alarm and Event List**

In the Alarm and Event List, double-click an alarm and event list entry corresponding to an object to open the configured aspects of this object.

In the Alarm and Event List, right-click an alarm and event list entry and select **Alarm Response** from the context menu. The context submenu includes all the aspects corresponding to the object of the alarm and event list entry (see [Figure 74](#)).

For example, to open the trend display of an object, right-click an alarm and event list entry and select **Alarm Response > Trend Display** from the context menu.

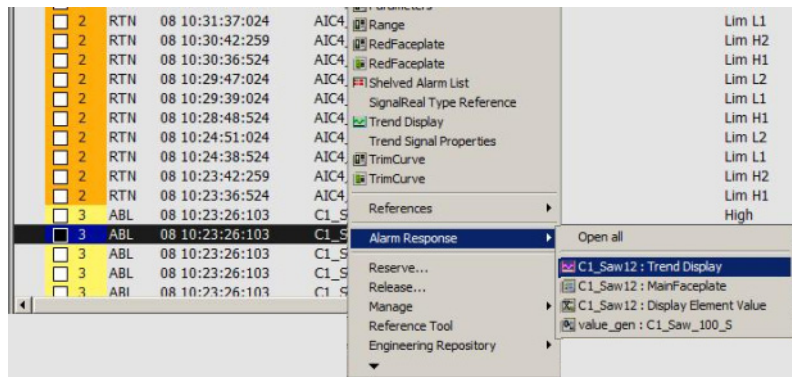
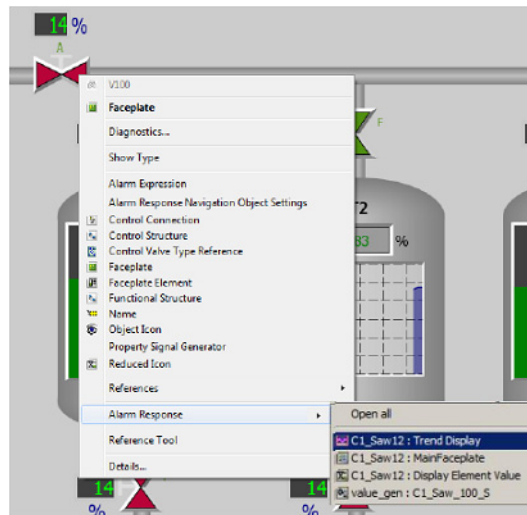


Figure 74. Alarm and Event Context Menu

- **Navigating using the Object Context Menu**

Right-click an object to view the object context menu, and select **Alarm Response**. The context submenu includes all the aspects corresponding to the object of the alarm and event list entry (see [Figure 75](#)).

In the context menu, select **Alarm Response > Open All** to open all the aspects corresponding to the object.



*Figure 75. Object Context Menu*

## AC 800M Status Monitoring



AC 800M Status Monitoring is applicable for the System 800xA 5.1 Feature Pack release only.

When there is a system alarm, the user can bring up the **Hardware Status and Tag Navigation** aspect and quickly navigate to the affected objects. The user can also navigate to the **Hardware Status and Tag Navigation** aspect similar to other aspects.

### Viewing the Diagnostic Information

The **Hardware Status and Tag Navigation** aspect is used to view the status of each Hardware Unit and to navigate to the associated Hardware Units. It is also possible to navigate to the associated objects connected to the channels.

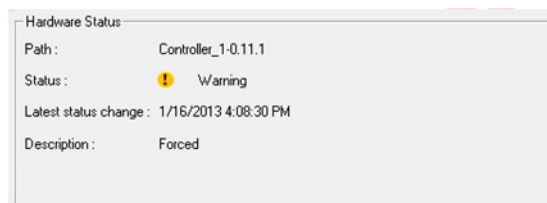
For IO modules, this aspect displays the status of each Hardware Unit, the Channel information, the status and value of the Channel, and object navigation. For other Hardware Units, this aspect only displays the Hardware Status.

The user can access this aspect from the context menu of an Alarm and Event List.

#### Hardware Status




The **Hardware Status** displays status information of the selected Hardware Unit that includes a description of errors and warnings with a status icon.

[Figure 76](#) shows the **Hardware Status and Tag Navigation** aspect for a Hardware Object.



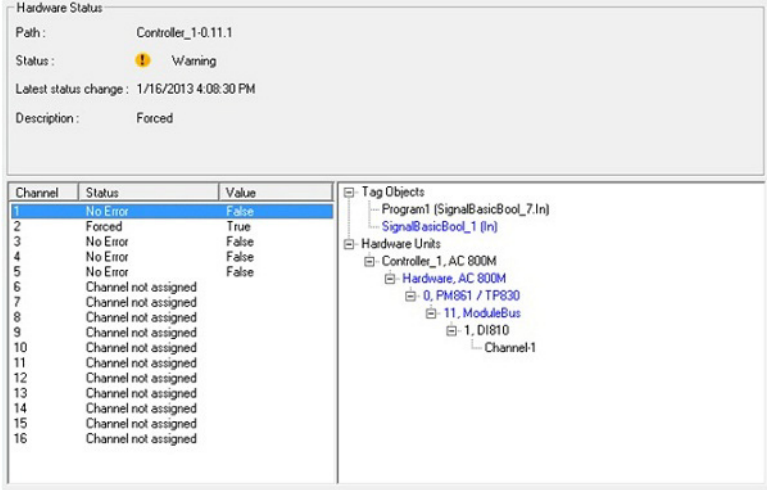
*Figure 76. Hardware Status and Tag Navigation aspect - For a Hardware Object*



- **Path** displays the controller name and the unit path.
- **Status** displays the status symbol.
  -  is displayed if the hardware status is good.
  -  is displayed for any warnings in the hardware.
  -  is displayed for any errors in the hardware.
- **Latest status change** displays the time when the status was last modified.
- **Description** displays a description for the status.

### Channel Information and Tag Navigation

The Hardware Status and Tag Navigation aspect displays the channel information, if the selected Hardware Unit is an IO Module. [Figure 77](#) shows the Hardware Status and Tag Navigation for an I/O Object.



Channel	Status	Value
1	No Error	False
2	Forced	True
3	No Error	False
4	No Error	False
5	No Error	False
6	Channel not assigned	
7	Channel not assigned	
8	Channel not assigned	
9	Channel not assigned	
10	Channel not assigned	
11	Channel not assigned	
12	Channel not assigned	
13	Channel not assigned	
14	Channel not assigned	
15	Channel not assigned	
16	Channel not assigned	


Tag Objects

- Program1 (SignalBasicBool\_7.In)
  - SignalBasicBool\_1 (In)
- Hardware Units
  - Controller\_1, AC 800M
    - Hardware, AC 800M
      - 0, PM8S1 / TP830
        - 11, ModuleBus
          - 1, Di810
            - Channel1

Figure 77. Hardware Status and Tag Navigation aspect - For an I/O Object

- The status information of different channels are displayed.
  - **Channel** displays the channel number of the IO Module.
  - **Status** displays the status of the corresponding channel if assigned to an object. [Table 5](#) shows the different status that is displayed.

Table 5. Channel Status

Status	Description
No Error	This status is displayed if the channel status is good.
Channel not assigned	This status is displayed if the channel is not in use, that is, there is no control variable assigned to this channel.
Status not available	This status is displayed if the data is not available.
	Any other status information displayed in <b>Status</b> , is based on the data received.

- **Value** displays the channel value in the application.
- The tree view displays the Objects and the Hardware Units corresponding to the selected channel, for navigation. This view is displayed for each selected channel.
  - The **Tag Objects** displays the list of objects using the IO Channel.



Click an object highlighted in *Blue* to open the Default Aspect that is configured for this object. For example, a Trend Display or a Faceplate.

Right-click an object to select any aspect available on this object, from the context menu.

- The **Hardware Units** displays the list of Hardware Units of the IO Module.



Click a Hardware Unit highlighted in *Blue* to view the **Hardware Status and Tag Navigation** aspect.

## Process Alarms

Process Alarms are alarms that are generated from the process, such as failure in a valve or pump or an overpressure in a tank.

### Process Alarm List

#### Accessing and Reading

Examples of how to access different Alarm Lists are listed below.

- Click on the Process Alarm List button in the Application Bar to see a list of all process alarms, see [Figure 78](#).
- Click on the Alarm List shortcut in a faceplate to see a list of alarms for a specific object.
- Click on an Alarm Band to see a list of all alarms for a specific process area, see [Figure 78](#). For more about Alarm Band see [Alarm Band](#) on page 121.
- From an Alarm Line in the Application Bar using the context menu (see [Figure 78](#)).

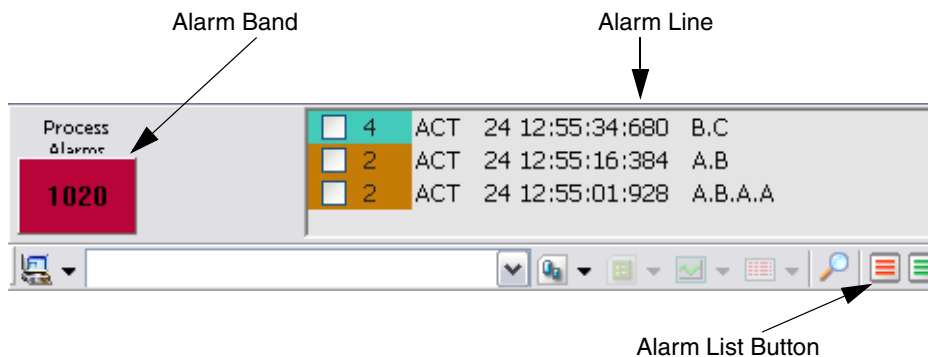


Figure 78. Accessing the Process Alarm List

Ack	Prio	State	ActiveTime	ObjectName	ObjectDescription	Condition	SubCondition	Message	Class
<input checked="" type="checkbox"/>	2	ACT	24 10:59:04:535	B.C	description for B.C	OUTPUT	HI	Alarm 1006	-7323
<input type="checkbox"/>	3	ACT	24 10:59:04:520	A.C	description for A.C	OUTPUT	HIHI	Alarm 1005	-6268
<input type="checkbox"/>	2	ACT	24 10:59:04:520	B.A.A.A	description for B.A.A.A	SETPOINT	LOLO	Alarm 1004	9845
<input type="checkbox"/>	2	ACT	24 10:59:04:520	B	description for B	OUTPUT	LO	Alarm 1003	-9595
<input type="checkbox"/>	1	ACT	24 10:59:04:520	B.A	description for B.A	SETPOINT	LOLO	Alarm 1002	7220
<input type="checkbox"/>	4	ACT	24 10:59:04:520	A.B.A.A	description for A.B.A.A	SETPOINT	HI	Alarm 1001	-3386
<input type="checkbox"/>	2	ACT	24 10:59:04:504	A.C.A	description for A.C.A	SETPOINT	DATA_QUALITY	Alarm 1000	-1148
<input type="checkbox"/>	4	ACT	24 10:59:04:504	B.A	description for B.A	MEASURE	LOLO	Alarm 999	455
<input type="checkbox"/>	4	ACT	24 10:59:04:504	C.B	description for C.B	SETPOINT	LOLO	Alarm 998	-2849
<input type="checkbox"/>	4	ACT	24 10:59:04:488	C.A.A.A	description for C.A.A.A	MEASURE	HI	Alarm 997	-7398
<input type="checkbox"/>	3	ACT	24 10:59:04:488	B.A.A	description for B.A.A	SETPOINT	HI	Alarm 996	9495

Figure 79. Process Alarm List with default Columns

**Columns.** The different columns in the Process Alarm List are described below:

- **AckState** - shows if the alarm is acknowledged or not.
- **AckTime** - acknowledge time.
- **ActiveTime** - shows the time when the alarm was generated.

Feature Pack Functionality



For group alarms, the **ActiveTime** is updated if the state of the group alarm changes from inactive to active, or if the state is changed from acknowledged to unacknowledged, or if the priority is changed to a higher priority.

- **Actor** - shows who acknowledged the alarm.
- **AlarmState** - shows if the state of an alarm by means of a comprehensive abbreviation which can have one of the following values (in precedence order):
  - MBL = Manually blocked, also known as Disabled
  - ABL = Automatically blocked, also known as AutoDisabled or BlockedRepetitive

- HID = Hidden
- ACT = Active
- RTN = Inactive (Return-to-normal)
- **AutoDisabled** - specifies whether the alarm has been autodisabled or not (True/False), or blank if autodisabling is not supported.
- **Category** - grouping of alarms.
- **Class** - classification of the process area.
- **Comment** - shows comments added to the alarm.
- **Condition** - name of the condition, for example Limit exceeded.
- **CurrentValue** - value of the signal related to the alarm condition.
- **EnableState** - shows if the alarm is disabled or not.
- **EventTime** - the time when the alarm transitioned into the state.

#### Feature Pack Functionality

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- **GroupAlarm** - indicates if the alarm is a group alarm.
- **GroupAlarmIds** - shows the Alarm Groups in which the alarm condition is included, in the format <GUID>:<GUID>.
- **GroupAlarmNames** - shows the Alarm Group names in which the alarm condition is included.



For **GroupAlarmIds** and **GroupAlarmNames**, the presentation of an array in the corresponding columns of the Alarm or Event details dialog is a comma separated list of entries.

---

- **Hidden** - shows if the alarm is hidden or not.
- **HidingMaskCondition** - shows the hiding mask condition if the alarm is hidden.
- **HidingMaskName** - shows the hiding mask name if the alarm is hidden.
- **HidingRuleCondition** - shows the hiding rule condition if the alarm is hidden.

- **Message** - short description of the alarm. (The most important system alarm messages are described further in [Appendix A, System Alarm Messages](#))
- **ObjectDescription** - description of the concerned function/component.
- **ObjectName** - the concerned function/component name, node name or both.
- **PriorityLevel** - priority level of the alarm message with 1 being the most important, (1=Critical, 2=High, 3=Medium, 4=Low (See also [Appendix B, Priority Levels for Process Alarms and System Alarms](#)))
- **Quality** - quality associated with the alarm.
- **Severity** - shows OPC severity.
- **Shelved** - indicates if the alarm is shelved.
- **ShelvingMode** - shows the type of mode used to shelve the alarm (normal/one-shot).
- **ShelvingReason** - shows the reason for which the alarm was shelved.
- **ShelvingTime** - shows the time at which the alarm was shelved.
- **ShelfExpireTime** - shows the time at which the alarm will no longer be shelved.
- **SourceName** - name of the object.
- **SubCondition** - shows which subcondition is active.



Additional columns can occur depending on OCS Integration Packages used.

**Context Menu.** Right-click on an alarm to bring up the context menu where you can perform some actions on this alarm line, see [Figure 80](#).

Using the context menu you can also e.g. perform some actions on the alarm list or access any aspect of the object in alarm.

**Errors.** A frame around the alarm list indicates that the data is uncertain or bad.

**Acknowledge** 

Acknowledge alarms for an object in the following ways:

- Click the **Ack State** box for the alarm in the list.
- Right-click an alarm line and select **Acknowledge** (all alarms for that object will be acknowledged) or **Acknowledge Selected** (only the selected object will be acknowledged) from the context menu.
- Select one or several alarms in the alarm list and click the **Acknowledge** button (green check mark)
- Click the alarm status button in a faceplate.
- Use the Hot Key CTRL+SHIFT+Q (all active alarms will be acknowledged).
- In a graphic display, to acknowledge all the alarms for the aspect simultaneously:
  - Click the **Acknowledge All Visible Alarms** icon from the display bar.
  - or
  - Right-click the graphic display and select **Acknowledge All Visible Alarms** from the context menu.



To be allowed to acknowledge an alarm, the users need the corresponding permissions.

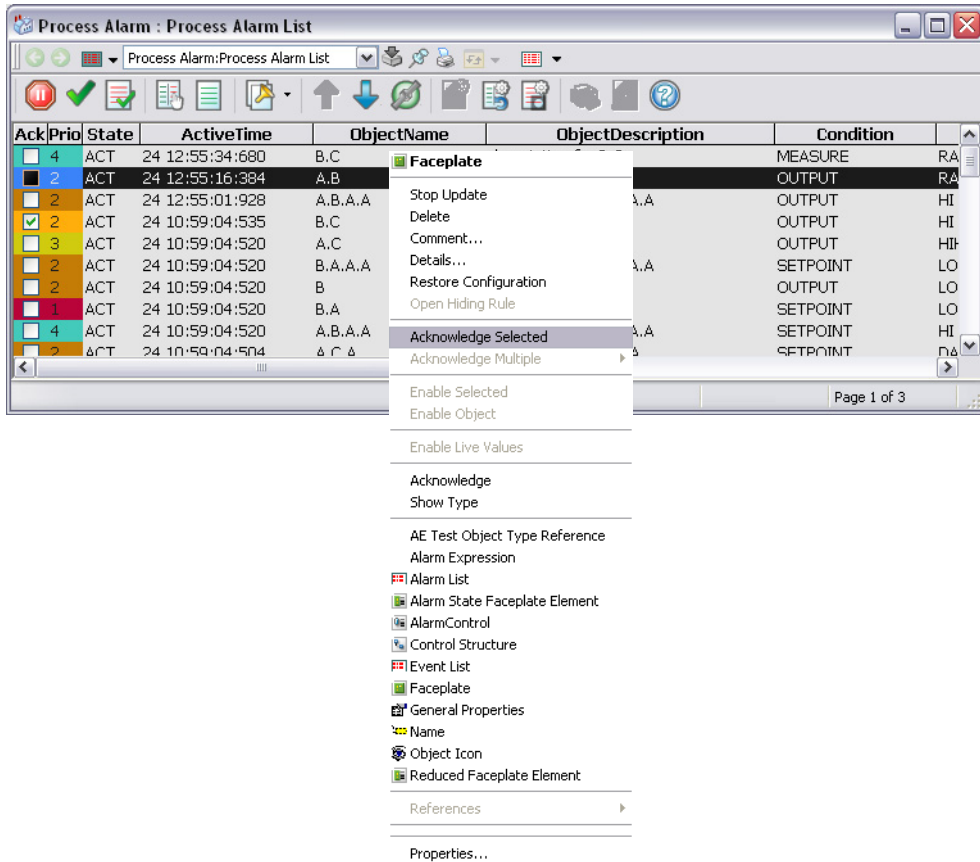


Figure 80. Context Menu for a Process Alarm

### Silence Audible Alarm and External Alarm

To silence an audible alarm, click the **Silence Audible Alarm** button in the Application Bar. To silence an external alarm you click the **External Alarm Silence** button in the Application Bar.



This is a one shot type action that silences the current audible/external alarm. If a new audible/external alarm then occurs, that alarm must be silenced again.



To silence an audible or an external alarm does not mean that the alarm is acknowledged.

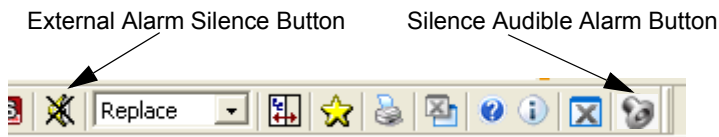


Figure 81. Silence in the Application Bar

### Alarm Shelving

Shelving is a facility where operators can shelve nuisance or standing alarms for a specified time. There are two modes available to shelve an alarm:

- Standard shelving (Manual).
- One-shot shelving.

For more information about alarm shelving, refer to *System 800xA, Configuration (3BDS011222\*)*.

To shelve one or more alarms from the operator workplace:

1. Select an alarm in the main alarm list -> right-click and select **Shelve Selected** from the context menu. Refer to [Figure 82](#).

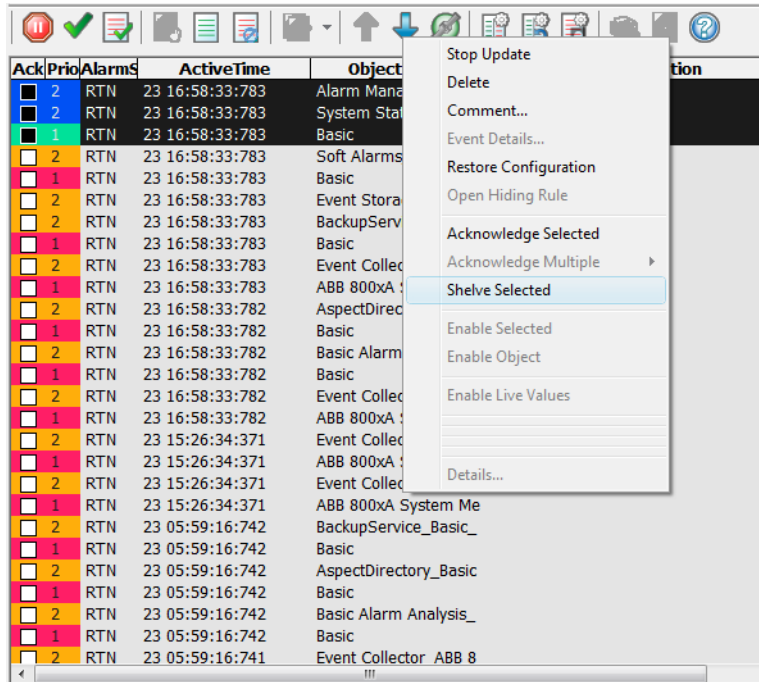


Figure 82. Shelve Selected Context Menu



A Shelving Authentication dialog is displayed if operator authentication is required for shelving the alarms.

2. In the Shelve Alarm(s) dialog (Figure 83):

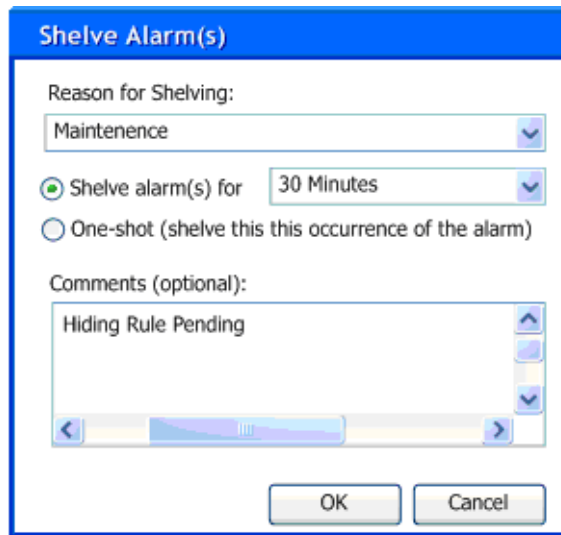


Figure 83. Shelve Alarm(s) Dialog

- a. Select a reason for shelving from the drop-down list.
- b. Select the **Shelve alarm(s) for** or **One-shot** shelving option.  
If the **Shelve alarm(s) for** option is selected, select a shelving time from the drop-down list.
- c. Enter comments in the **Comments** text box, if required.
- d. Click **Ok**.

### Working within a Process Alarm List

Operator activities describing how to work with a Process Alarm List are described below.




**Process Alarm List Tool Bar.** Below are the different tools in the Process Alarm List Tool Bar described:







Figure 84. Process Alarm List Tool Bar





#### Feature Pack Functionality











The icons , , and  in the Alarm List Toolbar (see [Figure 84](#)) applies to the System 800xA 5.1 Feature Pack release only.

- **Start/Stop**  - To start, restart or stop list updates. If you click the **Start/Stop** button the alarm list stops updating until the **Start/Stop** button is clicked again. While the list update is stopped, the operator can easily view the error list. When the alarm list is stopped, a red and orange frame is shown around the alarm list to indicate that the list update is stopped.
- **Acknowledge**  - See [Acknowledge](#) on page 106.
- **Remove**  - To remove an alarm from the list select it and click **Remove**.
- **Acknowledge the Visible Alarms**  - To acknowledge all alarms that are visible in the list.





#### Feature Pack Functionality

- **Alarm Response Navigation**  - For more information, refer to [Alarm Response Navigation](#) on page 97.
- **Details**  - To see extended information about the selected alarm.
- **Show Shelved Alarms**  - To view the list of shelved alarms.
- **Show Events**  - To see the events of the alarm list in a separate event list. The event list will have the same filter as the alarm list.

## Feature Pack Functionality

- **Show List Without Grouping**  - To view the grouped alarms and alarm entries not included in Alarm Groups.
- **Select attribute filter set**  - To remove the current filter. Click the drop-down menu to select a predefined attribute filter. If a filter is selected, this will be indicated between the toolbar and the alarm list.
- **Enable Live Values**  - To display the value of the default property for the object. This is only available if the current value column is included in the list.
- **Page Up**  - To show the previous 500 alarms in the list.
- **Page Down**  - To show the next 500 alarms in the list.
- **Connected to all Servers**  - To view the System Status Viewer.
- **Reset Runtime Configuration Changes**  - To restore the initial view if any changes are done to the alarm list.
- **View Hiding Configuration**  - To view the Hiding Mask Manager.

## Feature Pack Functionality

- **View Grouping Configuration**  - To view the **Group Alarm Manager** or the **Group Alarm Definition** aspect. For more information, refer to *System 800xA, Configuration (3BDS011222\*)*.
- **Print List**  - See [Print](#) on page 120.
- **Print Preview**  - See [Print](#) on page 120.
- **Help**  - To view the online help for more information.

**Hot Keys in the Alarm List.** There are a set of hot keys available in the alarm list for fast access to alarm operations.

*Table 6. Hot Keys*

Operation	Hot Key
Copy to clipboard	CTRL+C
Select all Alarms/Events	CTRL+A
Stop Update	CTRL+SHIFT+ALT+U
Remove Selected	CTRL+R
Remove Page	CTRL+SHIFT+ALT+R
Remove Whole List	CTRL+SHIFT+ALT+W
Acknowledge Selected	CTRL+SHIFT+A
Acknowledge Page	CTRL+SHIFT+ALT+A
Acknowledge Object	CTRL+SHIFT+R CTRL+SHIFT+Q
Acknowledge Whole List	CTRL+ALT+W
Reload Configuration	CTRL+SHIFT+Home
Show Details	CTRL+SHIFT+D
Page Up	CTRL+SHIFT+PageUp
Page Down	CTRL+SHIFT+PageDown
View Hiding Configuration	CTRL+SHIFT+ALT+M
Print List	CTRL+ALT+P
Print Preview	CTRL+SHIFT+ALT+P

**Marking and Selecting Rows.** The different methods of selecting rows are:

- Click on a row to select it. The selected row becomes highlighted.
- Press the **Ctrl** key and click on another row to select nonsequential rows.

- Press the **Shift** key to select a sequential group of rows. For example, select row 2, hold the **Shift** key and then select row 9 to select rows 2 through 9.
- Click and drag to select a sequence of rows.

When a row is marked/selected you can take ‘Actions’ on the message or view the Details. If more than one row is marked then the action takes place on all the marked rows if the action is applicable. For example, suppose 3 alarm lines have been selected and 2 of the 3 alarms are unacknowledged, then selecting Ack will have no effect on the alarm which is already acknowledged.

**Sizing Columns and Rows.** Size a column by grabbing the column header edge and moving it right or left.

Size a row by grabbing a row bottom or select all rows and moving the bottom edge up or down. This change is only in effect while this view is active.

**Sorting Columns.** To sort a column double-click on the column header. Repeat this action to reverse the sorting. For example, sorting **Object Name** once may cause the items in the list to be sorted in alphabetical order (A...Z). Sorting a second time will cause the sorting to be reversed (Z...A).

**Moving Columns.** To move a column, do as follows:

1. Select the column you want to move by clicking on the column header (as indicated by a down arrow pointer). This will highlight the column as shown in [Figure 85](#).
2. The pointer changes from a filled downward short pointer to a left upward thin pointer. Now you can move the column.
3. Click in the table head and drag the column to the new location. A red line marks the position between columns where you can place the column. See [Figure 85](#).

In a similar manner, two adjacent columns can be selected and moved. This change is only in effect while this view is active.

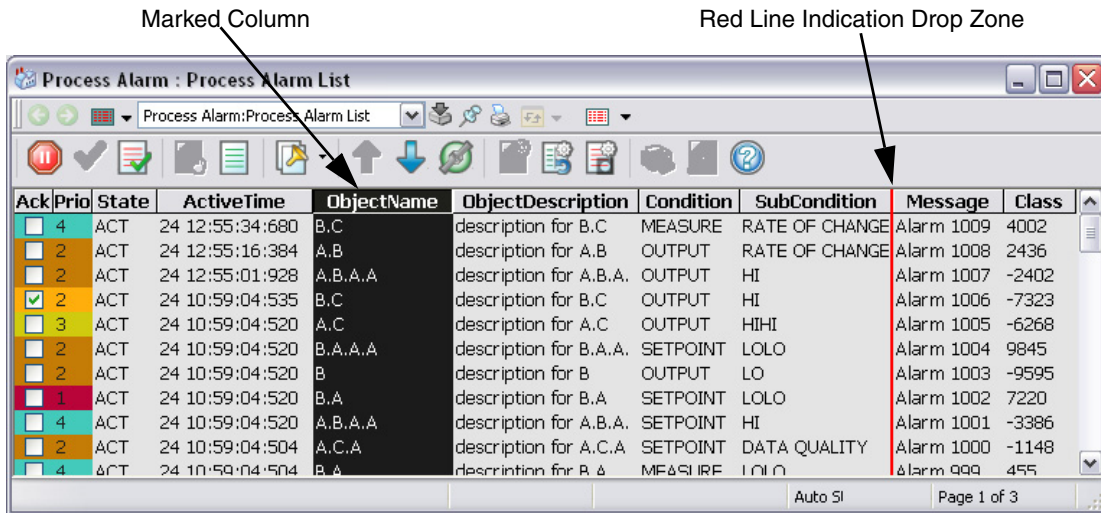


Figure 85. Moving a Column in a Process Alarm List

**Filtering Columns.** It is possible to filter columns in Process Alarm List.

For example if you only want to see alarms within a certain time interval or alarms that belong to one special object. If more than one column has a column filter activated, the list will show the intersection of the conditions (i.e. AND-conditions).



If a filter is activated on the column, the column name is marked with an asterisk (\*). For example, if you have a column in the list named “**Active Time**”, this will be “**Active Time\***” if you set and activate a column filter.

To filter a column:

1. Right-click on the column header.
2. A filter dialog according to [Figure 86](#) is displayed.
3. The example below is the **ObjectName** column:



- a. **Expression 1 - equal, less than or larger than.**  
To this you may add a second condition which shall be fulfilled together with the first (select **And**) or the first or second alone (select **Or**).
- b. **Expression 2** (select in the drop-down menu)
- c. **Clear Filter** - This will clear the filter to default (no filtering).

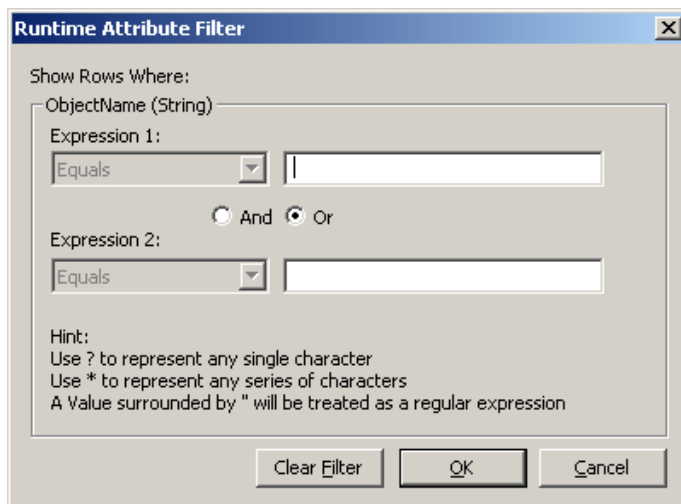


Figure 86. Filtering Columns

The filter dialog allows queries using the wild cards “?” (matches one character) and “\*” (matches zero or more characters). This allows easy queries for example all objects that starts with P12 by writing P12\* as condition.

A more powerful and advanced method is available by quoting the query like this “query”. The query between the quotes allows specifications of queries like: list all alarms on objects with a name starting with A followed by one digit in the range 2-3 and ends with \_Valve. This query is expressed as “A[2-3]\_Valve”.

The following expression can be used:

Table 7. Expressions

Character	Meaning
.	Matches any single character. Same as "?" in a simple query.
[]	A character class that will match all character inside the brackets. [AB] will match all strings containing the character A or B.
^	If this metacharacter occurs at the start of a character class, it negates the character class. A negated character class matches any character except those inside the brackets (for example, [^abc] matches all characters except "a", "b", and "c"). If ^ is at the beginning of the regular expression, it matches the beginning of the input (for example, ^[abc] will only match input that begins with "a", "b", or "c").
-	Specifies a range of character or digits if used inside a character class. Example [A-D] matches all characters in the range A to D and [2-6] matches all digits in the range 2 to 6.
?	Indicates that the preceding expression is optional, i.e [0-9][0-9]? matches both one and two digits.
+	Indicates that the preceding expression matches one or more times, for example [2]+ matches 2, 22, 222 and so on.
*	Indicates that the preceding expression matches zero or more times.
??, +?, *?	Tries to match as little as possible. Example the expression <.*?> on the string "<abc><def>" will match <abc> while the expression <.*> will match the whole string "<abc><def>".
()	Grouping operator. For example ([0-9_]*) will match 0 a string of digits separated with underscores, like 0_ , 0_1, or 0_1_1.

Table 7. Expressions (Continued)

Character	Meaning
\	Escape character, used to be able to match character with other special meaning in an expression. Example: [0-9]\+ matches a digit followed by a plus sign and not one or more digits.
	Separates two expressions, for example A O in a character class matches both A and O
!	Negation operator. A!B matches a string starting with A and not followed by a B.
{ }	Indicates a match group.
\$	At the end of a regular expression, this character matches a digit at the end of the input.

There are some abbreviations that could simplify an expression if used. The following exist:

Table 8. Abbreviations

Abbreviation	Matches
\a	Any alphanumeric character: [a-zA-Z0-9]
\b	White space (blank): ([ \t])
\c	Any alphabetic character: [a-zA-Z]
\d	Any decimal character: [0-9]
\h	Any hexadecimal digit: ([0-0a-fA-F])
\n	Newline: (\r \r?\n)
\q	A quoted string: (\("[^"]*" '\'^']*')
\w	A simple word: ([a-zA-Z]+)
\z	An integer: [0-9]+

Together with a good naming standard for process objects could this advanced query method be very useful applied to the column **ObjectName**.

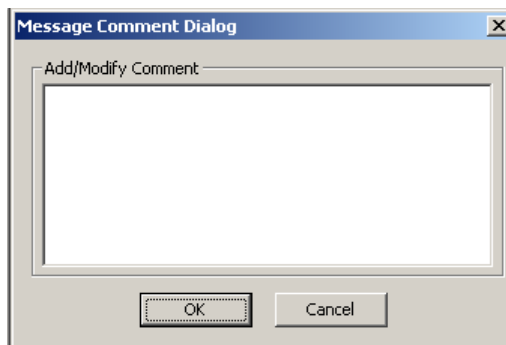


The column filters are cleared by clicking the **Clear Filter** button for each column. The filters are also cleared when closing the Process Alarm List window.

**Navigation.** If you double-click on an alarm line in the alarm list the default aspect for the process object/alarm will appear, most common a faceplate.

**Adding Comments.** To add a comment for an alarm do as follows:

1. Right-click on the alarm to which you want to add a comment.
2. Select **Comment** from the context menu.
3. The Message Comment dialog box is displayed and you can type a message in the **Add Comment** area. The comment will be shown in the Comment column in the alarm list. An event that shows the comment and when it was made will also be generated in the event list. See [Figure 87](#).



*Figure 87. Message Comment Dialog Box*

## Print

If you click on the **Print List** button the shown list will be printed on a default local or network printer.

If you click the **Print Preview** button the shown list will be presented in a preview window (only if you have printer software installed in your workstation).

The **Print List** and **Print Preview** buttons are only enabled when the update is stopped. When stopped, the column sizes and positioning revert back to default, after which it may be changed to suit your current needs. These changes are reflected in the print out; thus print preview is not needed other than to view which columns are placed on which pages and to determine the number of pages.

The filters setting are written at the bottom of each page along with the current date, page number, and number of pages.

### **Moving Process Alarm Data to other Applications**

It is possible to copy data from an Alarm List, and then paste it into a third party software application such as Microsoft Excel. To do this:

1. Select the data in the Alarm List to be copied.
2. Press **Ctrl+c** to copy the data.
3. Go to the external application and use the paste function (**Ctrl+v**).

## **Alarm Band**

### **Accessing and Reading**

The Alarm Band provides a link to its Alarm List. The number within the band represents the number of unacknowledged alarms. The color of the band represent the highest priority alarm present.

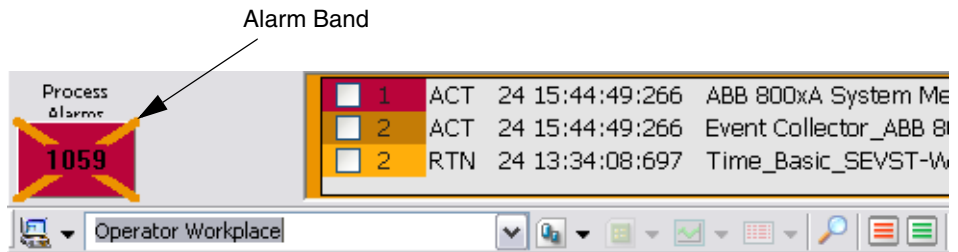


Figure 88. Alarm Band

A red cross over the Alarm Band indicates that the alarm band does not have contact with **any** server. If the cross is orange some server providing alarms is not accessible, the data can also be uncertain or bad.

If the Alarm Band looks like in the figure above (Figure 88), the alarm band has lost contact with **some** server (partial connected). In this case it is still possible to for example make acknowledge.

**Hidden Process Alarms.** The Alarm Band can indicate if there are any hidden alarms. Hidden alarms are often secondary alarms. For example a secondary alarm such as 'Low Pressure' that always follows from the 'Pump Stopped' alarm.

In Figure 89 the alarm band to the left indicates that there are 23 unacknowledged alarms, 26 acknowledged alarms and 6 hidden alarms. Note that this is an example of an alarm band configuration. It may look different depending on configuration, for example the application engineer may not have included the indication of the unacknowledged and hidden alarms in the alarm band.

If you want to bring up the alarm list with the hidden alarms, click on the area at the lower part of the alarm band (which is white by default).

The hidden alarm list uses the same configuration as the alarm list, except that it overrides the hidden filter to show only hidden alarms.

The alarm band to right has 23 unacknowledged alarms, 26 acknowledged alarms and 0 hidden alarms. You can also see that the hidden alarm list is empty by the indication on the lower area of the alarm band. It has the same behavior and color as the upper area.

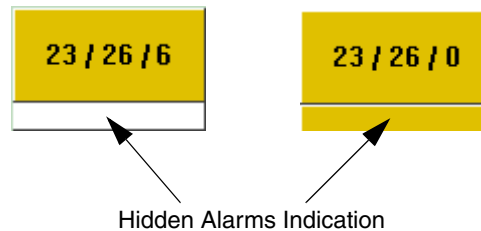


Figure 89. Hidden Alarms

**Shelved Process Alarms.** Alarm Band indicates if there are any shelved alarms. The indication of the band is similar to hiding. Click the upper section of the alarm band (black by default) to navigate to the shelved alarm list. Refer to [Figure 90](#) for more information.

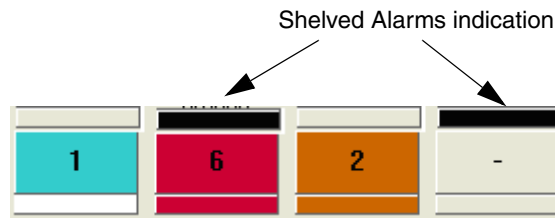


Figure 90. Shelved Alarms

The shelved alarm list uses the same configuration as the alarm list, except that it overrides the shelved filter to show only shelved alarms.

## Alarm Sequence Bar

### Accessing and Reading

The Alarm Sequence Bar is an alternative to the Alarm Band in the Application Bar.

The Alarm Sequence Bar is a status display, where the defined number of alarms are displayed horizontally. New alarms are introduced from the right.

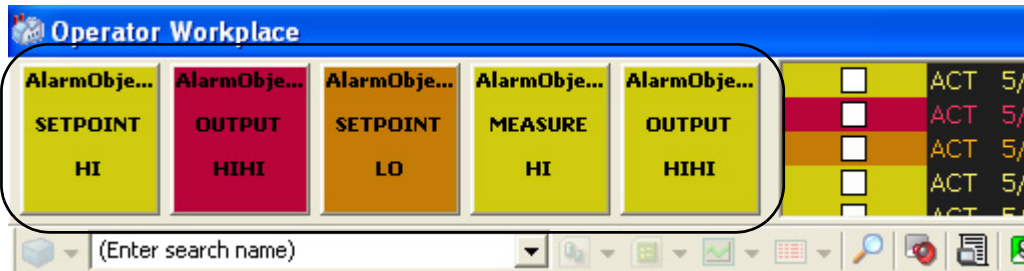


Figure 91. Alarm Sequence Bar

**Context Menu.** Right-click on a column/alarm in the alarm sequence bar to bring up the context menu where you can perform some actions on the alarm. For example you can acknowledge the alarm by selecting **Acknowledge**. If you select **Details...** a dialog with extended information about the alarm you chose will be shown.

**Errors.** A red cross over the Alarm Sequence Bar window indicates that the alarm sequence bar does not have contact with all redundant service providers. If the cross is orange the redundant server is down and the sequence bar is trying to connect to the other server. It can also be partial connected, that is the sequence bar has contact with some redundant service provider.

## Alarm Logger Manager

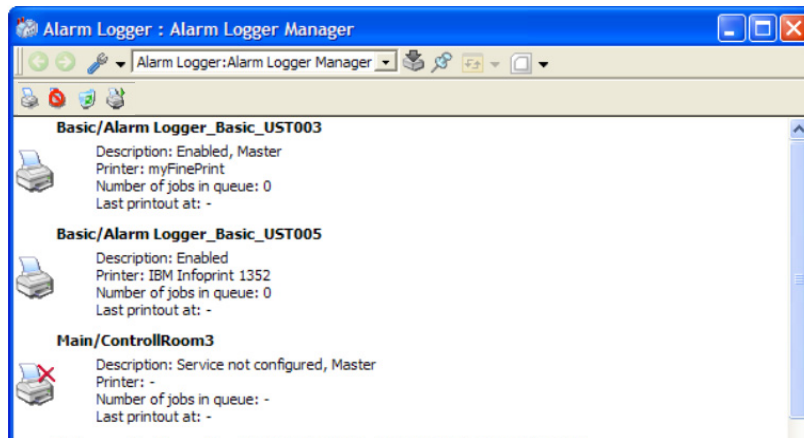
The Alarm Logger Manager is accessible via the Application Bar (if configured), see Figure 92. It is also possible to access it via a Hot Key, if this is configured for your Operator Workplace.



Figure 92. Alarm Logger Manager in the Application Bar



All available printers will be shown in the Alarm Logger Manager dialog. See [Figure 93](#).



*Figure 93. Alarm Logger Manager*

The Alarm Logger Manager toolbar has the following tools (also available from the context menu):

- Enable Printing - Enables the alarm logger function.
- Disable Printing - Disables the alarm logger function.
- Clear Jobs - The buffered jobs in queue are cleared.
- Force Print - The buffered jobs in queue are printed.

## System Alarms

System Alarms are alarms generated from the 800xA System, such as network problems, hardware errors or server errors.

In many cases these alarms need to be taken care of by your system administrator. For information about system alarm messages see [Appendix A, System Alarm Messages](#).

## System Alarm List

### Accessing and Reading

There are several ways to access an System Alarm List for an object. The following are some typical examples:

- from the System Alarms button in the Tool Bar (see [Figure 10](#))
- from an Alarm Line in the Application Bar using the context menu (see [Figure 78](#))
- from an Alarm Band button in the Application Bar (see [Figure 94](#)).

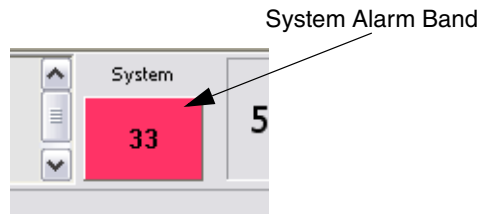


Figure 94. Accessing the System Alarm List

Ack	Prio	State	ActiveTime	ObjectName	Condition	Message	Class	NodeName
<input type="checkbox"/>	2	RTN	24 13:34:08:697	Time_Basic_SEVST-W-0002389	Inoperative	Service Provider in Operational State	0	
<input type="checkbox"/>	1	RTN	24 13:34:08:697	Basic	Inoperative	Service in Operation	0	
<input type="checkbox"/>	2	RTN	24 13:32:32:860	BackupService_Basic_SEVST-W-0002389	Inoperative	Service Provider in Operational State	0	
<input type="checkbox"/>	1	RTN	24 13:32:32:860	Basic	Inoperative	Service in Operation	0	
<input type="checkbox"/>	2	RTN	24 13:32:23:352	Time_Basic_SEVST-W-0002389	Inoperative	Service Provider in Operational State	0	
<input type="checkbox"/>	1	RTN	24 13:32:23:352	Basic	Inoperative	Service in Operation	0	
<input type="checkbox"/>	2	RTN	24 10:52:47:879	EC TestServer	Inoperative	Service Provider in Operational State	0	
<input type="checkbox"/>	2	RTN	24 10:52:20:207	EC TestServer	Inoperative	Service Provider in Operational State	0	
<input type="checkbox"/>	1	RTN	24 10:52:12:301	TestServer	Inoperative	Service in Operation	0	
<input type="checkbox"/>	2	RTN	24 10:50:25:488	Event_Collector_ABB 800xA System Mess	Inoperative	Service Provider in Operational State	0	
<input type="checkbox"/>	1	RTN	24 10:50:24:035	ABB 800xA System Message Server	Inoperative	Service in Operation	0	

Figure 95. System Alarm List with default Columns

**Columns.** The different columns in the System Alarm List are described in [Columns](#).

**Context Menu.** You can right-click on an alarm line to bring up the context menu, for more information see [Context Menu](#).

### **Acknowledge**

See [Acknowledge](#) on page 106.

### **Silence Audible Alarm and External Alarm**

See [Silence Audible Alarm and External Alarm](#) on page 108.

### **Working within a System Alarm List**

Operator activities describing how to work with a System Alarm List are described in [Working within a Process Alarm List](#) on page 111.

### **Print**

See [Print](#) on page 120.

### **Moving System Alarm Data to other Applications**

See [Moving Process Alarm Data to other Applications](#) on page 121

### **Hidden System Alarms**

See [Hidden Process Alarms](#).

### **Shelved System Alarms**

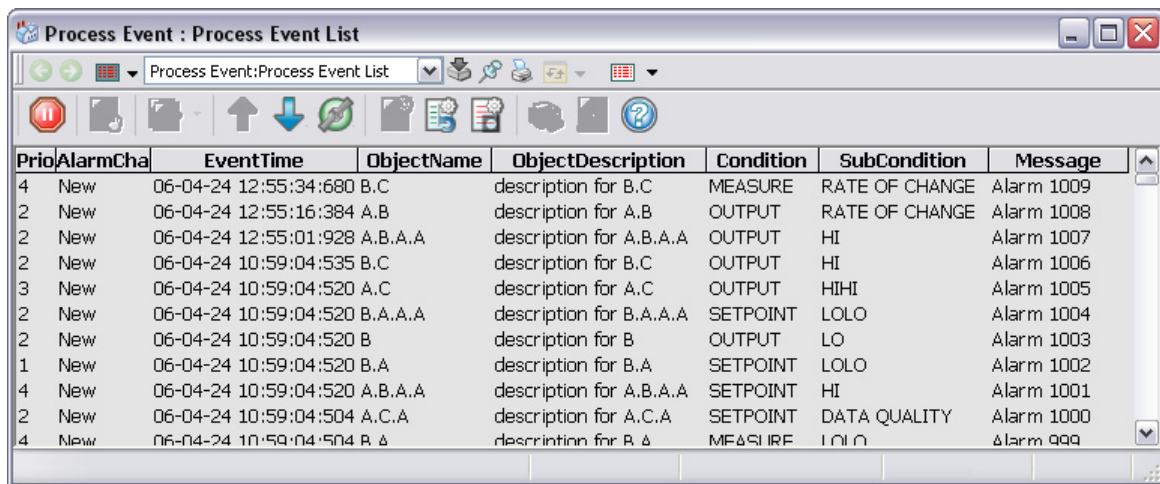
Refer to [Shelved Process Alarms](#).

## Process Events

### Process Event List

#### Accessing and Reading

To access a Process Event List for an object click the Process Events List button in the Tool Bar (see [Figure 10](#)).



Prio	AlarmCha	EventTime	ObjectName	ObjectDescription	Condition	SubCondition	Message
4	New	06-04-24 12:55:34:680	B.C	description for B.C	MEASURE	RATE OF CHANGE	Alarm 1009
2	New	06-04-24 12:55:16:384	A.B	description for A.B	OUTPUT	RATE OF CHANGE	Alarm 1008
2	New	06-04-24 12:55:01:928	A.B.A.A	description for A.B.A.A	OUTPUT	HI	Alarm 1007
2	New	06-04-24 10:59:04:535	B.C	description for B.C	OUTPUT	HI	Alarm 1006
3	New	06-04-24 10:59:04:520	A.C	description for A.C	OUTPUT	HIHI	Alarm 1005
2	New	06-04-24 10:59:04:520	B.A.A.A	description for B.A.A.A	SETPOINT	LOLO	Alarm 1004
2	New	06-04-24 10:59:04:520	B	description for B	OUTPUT	LO	Alarm 1003
1	New	06-04-24 10:59:04:520	B.A	description for B.A	SETPOINT	LOLO	Alarm 1002
4	New	06-04-24 10:59:04:520	A.B.A.A	description for A.B.A.A	SETPOINT	HI	Alarm 1001
2	New	06-04-24 10:59:04:504	A.C.A	description for A.C.A	SETPOINT	DATA QUALITY	Alarm 1000
4	New	06-04-24 10:59:04:504	B.A	description for B.A	MEASURE	LOLO	Alarm 999

Figure 96. Process Event List with default Columns

**Columns.** The different columns in the Process Event List are described below:

- **AckState** - shows if the alarm that caused the event is acknowledged or not.
- **AckTime** - acknowledge time for the alarm that caused the event.
- **ActiveTime** - shows the time when the alarm that caused the event was generated.
- **Actor** - shows who acknowledged the alarm that caused the event.

- **AlarmChange** - shows information about the condition change that caused the event to be generated. For example the alarm became inactive, alarm was acknowledged, or a comment was added.
- **AlarmState** - shows the state of an event by means of a comprehensive abbreviation which can have one of the following values (in precedence order):
  - MBL = Manually blocked, also known as Disabled
  - ABL = Automatically blocked, also known as AutoDisabled or BlockedRepetitive
  - HID = Hidden
  - ACT = Active
  - RTN = Inactive (Return-to-normal)
- **AutoDisabled** - specifies whether the alarm that caused the event has been autodisabled or not (True/False), or blank if autodisabling is not supported.
- **Category** - grouping of alarms.
- **Class** - classification of the area that caused the event.
- **Comment** - shows comments added to the event.
- **Condition** - name of the condition.
- **CurrentValue** - value of the signal related to the alarm condition.
- **EnableState** - shows if the alarm that caused the event is disabled or not.
- **EventTime** - shows the most recent change of state for the alarm that caused the event.

#### Feature Pack Functionality

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- **GroupAlarm** - indicates if the alarm is a group alarm.
- **GroupAlarmIds** - shows the Alarm Groups in which the alarm condition is included, in the format <GUID>:<GUID>.
- **GroupAlarmNames** - shows the Alarm Group names in which the alarm condition is included.



For **GroupAlarmIds** and **GroupAlarmNames**, the presentation of an array in the corresponding columns of the Alarm or Event details dialog is a comma separated list of entries.

- 
- **Hidden** - shows if the event is hidden or not.
  - **HidingMaskCondition** - shows the hiding mask condition if the event is hidden.
  - **HidingMaskName** - shows the hiding mask name if the event is hidden
  - **HidingRuleCondition** - shows the hiding rule condition if the event is hidden.
  - **Message** - short description of the event.
  - **ObjectDescription** - description of the concerned function/component.
  - **ObjectName** - the concerned function/component name, node name or both.
  - **Priority Level** - priority level of the alarm message that caused the event with 1 being the most important, (1=Critical, 2=High, 3=Medium, 4=Low).
  - **Quality** - quality associated with the alarm that caused the event.
  - **Severity** - shows OPC severity.
  - **Shelved** - indicates if the alarm is shelved.
  - **ShelvingMode** - shows the type of mode used to shelve the alarm (normal/one-shot).
  - **ShelvingReason** - shows the reason for which the alarm was shelved.
  - **ShelvingTime** - shows the time at which the alarm was shelved.
  - **ShelfExpireTime** - shows the time at which the alarm will no longer be shelved.
  - **SourceName** - name of the object that caused the event.
  - **SubCondition** - shows if a subcondition is reached.



Additional columns can occur depending on OCS Integration Packages used.

**Context Menu.** Right-click on an event to bring up the context menu where you can perform some actions on this event line, see [Figure 97](#).

Using the context menu you can also e.g. perform some actions on the event list or access any aspect of the object in event state.

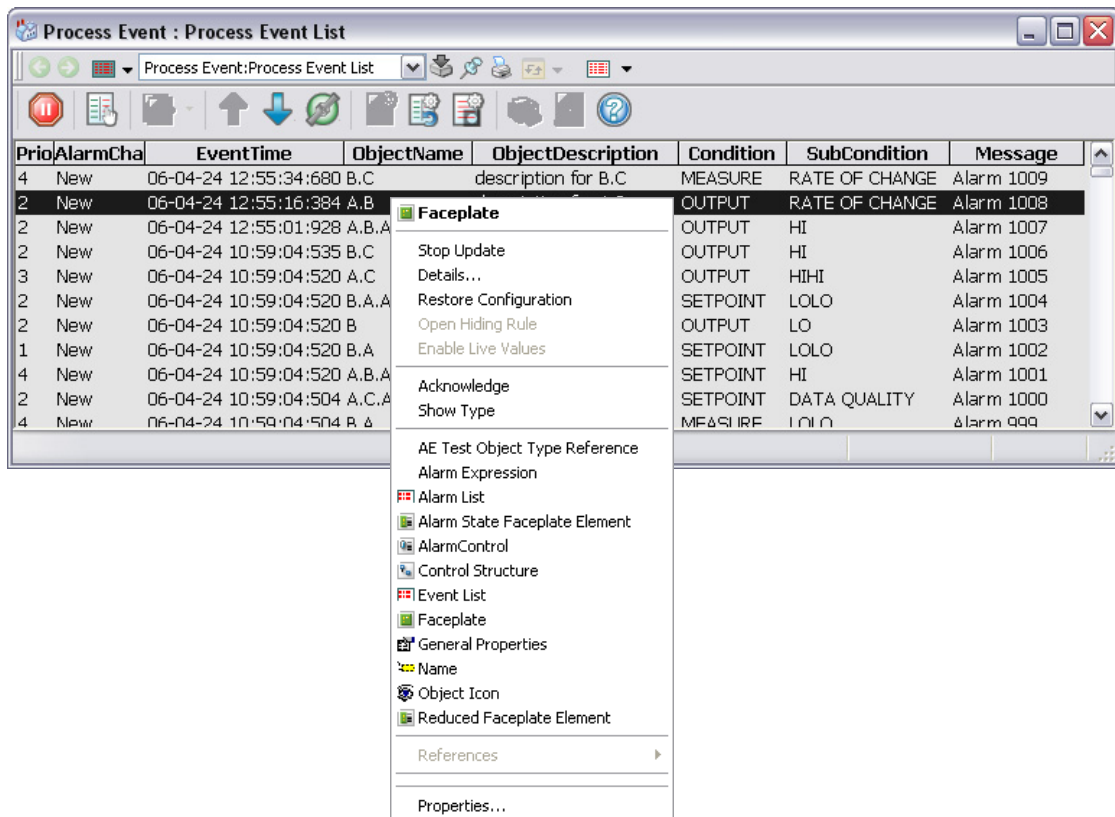


Figure 97. Context Menu for a Process Event

### Working within a Process Event List

Operator activities describing how to work with a Process Event List are described below.



In disconnected mode, data between the event servers are not replicated. When the event servers are back in connected mode they might not contain the same data, i.e the event lists with the same configuration on the different nodes do not contain the same events. For the event servers to be identical again and the event lists to contain the same events, contact your system administrator.

**Process Event List Tool Bar.** Below are the different tools in the Process Event List Tool Bar described:

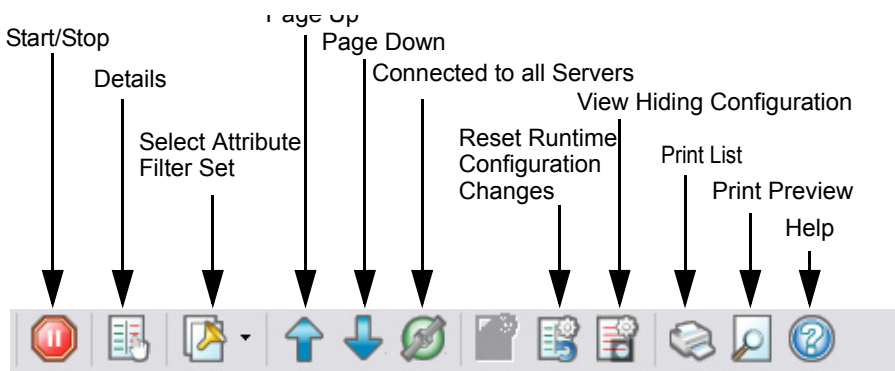


Figure 98. Process Event List Tool Bar

- **Start/Stop** - You can start, restart or stop list updates using the **Start/Stop** button.
- **Details** - Click the **Details** button to see extended information about the selected event.
- **Select attribute filter set** - Click the button if you want to remove the current filter. Click the drop-down menu if you want to select a predefined attribute filter. If a filter is selected, this will be indicated between the toolbar and the event list.



- **Page Up** - If you click the **Page Up** button the previous 500 events will be shown in the list.
- **Page Down** - If you click the **Page Down** button the next 500 events will be shown in the list.
- **Connected to all Servers** - Click the **Connected to all Servers** button to view the System Status Viewer. For more information about the System Status Viewer refer to *System 800xA, Administration and Security (3BSE037410\*)*.
- **Reset Runtime Configuration Changes** - If you have made changes to the event list, for example moved columns, you can restore the initial view by using the **Reset Runtime Configuration Changes** button.
- **View Hiding Configuration** - Click the **View Hiding Configuration** button to view the Hiding Mask Manager. See *System 800xA, Operations, Operator Workplace Configuration (3BSE030322\*)* for more information.
- **Print List** - See [Print](#) on page 120.
- **Print Preview** - See [Print](#) on page 120.
- **Help** - Click the **Help** button if you want to read about things regarding the event list in the On-line Help.

**Marking and Selecting Rows.** See [Marking and Selecting Rows](#).

**Sizing Columns and Rows.** See [Sizing Columns and Rows](#).

**Sorting Columns.** See [Sorting Columns](#).

**Moving Columns.** See [Moving Columns](#).

**Filtering Columns.** See [Filtering Columns](#).

#### **Print**

See [Print](#) on page 120.

### Moving Process Event Data to other Applications

See [Moving Process Alarm Data to other Applications](#) on page 121.

## System Events

### System Event List

#### Accessing and Reading

There are several ways to access a System Event List for an object. The following are some typical examples that may be configured:

- from an Event Line in the Application Bar using the context menu
- from the System Event List button in the Tool Bar (see [Figure 10](#)).

Prio	AlarmCha	EventTime	ObjectName	Condition	Message	NodeName
2	Inactive	06-04-24 13:34:10:039	Time_Basic_SEVST-W-0002389	Inoperative	Service Provider in Operational	
1	Inactive	06-04-24 13:34:10:039	Basic	Inoperative	Service in Operation	
4		06-04-24 13:34:10:039	Time_Basic_SEVST-W-0002389		Service provider reached servi	SEVST-W-0002389
4		06-04-24 13:34:08:806	Time_Basic_SEVST-W-0002389		Service provider started	SEVST-W-0002389
3		06-04-24 13:34:08:712	Time_Basic_SEVST-W-0002389		Service provider stopped	SEVST-W-0002389
2	New	06-04-24 13:34:08:697	Time_Basic_SEVST-W-0002389	Inoperative	Service Provider not in Operati	
1	New	06-04-24 13:34:08:697	Basic	Inoperative	Service out of Operation	
1	Inactive	06-04-24 13:33:53:226	ABB 800xA Soft Alarms Server	Inoperative	Service in Operation	
1	Inactive	06-04-24 13:33:53:148	ABB 800xA System Message Ser	Inoperative	Service in Operation	
1	Inactive	06-04-24 13:33:52:883	TestServer	Inoperative	Service in Operation	
4		06-04-24 13:33:51:446	Soft Alarms Basic SEVST-W-00		Provider requests automatic sv	

Figure 99. System Event List with default Columns

**Columns.** The different columns in the System Event List are described in [Columns](#).

**Context Menu.** You can right-click on an event line to bring up the context menu, for more information see [Context Menu](#).

**Working within a System Event List**

Operator activities describing how to work with a System Event List are described in [Working within a Process Event List](#) on page 132.

**Filtering Columns.**

See [Filtering Columns](#).

**Print**

See [Print](#).

**Moving System Event Data to other Applications**

See [Moving Process Alarm Data to other Applications](#) on page 121.



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## Section 7 Trends

The Trend Display can present data seamlessly from both run-time and historical data. When a Trend Display for an object is selected all available data can be viewed through the trend. This also means that it is possible to move the time range back and forth without worrying about where data is coming from provided that the seamless function is enabled in the Trend Display.

The Trend Display can hold a number of Trend Traces and it is possible to trend any numerical property. It is possible to insert new traces for comparison with the existing in all trends but the modified trend can only be saved if it is an Operator Trend.

Functions for rulers, time zooming, magnifying glass etc. are available in the Trend Display. The time-offset function can be used to trace a signal in real time and compare it with values from yesterday. It is possible to present trend relationship between two values as XY plots.

### Accessing Trend Display

Three possible ways to access a Trend Display for an object are:

- From a shortcut in the Application Bar
- From the context menu.
- From the faceplate extended view.

### Print Trend Views

To print a Trend Display click the **Print Aspect View** button in the Display Bar, or use the **Print Trend** button from the Trend Tool Bar if you are using the Top or Main Views.

The **Print Trend** button will only print the trend area and trend table. It will maximize the window before making the screen shot of the trend area and also scale the contents of the Trend Table so that it all fits on a single piece of paper.

The **Print Screen** button in the Application Bar (see [Figure 10](#)) will give you a screenshot of the Trend Display with the Operator Workplace in the background. The screenshot will be printed on a default local or network printer.

## Trend Display Layout

There are four different layouts for the trend display:

- The standard layout, this is the Main View ([Figure 100](#)).
- The same as above but with the Trend Table on top, this is the Top View ([Figure 101](#)).
- There is also a layout where the Trend Table and Trend Tool Bar are replaced with an Item Area to the left, a Top Tool Bar and a Bottom Tools Bar, this is the Left View ([Figure 102](#)).
- The same as above also exist with the Item Area to the right, this is the Right View ([Figure 103](#)).

The first two layouts are divided into three areas: the Trend Area, the Trend Tool Bar and the Trend Table, see [Figure 100](#).

The third and fourth layouts are divided into four areas: the Trend Area, the Top Tool Bar, the Bottom Tool Bar and the Item Area, see [Figure 102](#).

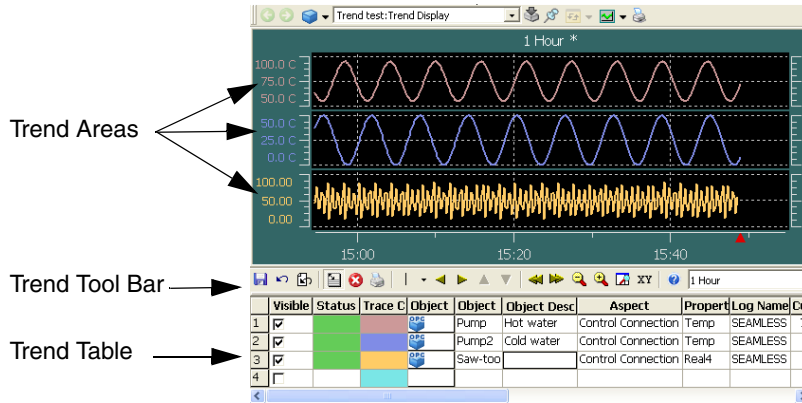


Figure 100. Trend Display Main View

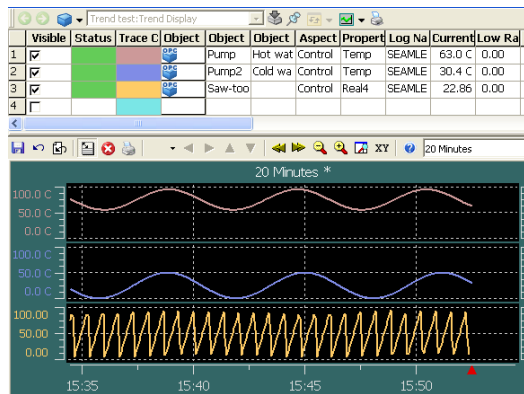


Figure 101. Trend Display Top View

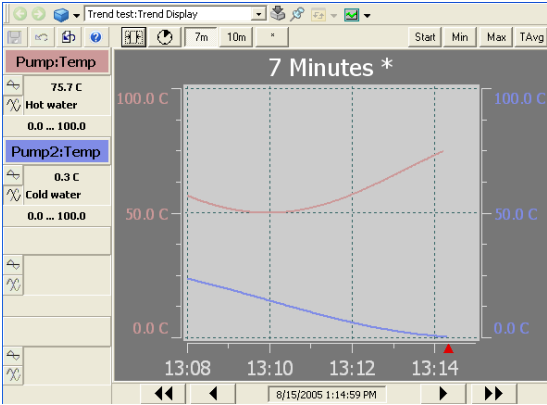


Figure 102. Trend Display Left View

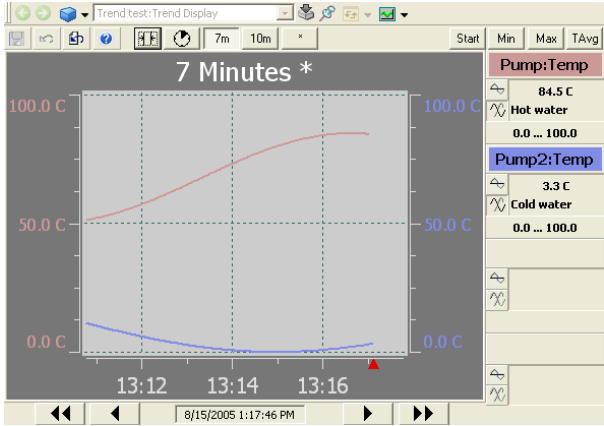
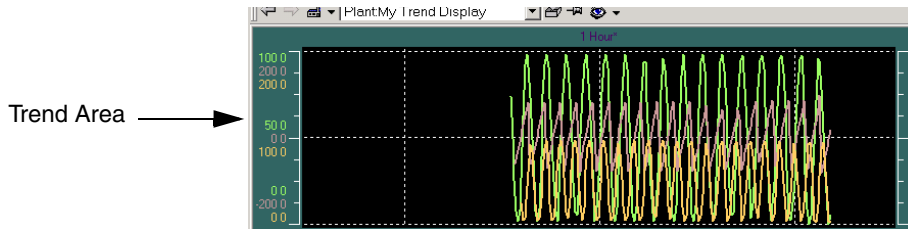


Figure 103. Trend Display Right View



## Trend Area

The Trend Area displays trend data as traces. See [Figure 104](#).



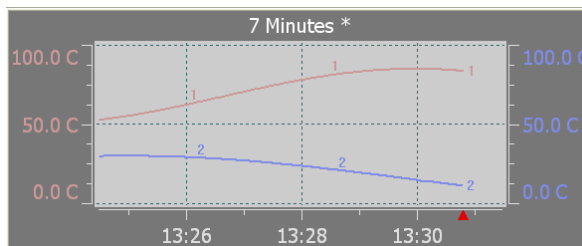
*Figure 104. Trend Area*

Different tools are provided to let you modify the view of the traces in a variety of ways. How you can modify traces and trend data are described in the following two sections; [Trend Tool Bar](#) on page 142 and [Trend Table](#) on page 153.

There is also a set of keyboard shortcuts that can be used to modify the Trend Area. These are described in [Table 9](#).

The Trend area is edge (border) sensitive. If you click the mouse in the trend area and drag it over the grid edge, the Trend Area starts to scroll in that direction.

Each trace can have its number drawn in the Trend Area to help identify the different traces. The number can be drawn above, below or centered on the trace. When right clicking in the Trend Area a pop-up menu is displayed which lets you configure this. Please note that this also can be configured on the Trend Template.



*Figure 105. Trace Identification*

## Trend Tool Bar

The Trend Tool Bar contains buttons for frequently used functions to operate the Trend Display. See [Figure 106](#).

The Trend Tool Bar lets you, among other things:

- freeze the graphical view in time. See [Block/Unblock](#).
- select a point on the graphical view, and then read the corresponding times and values for each trace. See [Move Ruler](#).
- pan the Trend Area left and right. See [Move Scope](#).
- zoom in to see greater detail, and zoom out to see a wider time scope. See [Zoom in/out](#).

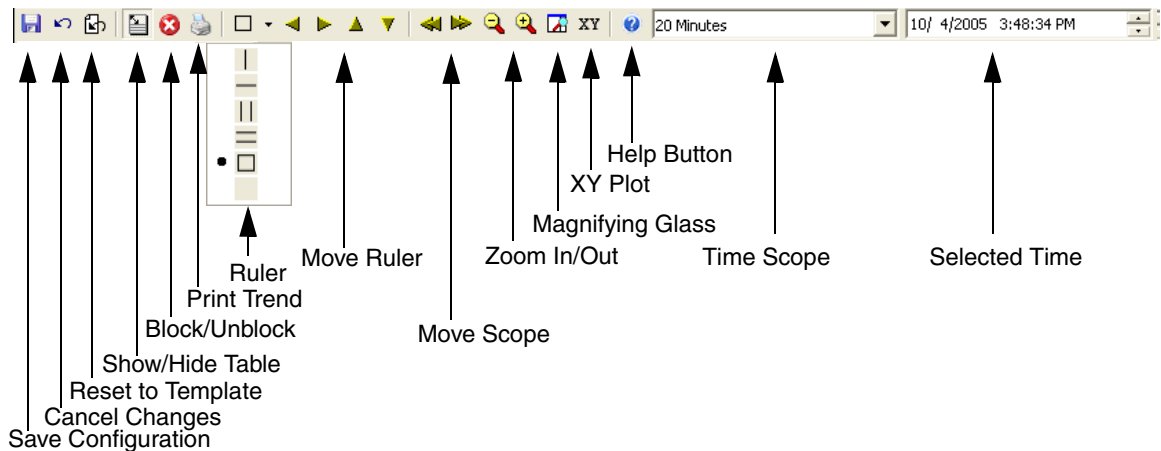



Figure 106. Trend Tool Bar


- **Save Configuration** 


The **Save** button is enabled when changes to the trend configuration have been made. Depending on your permissions you can save the changed configuration.

- **Cancel Changes** 

The **Cancel Changes** button cancels all unsaved changes in the Trend Display view. Note that not all changes can be canceled.



- **Reset to Template** 


The **Reset** button resets all applicable data in the Trend Display configuration to the default read from the template configuration. That means that a change to the Trend Template takes effect in the Trend Display when clicking the **Reset** button. Note that you can lose earlier saved changes.
- **Show/Hide Table** 

The **Show/Hide Table** button shows or hides the Trend Table. When the button is pressed the table is visible. When the table is hidden, it is replaced by a small table, showing trace colors and logged object in the form object: property, log name. This state is part of the configuration and can be saved with the **Save** button.
- **Block/Unblock** 

The **Block/Unblock** button toggles the updating of the graphical view. A pressed button means the graphical view updating is stopped. By clicking the button again the view is unblocked.

The following operator actions also cause the graphical view to be blocked:

  - moving scope in any direction
  - zooming
  - changing in the **Selected Time** area in the Trend Tool Bar.
- **Print Trend** 
  - The **Print Trend** button prints the trend display and the contents of the Trend Table. It will maximize the window before making the screen shot and scale the Trend Table so that all information fits on one page.
- **Select Ruler** 


See [Rulers](#) on page 162.
- **Move Ruler** 

See [Rulers](#) on page 162.

- **Move Scope** 

Use the **Move Scope** left/right buttons, to pan the graphical view in the selected direction. The buttons move the scope by 25% of the current time scope.

The panning blocks the trend updating. Another way to move the scope is to select the vertical ruler and move it outside the grid with the mouse.

- **Zoom in/out** 

**Zoom in/out** buttons let you zoom in or zoom out around the center point of the scope. Zooming out increases the scope by 50%. Zooming in decreases the scope by a third. The result of a zoom in followed by a zoom out or vice versa leaves the scope unchanged. Zooming can also be done by using the ruler.

- **Magnifying Glass** 

The **Magnifying glass** button toggles the magnifying glass mode.

It will set up the magnifying glass area with a default start and end time (about 20 percent centered), using 35 percent of the area for the magnifying glass.

To resize the magnifying glass area, position the pointer at the edge of the grey area. Click the left mouse button, move the pointer and release the mouse button. See [Figure 107](#). To move the magnifying glass area place the pointer at the center of the grey area and drag it to the right place.

The magnifying glass shows a dynamic view of the specified time scope. It does not move along with the time axis, which means that if you put it at the end of the time scope, the magnifying glass area will continually show the latest values.

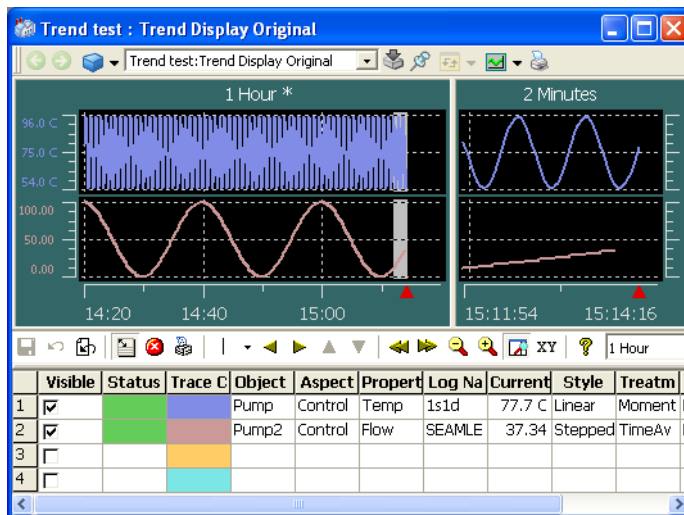



Figure 107. Magnifying Glass Area

- **XY Plot** 

See [XY Plot](#) on page 168.

- **Help Button** 

Use the **Help** button if you want to read about things regarding the Trend Display in the On-line Help.

- **Time Scope** 

You select the **Time Scope** for the Trend Display in the drop-down menu. The default value comes from the Trend Template. It is possible to write a time scope direct to the drop-down menu. The units available are year, month, day, hour, minute and second in any combination.

If a new scope is entered, the scope is added to the list of available scopes in the drop down menu. These changes to the configuration are possible to save.

Note that if the user has changed the scope by zooming, the actual scope may not correspond to the scope displayed by the drop-down menu.

- **Selected Time**

As an alternative, you can navigate forward and backward in time by specifying the date and time of the center point in the Trend Area. To change time, click on the field you want to change (hours, minutes, seconds, day, month or year) and do in one of these three ways:

- use the keyboard up/down arrows
- use the up/down arrows to the right in the field
- write value from keyboard.

### Keyboard Functions

Some of the functions in the Trend Tool Bar can be made with typing letters on the keyboard. Note that the Trend Area must be active for this function to work, see [Table 9](#).

*Table 9. Keyboard functions in Trend Display*

Button	Description
I	Zoom in
O	Zoom out
A	Toggle between area zoom and vertical ruler.
P	Toggle between normal and X/Y plot mode
G	Toggle between normal and looking glass mode
Q	Removes the ruler
N	Sets auto scroll on
R	Resets Y zoom
L	Clears trim curves and redraws trend
Z	Toggle between ruler and zoom mode
X	Toggles mode between vertical ruler and horizontal ruler, or between vertical zoom and horizontal zoom

Table 9. Keyboard functions in Trend Display (Continued)

Button	Description
C	Removes the ruler
Q	Removes the ruler
Shift-Ctrl-C	Puts data on clipboard with full time resolution
B	Toggle between Y buffer and order draw
H	Displays Trend Keyboard Help
M-B	Toggle between bad data mode Nothing and Dashed
M-D	Toggle between draw mod, Linear, Stepped, Filled and Point
M-I	Toggle between item draw mode
Ctrl-C	Puts data on clipboard
<Delete>	Removes the ruler
<Back>	Removes the ruler
<Escape>	Removes the ruler
Shift<Left>	Scrolls left
<Left>	Moves ruler left
Shift<Right>	Scrolls right
<Right>	Moves ruler right
<Up>	Moves horizontal ruler up
<Down>	Moves horizontal ruler down
<Space>	Executes operation performed using the keyboard
<Enter>	Executes operation performed using the keyboard

## Top Tool Bar

The top tool bar is part of the Left and Right Trend Display views. It is used to:

- Save and Cancel changes.
- Reset to the settings in the Trend Template.
- Bring up on-line help.
- Reset zoom and time scope.
- Select the length of the visible time scope.
- Select what aggregate to use.

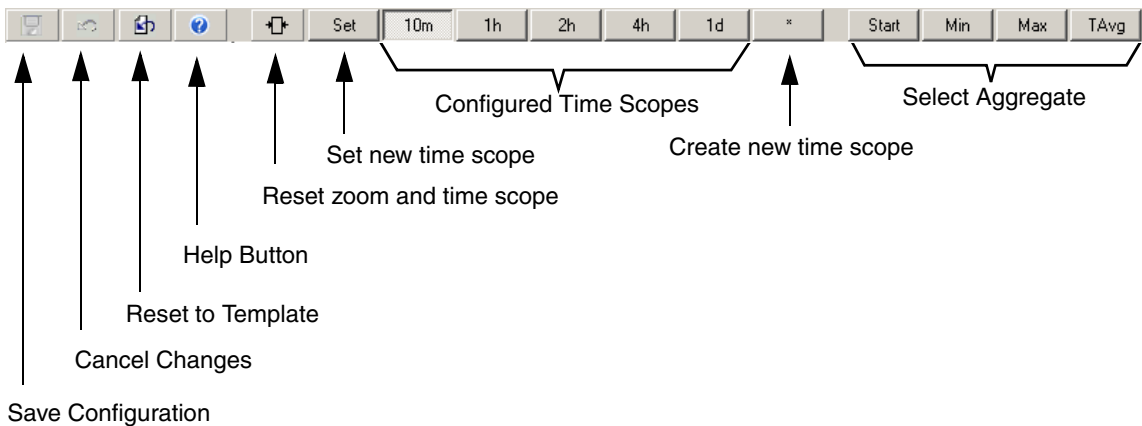


Figure 108. Top Tool Bar

- **Save Configuration** 

The **Save** button is enabled when changes to the trend configuration is made. Depending on your permissions you can save the changed configuration. Note that not all changes can be saved.

- **Cancel Changes** 

The **Cancel Changes** button cancels all unsaved changes in the Trend Display view. Note that not all changes can be canceled.



- **Reset to Template** 

The **Reset** button resets all applicable data in the Trend Display configuration to the default read from the template configuration. That means that a change to the Trend Template takes effect in the Trend Display when clicking the **Reset** button. Note that you can lose earlier saved changes.

- **Help button** 

Use the **Help** button if you want to read about things regarding the Trend Display in the On-line Help.

- **Reset Zoom and Time scope button** 

Use the **Reset Zoom and Time scope** button if you want to return to the original zoom and time scope.

- **Set new Time Scope button** 

The **Set new Time Scope** button opens a Time Scope selection dialog box where you enter the length of the time scope that you want to view. Please note that this time scope can not be saved. If you want to define a new selectable time scope you should use the **Create new Time Scope** button instead.

- **Select Time Scope buttons** 

The **Select Time Scope** buttons are used to switch between configured time scopes. New time scopes are added by pressing the **Create new Time Scope** button.

- **Create new Time Scope button** 

The **Create new Time Scope** button opens a Time Scope selection dialog box where you enter the length of the time scope that you want to view. This new time scope is then added to the selectable time scopes. Please note that there can not be more than six selectable timescopes.

- **Select Aggregate buttons** 

The **Select Aggregate** buttons are used to select which aggregate to use when drawing the traces. If an aggregate is selected it is used for all traces. The selectable aggregates are:

- Start

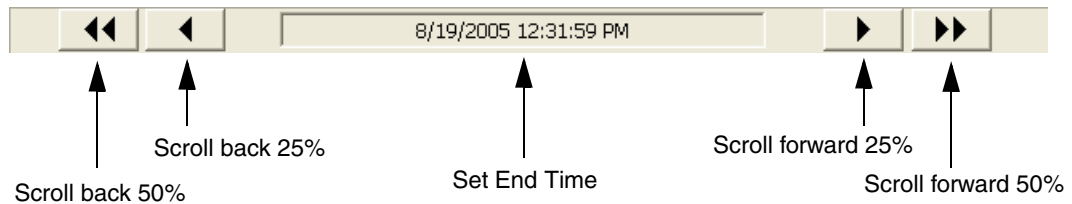
- Min
- Max
- Time Average

If no aggregate is selected the ones configured in the Trend Table on the Main View are used. To deselect a selected aggregate you just press the button one more time.

## Bottom Tool Bar

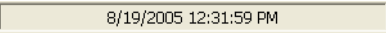
The bottom tool bar is part of the Left and Right Trend Display views. It is used to:

- Scroll forward and backward in time.
- Select the end time.




*Figure 109. Top Tool Bar*


- **Scroll back 50%** ◀◀  
Use the **Scroll back 50%** button, to move the scope back by 50% of the current time scope.  
The panning blocks the trend updating. Another way to move the scope is to select the vertical ruler and move it outside the grid with the mouse.
- **Scroll back 25%** ◀  
Use the **Scroll back 25%** button, to move the scope back by 25% of the current time scope. The panning blocks the trend updating. Another way to move the scope is to select the vertical ruler and move it outside the grid with the mouse.

- **Set End Time field** 

The **Set End Time** field shows the current end time in the trend display. Please note that if a Vertical Ruler is active the ruler time is shown instead. If a Horizontal ruler is active the time of the last place that the left mouse button was pressed is shown.

By left clicking in the field an End Time selection dialog box is opened that allows you to select a new end time. Selecting a new end time blocks the trend updating.
- **Scroll forward 25%** 

Use the **Scroll forward 25%** button, to move the scope forward by 25% of the current time scope.

The panning blocks the trend updating. Another way to move the scope is to select the vertical ruler and move it outside the grid with the mouse.
- **Scroll forward 50%** 

Use the **Scroll forward 50%** button, to move the scope forward by 50% of the current time scope.

The panning blocks the trend updating. Another way to move the scope is to select the vertical ruler and move it outside the grid with the mouse.

## Item Area

The Item Area is part of the Left and Right views. It is used to configure which traces to show and where.

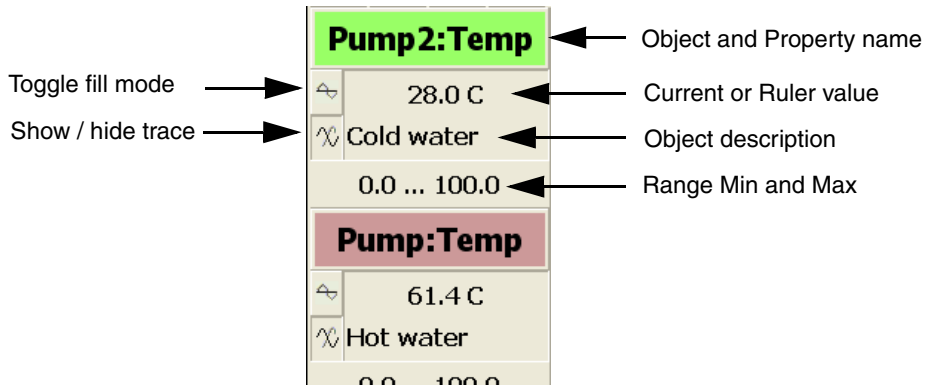




Figure 110. Item Area

- Object and Property name** **Pump2:Temp**  
 This part shows the object and property name. If a specific log is configured to be used this is shown in the tool-tip for this area.
- Current or Ruler value** 28.0 C  
 This area shows the current value, if not a vertical or horizontal ruler is active in which case the ruler value is shown instead.
- Object description** Cold water  
 This area shows the object description if available.
- Range Min and Max** 0.0 ... 100.0  
 This area shows the Range Min and Range Max values.
- Toggle fill mode**   
 This button toggles fill mode on or off.
- Show / hide trace**   
 This button toggles the visibility of the trace on or off.

## Trend Table

It is possible to adjust the size of the Trend Area and the Trend Table to your preference. Drag the Split Bar, which is located between the Trend Tool Bar and the Trend Table, to the desired position. It is possible to enlarge the Trend Table until all rows are visible but not further. The Split Bar does not affect the Trend Tool Bar.

The columns in the Trend Table are used for modifying the appearance of the traces in the Trend Display. The different columns are described below.

Note that if the Trend Display is inherited, the modification is not possible to do without selecting the Trend Display aspect with the right mouse button, and then selecting **Override** from the pop-up menu.

You can make some adjustments to a trace on a Trend Display using:

- [Showing/Hiding Traces](#)
- [High and Low Range](#)
- [Time Offset](#). Apply a time offset to a trace to facilitate comparison of different traces.
- [Filtering](#). Apply a low-pass filter to remove noise from a signal.
- [Changing the Trace Style](#)
- [Pair Property](#). Make an XY Plot between two traces.

Having made changes to the Trend Display, you can either save the changes or revert back to the previous configuration, by using the **Save Configuration** button or the **Cancel Changes** button, which you can find in the Trend Tool Bar.

		Icon	Object	Aspect	Property	Log Name	Current Value	Ruler Value	Ruler Time	Time Offset	Filter	Style
1	<input checked="" type="checkbox"/>		value_gen	Program	Bas_C5_Sa	Log1_1s_1h	233.33			00:00:00 00	0.00	Linear
2	<input checked="" type="checkbox"/>		value_gen	Program	Bas_C5_Sa	Log1_1s_1h	233.33			00:00:00 00	0.00	Linear
3	<input checked="" type="checkbox"/>		value_gen	Program	Bas_C5_Sa	Log1_1s_1h	233.33			00:00:00 00	0.00	Linear
4	<input checked="" type="checkbox"/>		value_gen	Program	Bas_C5_Sa	Log1_1s_1h	233.33			00:00:00 00	0.00	Linear

Figure 111. Trend Table

## Columns

- **Row Number**

The **Row Number** is the index number for a specific trace in the Trend Display. Selecting this cell with the left mouse button highlights the entire row.

- **Showing/Hiding Traces**

The **Visible** column can alternately show or hide a trace in the Trend Area by marking or unmarking the check box.

- **Data Collection Status**

The **Status** column mainly shows the communication status. It shows different colors depending on the status of the data communication:

- Green or white - OK
- Blinking yellow - waiting for data
- Red - no communication with server

- **Trace Colors**

The **Trace Color** is set as you do a configuration of the Trend Template. It is possible to change the color for a trace by changing in the Trend Template configuration and clicking the **Reset to Template** push button in the Trend Tool Bar. Note that this will affect all Trend Displays using the same Trend Template.

- **Object Icon**

The **Object Icon** column shows the assigned object icon. If no icon is assigned to the object, the cell is empty. Clicking in this cell shows a dialog that allows you to implement an object.

- **Object Name**

The **Object Name** column is the name of the trend data source, for example: value\_gen.

An easy way to add an object in the **Object Name** column is to just drag the object from for example a structure into the column. You can also use relative paths for the object name, see [Trend Table Context Menu](#) on page 160 how to configure relative paths.

If the **Property** column is not part of the Trend Table, the object name can be written using the syntax “<Object Name>[:<Aspect>]:<property>[,<Log Name>]”, where Aspect and Log Name are optional.

It is possible to remove a trace by deleting the name in the Trend Table.

- **Object Description**

The **Object Description** column shows the description specified in the name aspect for the object.

- **Aspect**

The **Aspect** column shows the property aspect of the object. You can select the available property aspects of the object from a drop-down menu. If no aspect is selected the property column will show all the available properties on the object.

- **Property**

The **Property** column is the property where the trend data is collected from. For instance, if the data source is an analog input, the property VALUE can be selected. You can change the property by writing the property or select it from the drop-down menu. Note that for an unlogged property the trend will only be updated as long as the Trend Display is open.



By pressing **Shift** while opening the drop-down menu, only the logged properties are displayed.

- **Log Name**

The **Log Name** column shows what log is displayed for the object and property. A drop-down menu shows all available logs for the selected object and property. In addition to these, the TRIM and the SEAMLESS logs are available.

If the TRIM log is selected, the trend will subscribe to data directly from the source and a trace will be displayed with the values retrieved. If the SEAMLESS log is selected the data is fetched from different logs to match scope and treatment.

When the SEAMLESS log is selected make sure that the treatment setting matches the aggregate of the logs that you want data from. History data and runtime data are seamlessly integrated.

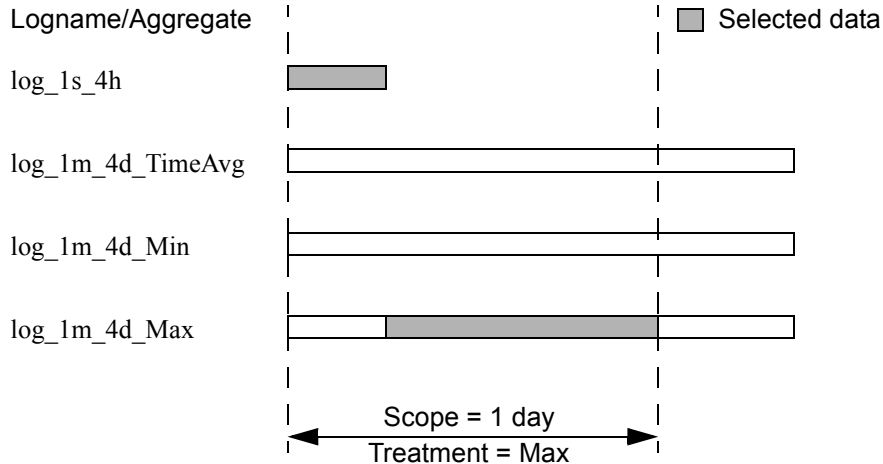


Figure 112. Example of Selection of SEAMLESS Data

For example: If you have a direct log that stores values every second for 4 hours, and three different hierarchical logs on the next level with TIMEAVERAGE, MIN, MAX aggregates. The trend has a scope of one day and the treatment set to MAX. The data would be fetched from the direct log for the first four hours and the rest of the data would be fetched from the MAX log.

- **Current Value**

The **Current Value** column shows the current value of the selected object property. The value is continuously updated even if the Trend Display is in blocked mode.

- **High and Low Range**

The **High** and **Low Range** columns are used for the Y-axis in the Trend Area. By default the range is between -100 to +100. You can change these ranges by typing another value or use the arrows.



A change of range can be saved for a Trend Display. The value 0 (zero) indicates that the range is inherited. The value range and engineering units can be configured.

- **Time Offset**

The **Time Offset** column can be used to delay one trace to make it easier to compare it with another. To do this, click the **Time Offset** field in the Trend Table, and then enter the offset time. The used format is yy:mm:dd HH:MM:SS.

- **Filtering**

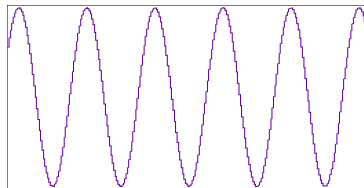
See [Filtering](#) on page 169.

- **Changing the Trace Style**

The **Style** column defines the trace form. The style is by default a continuous line. The traces can be viewed in Normal, Linear, Stepped, Point or Filled style.

The selection is done via the **Style** cell in the Trend Table. The Normal style is dependent on the data shown in the trace. In [Figure 113](#) both traces have linear style.

Below are examples of how Stepped (see [Figure 113](#)), Point (see [Figure 114](#)) and Filled (see [Figure 115](#)) presentations look like.



*Figure 113. Trace Style Stepped*

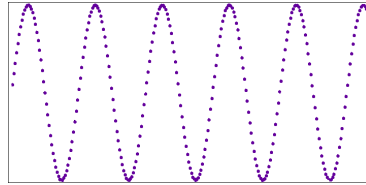


Figure 114. Trace Style Point

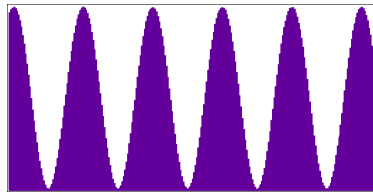


Figure 115. Trace Style Filled

- **Ruler Time**

The **Ruler Time** column indicates the time corresponding to the current ruler position (when the vertical ruler is active). Note that if a time offset has been applied to one or several traces, the times in this column will differ for each trace.

- **Ruler Value**

The **Ruler Value** column indicates the value for each trace corresponding to the current ruler position.

- **Treatment**

The **Treatment** column shows how the history server treats data before sending it to the Trend Display. A new value can be selected from the drop-down menu.

- **Mean Value**

The **Mean Value** column shows the average value of the current scope.

- **Extrapolate**

The **Extrapolate** column shows what type of extrapolation is selected. A new value can be selected from the drop-down menu (default is None).

The meaning of the selections are:

- *None*, no extrapolation of the trace value is done.
- *Value*, the trace is continued from the last point until current time with the same value as the last point.
- *Slope*, the trace is continued from the last point until current time with the same slope as between the two last points.

Extrapolate is useful for a fairly stable signal, especially for TRIM traces, since the Trend Display only retrieve new values if the value changes. Consider for example a constant signal viewed as a TRIM trace, the trace will be updated unless it is extrapolated.

- **Min and Max Value**

The **Min** and **Max Value** columns shows the minimum and maximum value of the current scope.

- **Pair Property**

The **Pair Property** column shows the index used for pairing XY Plot.

- **Property Description**

The **Property Description** column shows the description specified in the property aspect for the object.

## Context Menu

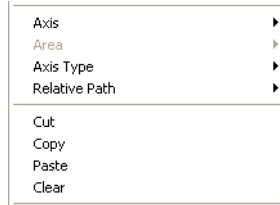
There are three different context menus for the Trend Display.

The first is shown when you right click the mouse on a row in the Trend Table (on the Main and Top Views), see [Figure 116](#).

The second is shown when you right click on an item in the Item Area (on the Left and Right Views), see [Figure 117](#).

The third is shown when right clicking on the Trend Area, see [Figure 118](#).

## Trend Table Context Menu



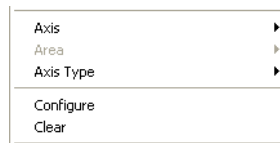
*Figure 116. Table Context Menu*

The Trend Table Context Menu contains the following trend specific functionality:

- **Axis**  
Lets you choose on which side of the Trend Area that the Axis for this trace should be placed, Left or Right.
- **Area**  
Lets you choose in which Trend Area the trace should be drawn. This function is dimmed if only one area is shown.
- **Axis Type**  
Lets you choose between linear and logarithmic scale for the trace.
- **Relative Path**  
Lets you choose whether or not to display the relative path in the Object Name column. Please note the relative path will only be displayed for objects configured using a relative path. There are two ways to configure a trace using a relative path. The first is to press Ctrl while performing a drag and drop operation to the trend area. The other is to directly write the relative path in the Object Name column. Please note that only descending objects can be configured using a relative path.
- **Cut**  
Clears the contents of the selected cell/row and places the contents on the clipboard.

- **Copy**  
Copies the contents of the selected cell/row and places the contents on the clipboard.
- **Paste**  
Pastes the contents of the clipboard to the selected cell/row.
- **Clear**  
Clears the contents of the selected cell/row.

## Item Area Context Menu



*Figure 117. Item Context Menu*

The Item Area Context Menu contains the following trend specific functionality:

- **Axis**  
Lets you choose on which side of the Trend Area that the Axis for this trace should be placed, Left or Right.
- **Area**  
Lets you choose in which Trend Area the trace should be drawn. This function is dimmed if only one area is shown.
- **Axis Type**  
Lets you choose between linear and logarithmic scale for the trace.
- **Configure**  
Opens a Property Selection dialog which lets you select what property to display and whether or not to show data from a specific log of that property.
- **Clear**  
Removes the property from the Trend Display.

## Trend Area Context Menu



*Figure 118. Trend Area Context Menu*

The Trend Area Context Menu contains the following trend specific functionality:

### Trace Identification

Each trace can have its number drawn in the Trend Area to help identify the different traces. The number can be drawn above, below or centered on the trace.

This is configured using this context menu

## Rulers

With the different rulers available in the Trend Table you can for example zoom in on a time interval as well as read the time and value for a specific time in the trace. To select a ruler click the **Ruler** button (see [Figure 106](#)). The button has a drop-down menu to select any of five different ruler styles, or a no ruler option. The ruler styles are vertical, vertical size, horizontal, horizontal size and area size.

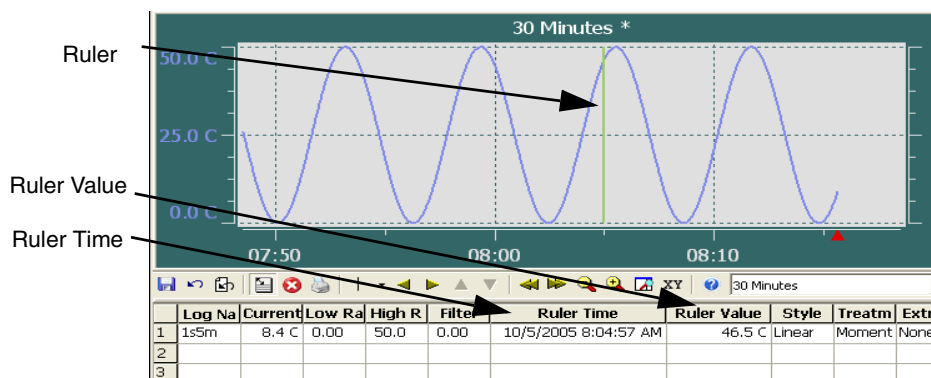
If you select the no ruler option from the drop-down menu, the ruler will be removed and the y-axis zooming will be reset. Only the applicable **Move** ruler buttons (see [Figure 106](#)) are available, depending on selected ruler. These buttons moves the ruler left, right, up or down.

Please note that you have to use the keyboard commands to select and move rulers if you use the Left or Right Views, see [Table 9](#).

## Vertical Ruler

The vertical ruler (see [Figure 119](#)) is used to read the value and time for a specific place in the trace. To use this ruler in the Main and Top View:

1. Select the vertical ruler in the **Select Ruler** drop-down menu or if it is selected click the ruler button in the Trend Tool Bar. This will place the ruler on the graphical view.
2. Select the ruler with the left mouse button, and then drag left or right. You can also move the ruler via the left/right arrow buttons in the Trend Tool Bar or use the keyboard left/right arrow keys.
3. Read the corresponding **Ruler Time** and **Ruler Value** in the Trend Table.



*Figure 119. Vertical Ruler*

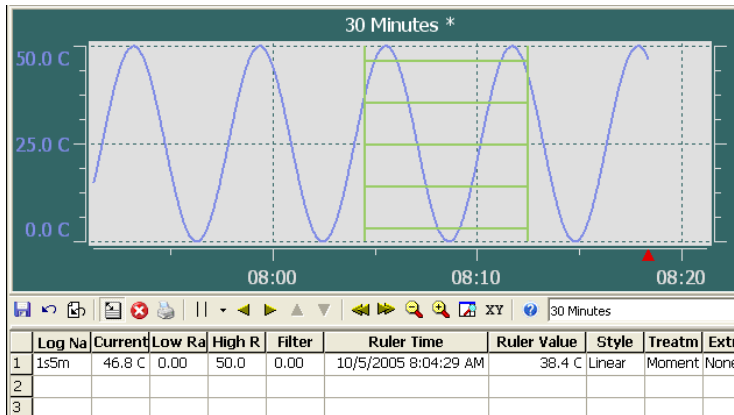
To use this ruler in the Left and Right Views:

1. To place a Vertical Ruler in the Trend Area you perform a left mouse click in the Trend Area where you want the ruler to be placed.
2. There are two ways to move the ruler. You can select it with the left mouse button and then drag it left or right, or you can use the left/right arrow keys on the keyboard.
3. The Ruler Time is found on the Bottom Tool Bar and the trace values at the ruler position are found in the Item Area.

## Vertical Size Ruler

The vertical size ruler (see [Figure 120](#)) is used to zoom in on a specific time interval. To use this ruler in the Main and Top Views:

1. Select the vertical size ruler in the **Select Ruler** drop-down menu or if it is selected click the ruler button in the Trend Tool Bar. This will place the ruler on the graphical view.
2. Select the ruler with the left mouse button, and then drag left or right.
3. Release the left mouse button.



*Figure 120. Vertical Size Ruler*

To use this ruler in the Left and Right Views:

1. Left click in the Trend Area to place a Vertical Ruler there.
2. Press the Z-key to change it to a Vertical Size Ruler.
3. Select the ruler with the left mouse button, and then drag left or right.
4. Release the left mouse button.

Please note that you also can use the left/right arrow keys to move the ruler, and then press the Enter key to complete the zoom operation.



## Horizontal Ruler

The horizontal ruler (see [Figure 121](#)) is used for reading a value.

To use this ruler in the Main and Top Views:

1. Select the horizontal ruler in the **Select Ruler** drop-down menu or if it is selected click the ruler button in the Trend Tool Bar. This will place the ruler on the graphical view.
2. Select the ruler with the left mouse button, and then drag up or down. You can also move the ruler via the up/down arrow buttons in the Trend Tool Bar or use the keyboard up/down arrow keys.
3. You can read the corresponding **Ruler Value** in the Trend Table.

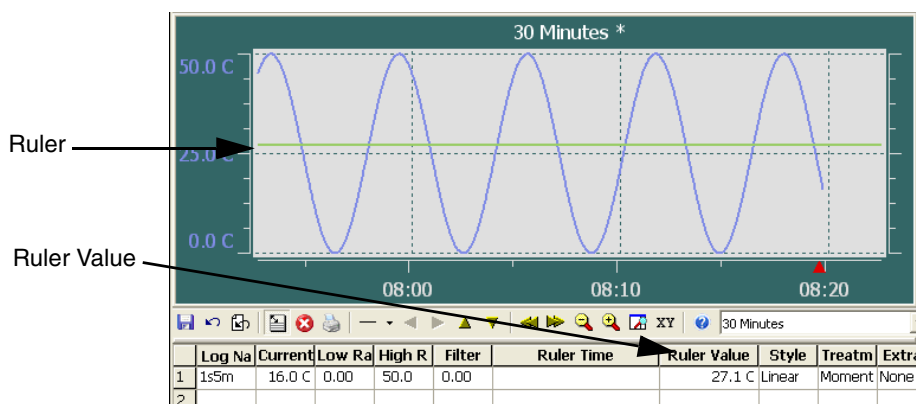


Figure 121. Horizontal Ruler

To use this ruler in the Left and Right Views:

1. To place a Horizontal Ruler in the Trend Area you perform a left mouse click in the Trend Area and then press the X-key.
2. There are two ways to move the ruler. You can select it with the left mouse button and then drag it up or down, or you can use the up/down arrow keys on the keyboard.

The trace values at the ruler position are found in the Item Area.

## Horizontal Size Ruler

The horizontal size ruler (see [Figure 122](#)) is used for zooming in on the vertical axis. To use this ruler in the Main and Top Views:

1. Select the horizontal size ruler in the **Select Ruler** drop-down menu or if it is selected click the ruler button in the Trend Tool Bar. This will place the ruler on the graphical view.
2. Select the ruler with the left mouse button, and then drag up or down.
3. Release the left mouse button.

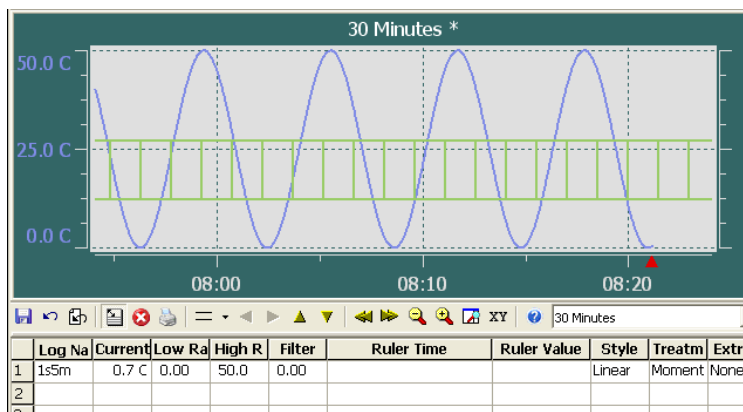


Figure 122. Horizontal Size Ruler

To use this ruler in the Left and Right Views:

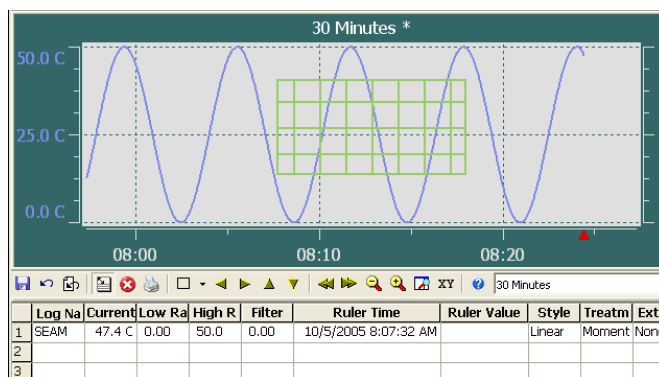
1. Left click in the Trend Area to place a Vertical Ruler there.
2. Press the X-key to change to a horizontal ruler.
3. Press the Z-key to change it to a Horizontal Size Ruler.
4. Select the ruler with the left mouse button, and then drag up or down.
5. Release the left mouse button.

Please note that you also can use the up/down arrow keys to move the ruler, and then press the Enter key to complete the zoom operation.

## Area Size Ruler

The area size ruler (see [Figure 123](#)) is used for zooming in an area. To use this ruler in the Main and Top Views:

1. Select the area size ruler in the **Select Ruler** drop-down menu or if it is selected click the ruler button in the Trend Tool Bar. This will place the ruler on the graphical view.
2. Select the ruler with the left mouse button, and then drag from upper left down to a lower right point.
3. Release the left mouse button.



*Figure 123. Area Size Ruler*

To use this ruler in the Left and Right Views:

1. Left click in the Trend Area to place a Vertical Ruler there.
2. Press the A-key to change to an area size ruler.
3. Left click where you want one of the corners for the new area, then drag the mouse to the opposite corner (diagonally).
4. Release the left mouse button.

Please note that you also can use the up/down and left/right arrow keys to select the area, and then press the Enter key to complete the zoom operation.

# Advanced Functions

## XY Plot

Two traces can be drawn in an XY Plot. One trace must be placed on the left axis and one trace on the right axis. The left axis corresponds to the Y-axis and the right axis corresponds to the X-axis (bottom axis). The beginning of the trace is darker than the end. There is also a marker on the end of the trace which size can be configured on the trend template. Note that it is allowed to use multiple left-axis traces to be drawn with one right/bottom axis trace.

To use the XY Plot (see [Figure 124](#)):

1. Set the **Pair Property** in the Trend Table. It is done by setting the same positive number in the pair property column for both curves.
2. Make sure that one trace is configured for the left axis and one for the right axis. Right-click on the desired trace number to bring up the context menu and select the left axis or right axis.
3. Click the **XY Plot** button.

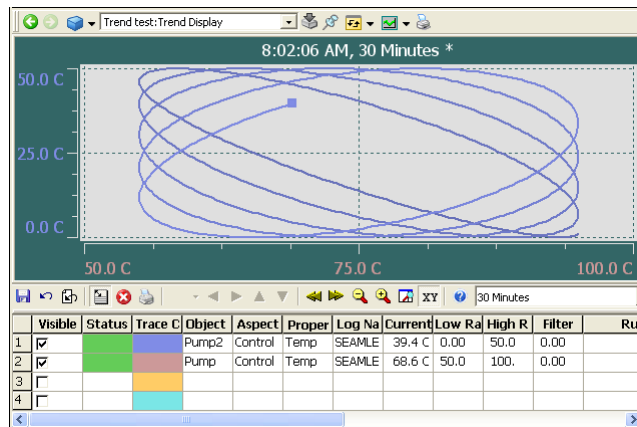


Figure 124. XY Plot

The background of the XY plot is changeable. Instead of having a black background, configurations made by an application engineer allows you to have for example a picture of standard curves to which you can compare the present curves in the XY plot.

## Filtering

The **Filter** column in the Trend Table is used to low-pass filter a trace for noise reduction.

The default is zero (0), indicating no filter. The value must be less than one and greater than or equal to zero. To edit, click in the cell and write a value or use the arrows.

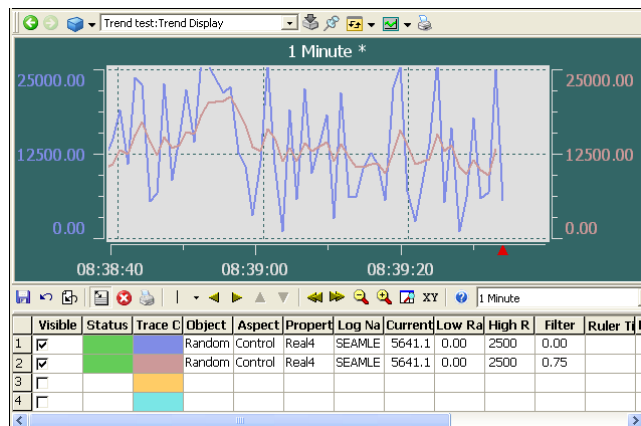


Figure 125. Trace Filtering

## Operator Trend Display

### How to Create an Operator Trend Display

To create an Operator Trend Display follow the steps below:

1. Click on the **Aspect Browser** button in the Application Bar.
2. Right-click on the object to which you want to add an Operator Trend Display. Select **New aspect**, see [Figure 126](#).

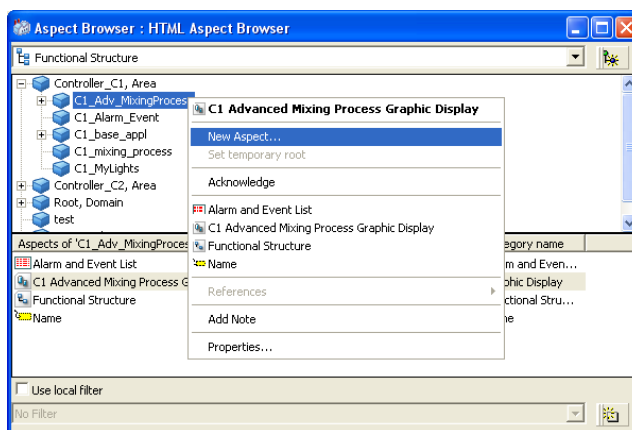


Figure 126. Create New Aspect

3. Select Operator Trend in the list, see [Figure 127](#), and give the new aspect a name.

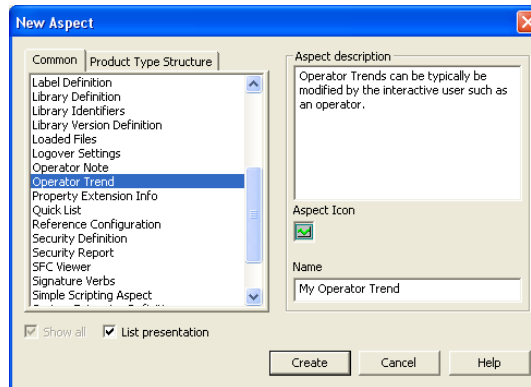


Figure 127. New Aspect - Operator Trend

4. Double-click on the new aspect in the aspect list to bring up the newly created Operator Trend Display, see [Figure 128](#) and [Figure 129](#).

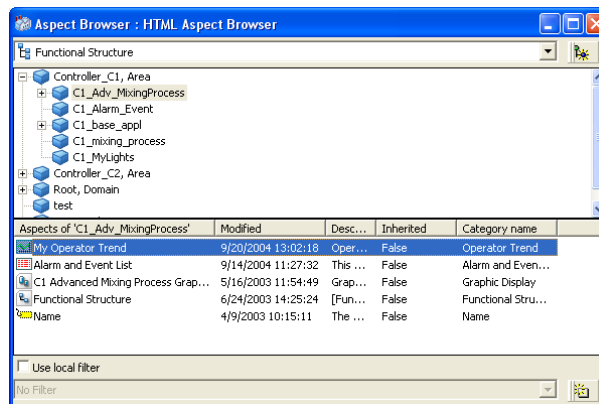


Figure 128. Operator Trend in the Aspect List

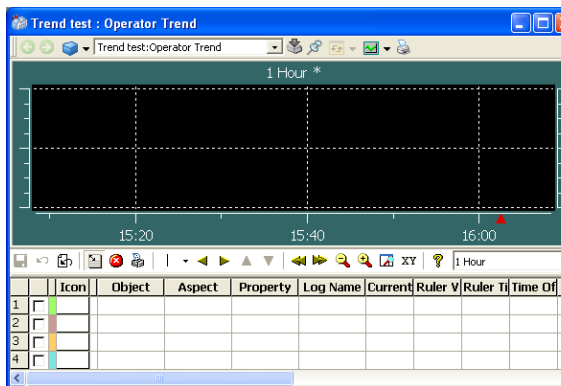


Figure 129. Operator Trend Display



To access your newly created Operator Trend Display in an easy way, add it to your favorites in the Trend Tool Bar. See [Favorites](#) on page 54.



You can make on-line changes in all Trend Displays but you can only save changes made to Operator Trends. You know that it is an Operator Trend if the **Save** button is enabled when you have made changes.

## How to Configure the Operator Trend Display

### Adding a Trace

You add a trace in this way:

1. Select the **Object Name** cell on an empty row in the Trend Table with the left mouse button.
2. Enter the name of an existing object or click on the button with three dots, see [Figure 130](#). Clicking this button displays a dialog, which lets you navigate in the structures to find an object.



	Visible	Status	Object Name	Property	Log Name	Current Value	Low Range	High Range	Ruler Time
1	<input type="checkbox"/>		...	▼					
2	<input type="checkbox"/>								
3	<input type="checkbox"/>								
4	<input type="checkbox"/>								

Figure 130. Adding a Trace

3. Select the **Property** cell on the same row.
4. Write a property or select it from the drop-down menu, see [Figure 130](#).

If the property column is not part of the Trend Table, it is possible to write the object name using the syntax “<object>:<property>”.



To add an object in an easy way you can drag an object from a Process Display and drop it into the **Object Name** column.

### Changing a Trace

You change a trace in this way:

1. Select the **Object name** of the trace you want to change.
2. Change the name by overwriting or click on the button with three dots to the right in the cell. Clicking this button displays a dialog which lets you navigate in the structures to find an object.
3. Select the **Property** cell on the same row.
4. Write a property or select it from the drop-down menu.

### Removing a Trace

You remove a trace in this way:

1. Select the **Object Name** cell for the trace you want to delete.
2. Delete the text and press **Enter**.

### Change Area or Axis

Click the right mouse button in a cell in the Trend Table for the trace you want to change area or axis for. Do changes in the context menu, see [Figure 131](#).

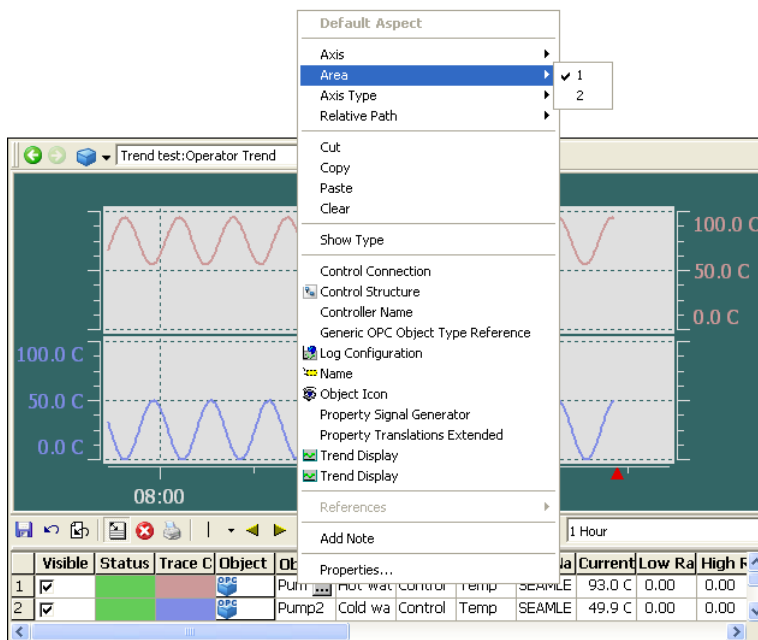


Figure 131. Change Area or Axis

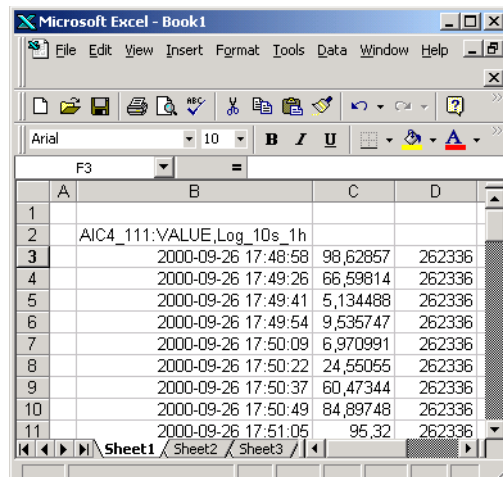
### Moving Trend Data to Other Applications

The capture data function lets you copy data from the Trend Area, and then paste the copied data into a third party software application such as Microsoft Excel. To do this:

1. Use zooming and move the scope to display the desired interval in the Trend Area.
2. Left click in the trace area of the Trend Area.

- Copy the data into the Windows paste buffer by pressing **Ctrl+c**. When using **Ctrl+c** the resolution of the time is seconds. For full resolution of the time press **Shift+Ctrl+c**.

Now you can paste the selected data to an external application (for instance, Microsoft Excel). Go to the external application and paste the data by pressing **Ctrl+v** or by using the paste function in the context menu. If the Trend Display is zoomed out you can not be sure to get the sampled data, instead it might be interpolated. An example of captured data being pasted into Microsoft Excel is shown in [Figure 132](#).



The screenshot shows a Microsoft Excel window titled "Microsoft Excel - Book1". The spreadsheet contains data for a trend labeled "AIC4\_111:VALUE\_Log\_10s\_1h". The data is organized into four columns: Column A (row numbers), Column B (timestamps), Column C (values), and Column D (status words). The data points are as follows:

	A	B	C	D
1				
2		AIC4_111:VALUE_Log_10s_1h		
3		2000-09-26 17:48:58	98,62857	262336
4		2000-09-26 17:49:26	66,59814	262336
5		2000-09-26 17:49:41	5,134488	262336
6		2000-09-26 17:49:54	9,535747	262336
7		2000-09-26 17:50:09	6,970991	262336
8		2000-09-26 17:50:22	24,55055	262336
9		2000-09-26 17:50:37	60,47344	262336
10		2000-09-26 17:50:49	84,89748	262336
11		2000-09-26 17:51:05	95,32	262336

*Figure 132. Pasted Captured Trend Data in Microsoft Excel*

The columns display time, value and status word for each point in the trace.



---

## Section 8 Reports

### Overview

It is possible to view an existing report or to run a report ad-hoc when needed. Activation is performed via normal ways of navigation like aspect links, shortcuts, favorites etc. It is also possible to get a print out of the report.

### Example Reports

*Table 10. Reports*

Name	Description	Parameters <sup>(1)</sup>
Hourly Log	1 hour log of 60 x 1 minute values	<ul style="list-style-type: none"><li>• Tag01 - Tag20 - List of tag names</li><li>• Tag01Algorithm - Tag20Algorithm - list of algorithms to be used for interpolation. Defaults to TimeAverage.</li><li>• Start - Time of first value to be displayed. Can be any valid Excel time format, for example: 8:30:00.</li><li>• DescriptionAtom - Tag atom of the description, for example: Description</li><li>• EUAtom - Tag atom of the engineering units, for example: Unit</li></ul> <p><b>Note:</b> if Start = 23:30:15 and the report is run on 2003/10/22, the values will start at 2003/10/21 23:30:15 and extend to 2003/10/22 00:29:15. For times &lt; 23:00:00 the report retrieves data for the current day.</p>

Table 10. Reports (Continued)

Name	Description	Parameters <sup>(1)</sup>
Shift Log	8 hour log of 32 x 15 minute values	<ul style="list-style-type: none"> <li>• Tag01 - Tag20 - List of tag names</li> <li>• Tag01Algorithm - Tag20Algorithm - list of algorithms to be used for interpolation. Defaults to TimeAverage.</li> <li>• Start - Time of first value to be displayed. Can be any valid Excel time format, for example: 8:30:00.</li> <li>• DescriptionAtom - Tag atom of the description, for example: Description</li> <li>• EUAtom - Tag atom of the engineering units, for example: Unit</li> </ul> <p><b>Note:</b> if Start = 23:30:15 and the report is run on 2003/10/22, the values will start at 2003/10/21 23:30:15 and extend to 2003/10/22 00:29:15. For times &lt; 23:00:00 the report retrieves data for the current day.</p>
Daily Log	1 day log of 24 x 1 hour values	<ul style="list-style-type: none"> <li>• Tag01 - Tag20 - List of tag names</li> <li>• Tag01Algorithm - Tag20Algorithm - list of algorithms to be used for interpolation. Defaults to TimeAverage.</li> <li>• Start - Time of first value to be displayed. Can be any valid Excel time format, for example: 8:30:00.</li> <li>• DescriptionAtom - Tag atom of the description, for example: Description</li> <li>• EUAtom - Tag atom of the engineering units, for example: Unit</li> </ul> <p><b>Note:</b> if Start = 23:30:15 and the report is run on 2003/10/22, the values will start at 2003/10/21 23:30:15 and extend to 2003/10/22 00:29:15. For times &lt; 23:00:00 the report retrieves data for the current day.</p>

Table 10. Reports (Continued)

Name	Description	Parameters <sup>(1)</sup>
Monthly Log	31 day log of 31 x 1 day values	<ul style="list-style-type: none"> <li>• Tag01 - Tag20 - List of tag names</li> <li>• Tag01Algorithm - Tag20Algorithm - list of algorithms to be used for interpolation. Defaults to TimeAverage.</li> <li>• DescriptionAtom - Tag atom of the description, for example: Description</li> <li>• EUAtom - Tag atom of the engineering units, for example: Unit</li> </ul> <p><b>Note:</b> if the report is run on 2003/10/22, the values will start at 2003/09/01 00:00:00 and extend to 2003/10/01 00:00:00. The report always starts on the first day of the month before the current day.</p>
Trip Log	31 values, 20 before the trip time, 10 after the trip time and 1 at the trip time.	<ul style="list-style-type: none"> <li>• Tag01 - Tag20 - List of tag names</li> <li>• Tag01Algorithm - Tag20Algorithm - list of algorithms to be used for interpolation. Defaults to TimeAverage.</li> <li>• TripTime - Trip time. Can be any valid Excel time format. e.g. 8:30:00.</li> <li>• DescriptionAtom - Tag atom of the description, for example: Description</li> <li>• EUAtom - Tag atom of the engineering units, for example: Unit</li> </ul>
Snapshot-Historical	Single values for 20 tags at the specified time	<ul style="list-style-type: none"> <li>• Tag01 - Tag20 - List of tag names</li> <li>• ReportTime - Date and time of values. Can be any valid Excel date/time format. e.g. 10/28/2003 12:00:00 PM.</li> <li>• DescriptionAtom - Tag atom of the description, for example: Description</li> <li>• EUAtom - Tag atom of the engineering units, for example: Unit</li> </ul>

Table 10. Reports (Continued)

Name	Description	Parameters <sup>(1)</sup>
Snapshot-Current	Current values for 20 tags	<ul style="list-style-type: none"> <li>• Tag01 - Tag20 - List of tag names</li> <li>• DescriptionAtom - Tag atom of the description, for example: Description</li> <li>• EUAtom - Tag atom of the engineering units, for example: Unit</li> <li>• ValueAtom - Tag atom of value</li> <li>• AlarmAtom - Tag atom of alarm state</li> <li>• QualityAtom - Tag atom of quality state</li> </ul>
Alarm and Event	List of alarms and events between two times for a particular alarm and event object	<ul style="list-style-type: none"> <li>• AreaObject – Alarm and/or Event object</li> <li>• End Time - Report end date and time, defaults to current time.</li> <li>• Start Time - Report start date and time, defaults to 1 day prior to the end time.</li> </ul>

(1) All parameters are optional



# View an Existing Report

Use the appropriate navigation tool to view the report. See [Figure 133](#).

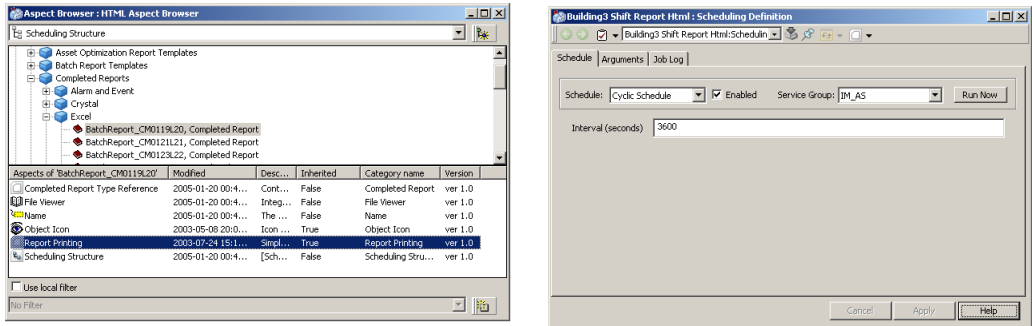


Figure 133. View the Report

An overview of all reports run at different point in time are available via the toggle browser. Select the completed report from the scheduling structure or run it when needed. See [Figure 134](#).

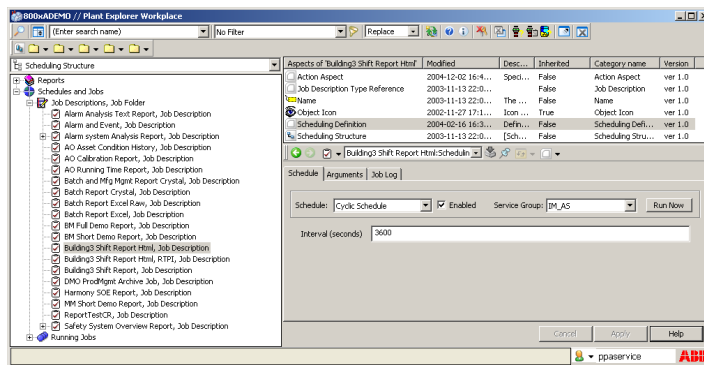


Figure 134. Scheduler

## How to Print a Report

Access the appropriate navigation tool for printing a report, select the report to print out and then Print File. See [Figure 135](#).

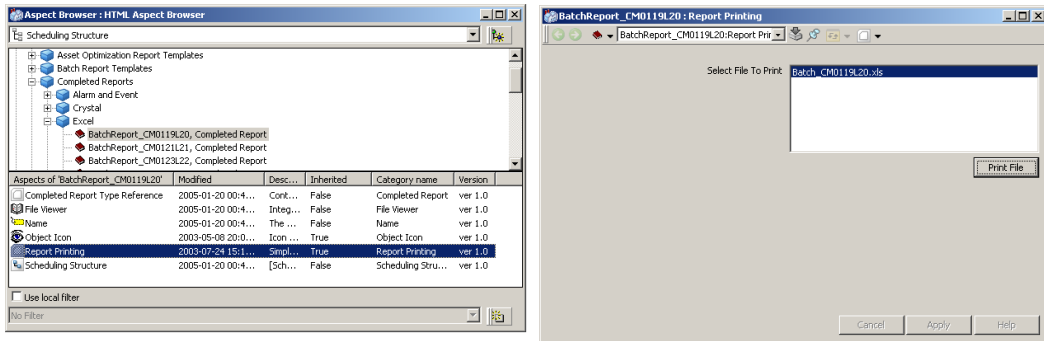


Figure 135. Report Printer Aspect



A printer needs to be setup on the computer that the Excel based reports are run. This is due to the report being set and Excel needs to have a default printer setup to do this, whether or not the report is being printed.

---

## Section 9 SFC Viewer

### Overview

The Sequential Function Chart (SFC) Viewer is a tool in the 800xA System that allows the Operator to display SFC structures with live data for active steps and transitions on Operator workplaces without additional installation of a controller configuration tool.

### Structure Diagram

The structure diagram in the 800xA System is used for visual tracking of sequential control processes and to display details of steps, actions, and transitions. The general display of the sequence control is based on the IEC 1131-3 standards. The default colors for the SFC Viewer animation can be changed workplace-specific for customer needs.

The structure diagram is called up using the SFC viewer aspect:

- Network structure of the sequence is displayed with default view.
- Zoom levels allow to zoom in or out inside the network structure.
- Calling up detailed displays for transitions and actions.

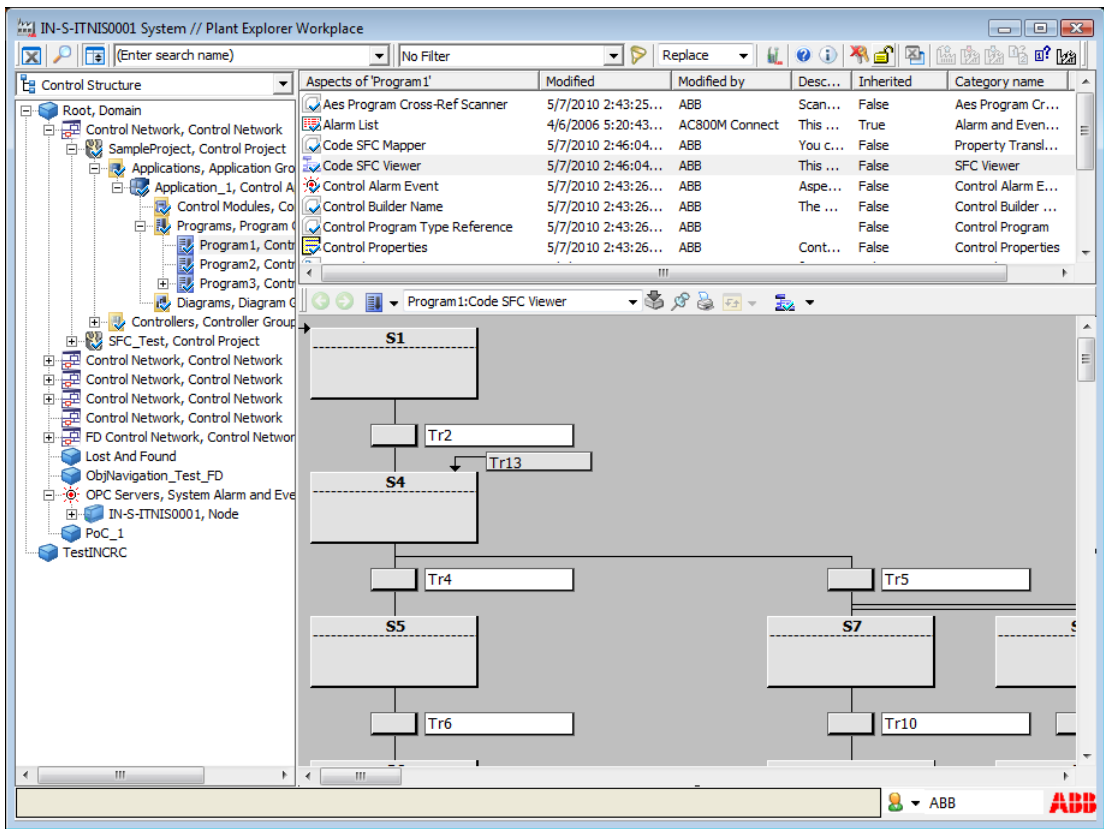


Figure 136. SFC Viewer Aspect to open Structure Diagram in Default Zoom Level

## Structure Display

When the structure diagram is opened, the network structure of the chain is set up. The active step or steps in process are shown in green.

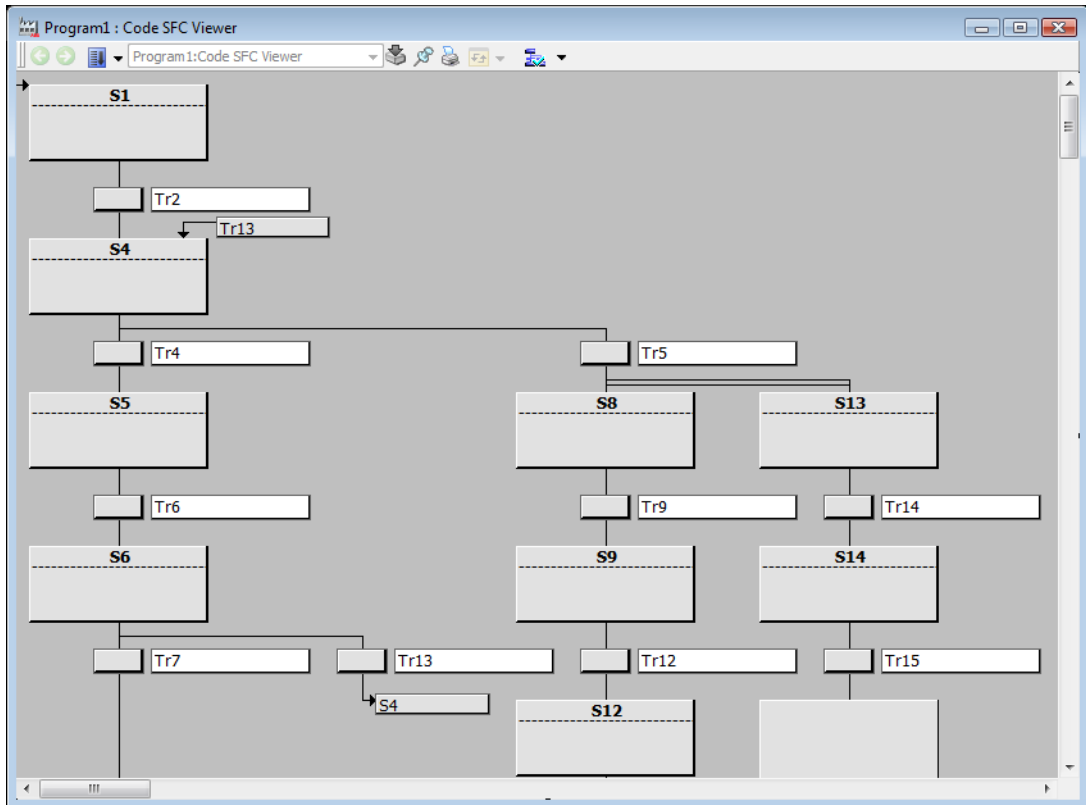


Figure 137. Structure Diagram, Default Zoom Level

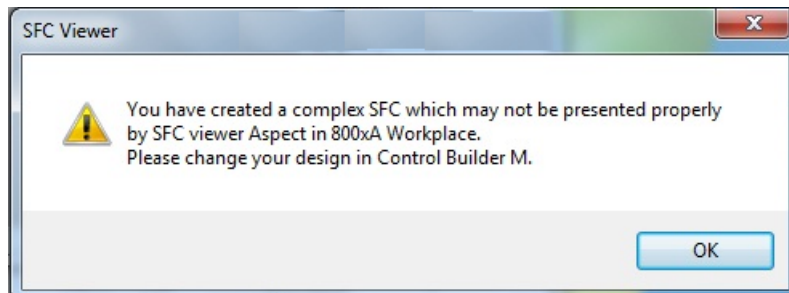
Using the horizontal and vertical scrollbars, the display area can be moved over the entire structure like a magnifying glass. The complete identifiers for transitions and steps are shown in the detailed display. Within a step symbol, the step name and, if configured appropriately, two lines of step text are given.

The detailed display in the 800xA System is updated automatically as the sequence continues to be processed. The currently active step always remains in the display.

The transitions and steps are sensitive push buttons, which allow further detailed displays to be opened. Clicking on the push button opens a further display window containing the associated detailed information (transition and action display).



If a subsequence used in SFC is part of simultaneous sequence, SFC Viewer displays the following warning message:



## Zooming

To open the context menu right-click in the window.

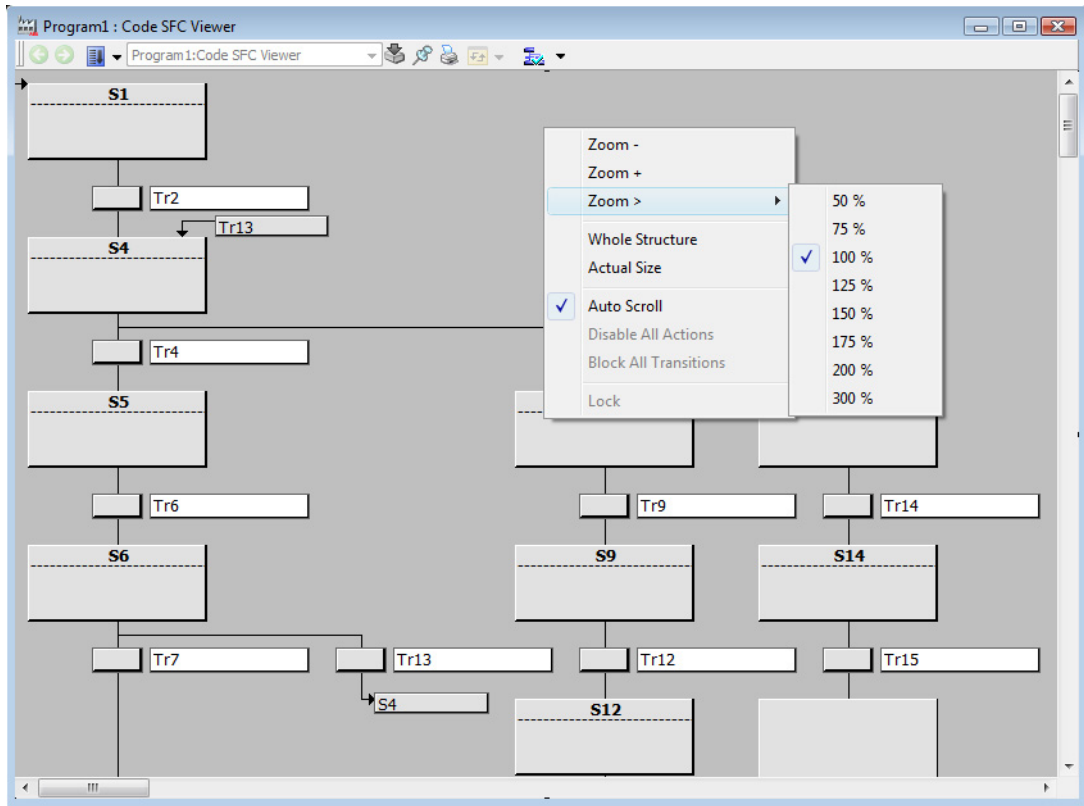


Figure 138. Structure Diagram, Context Menu

The context menu allows the following selection:

*Table 11. Context Menu Functions*

Function	Description
Zoom -	Selection of zoom - allows to make the elements smaller
Zoom +	Selection of zoom + allows to make the elements bigger
Zoom >	The opened submenu allows to select a specific zoom level
Whole Structure	Display the whole network structure
Default Size	Display the elements with default size inside the structure window
Auto Scroll	The display is updated automatically as the sequence continues to be processed. Deselection allows to move manually over the network structure

### Configuration Settings for Displaying the Whole Structure for Transition

#### Feature Pack Functionality

The **WholeStructure** property of the **SFCViewerSettings** aspect is used to set the default view of SFC diagram:

1. Open **Object Type Structure > SFC Viewer Setting > SFC Viewer Setting > SFCViewerSettings** aspect. See [Figure 150](#).
2. Set the Value of **WholeStructure** property:
  - **True** – to display the SFC overview diagram
  - **False** – to display the SFC diagram in default size



The default value of the **WholeStructure** property is false.





Due to access security, only System Engineer with administrator rights or Application Engineer with administrator rights are allowed to change the value of the properties in the **SFCViewerSettings** aspect.

Following image shows the structure diagram if whole structure is selected:

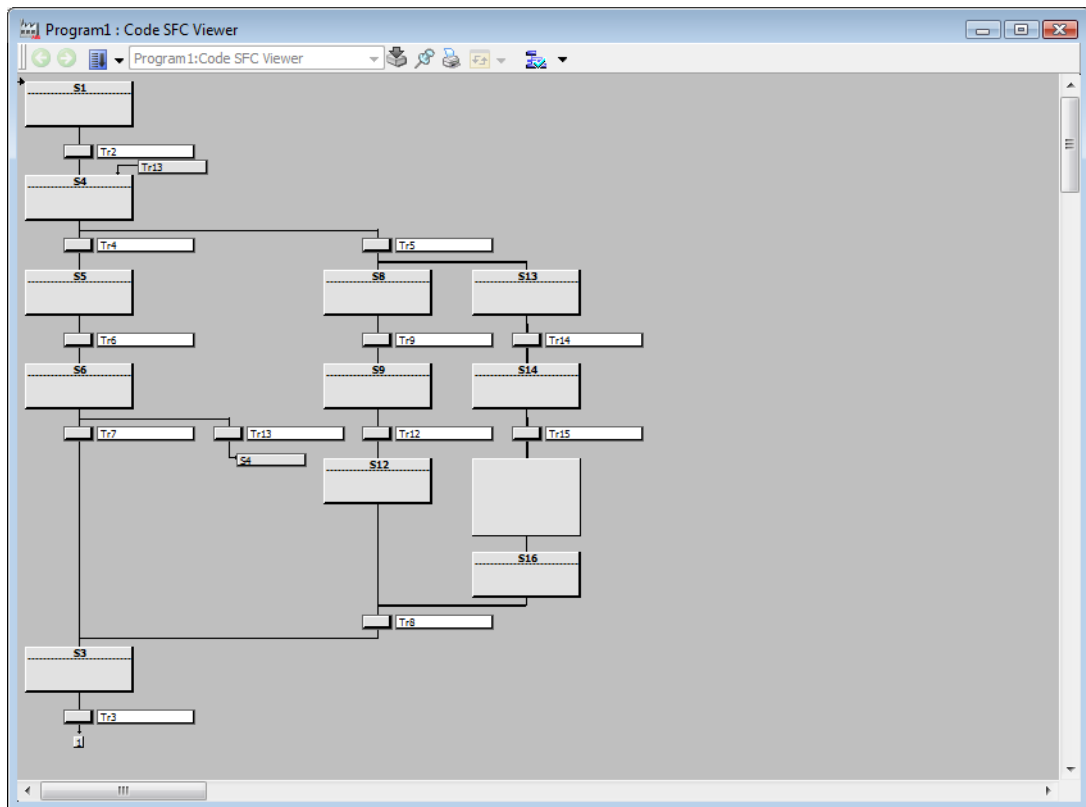


Figure 139. Structure Diagram, Whole Structure Selected

### Configuration Settings to enable/disable the Auto Scroll of SFC Structure

The **AutoScroll** property of the **SFCViewerSettings** aspect is used to set the Auto Scroll function:

1. Open **Object Type Structure > SFC Viewer Setting > SFC Viewer Setting > SFCViewerSettings** aspect. See [Figure 150](#).
2. Set the Value of **AutoScroll** property:
  - **True** – to enable the Auto Scroll by default
  - **False** – to disable the Auto Scroll



The default value of the AutoScroll property is true.

---

## Jump Labels

Jump labels are used wherever logical and graphical improvements to the clarity of a chain structure are required. The jump labels are set by the user in the SFC editor. The text identifier at the branching label identifies the step that follows this logic connection (in this example step 51).

The arrow pointing to the step represents the entry into the step (in the figure below, step S4).

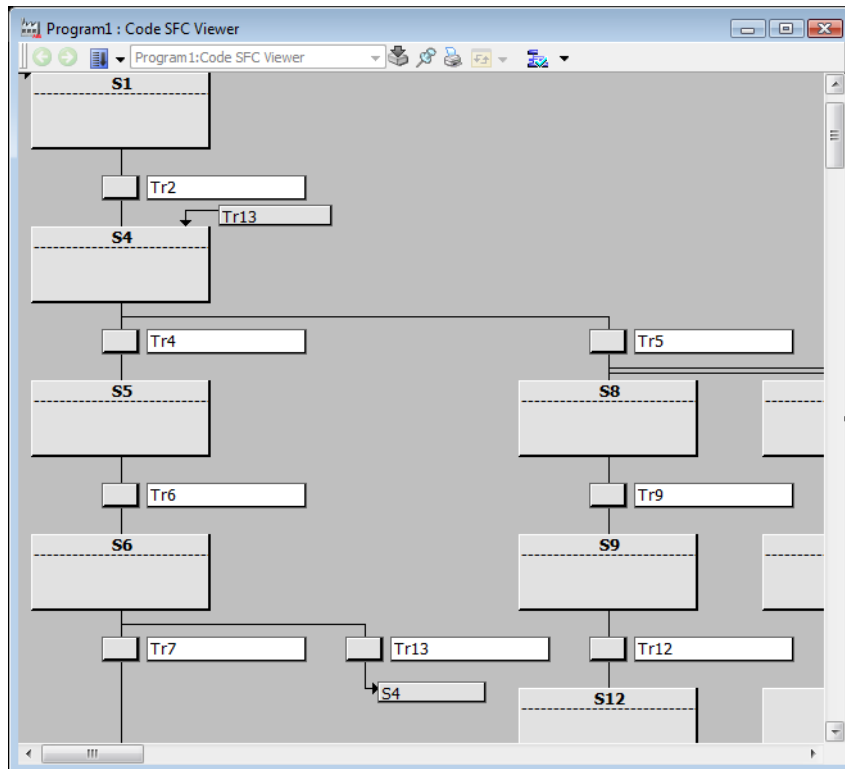


Figure 140. Structure Diagram with Jump Labels

## Subsequence

Subsequence is displayed as a Structure window element in the SFC Viewer. When the user clicks on a particular Subsequence, all the steps and transitions corresponding to that subsequence will be displayed in a separate window. If there are other subsequences that is, nested subsequences in the subsequence window, when the user clicks on the nested subsequence, the same window is updated displaying the subsequence elements (steps and transition). If the initial subsequence is nested, a double-click on any of the subsequence will display the previous subsequence window structure. If the initial subsequence is not nested, a double-click on the subsequence will display the main workplace.

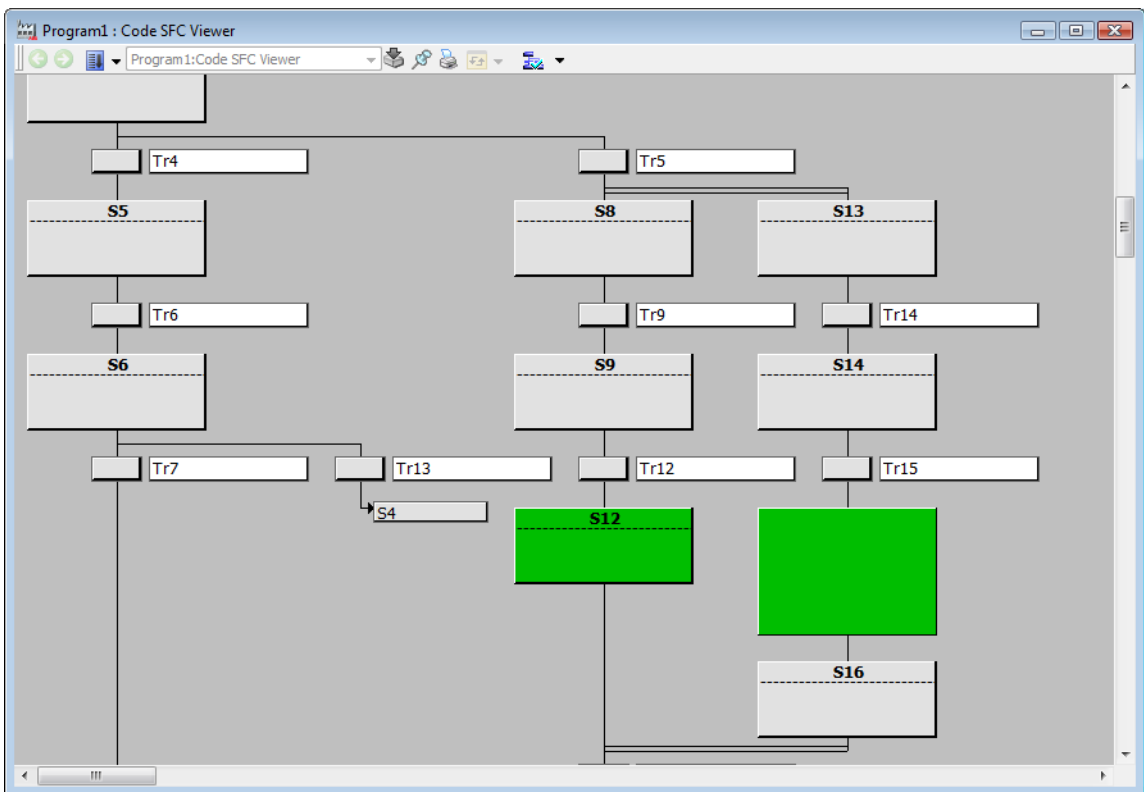


Figure 141. Subsequence Diagram, Default Structure Window

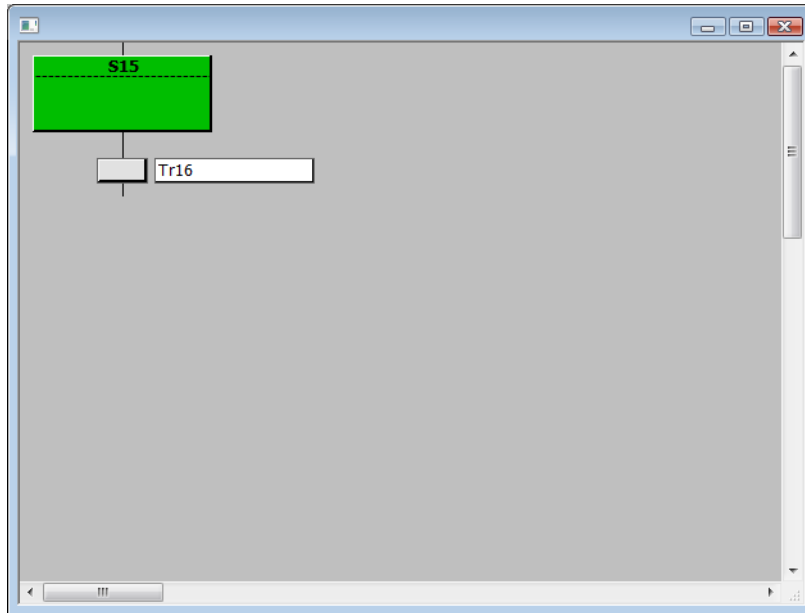


Figure 142. Detail of Subsequence

## Force Block Transition

### Block Transition

When you right-click on a particular transition and if that transition is already blocked, the **Block** option in the context menu will be checked. If the **Block** option is unchecked, you can select it from the context menu. The transition button is blocked and displayed with the Logical Yellow color as background and marked with an **X**. (If the Transition already was blocked, it will be unlocked after clicking on the **Block** option).

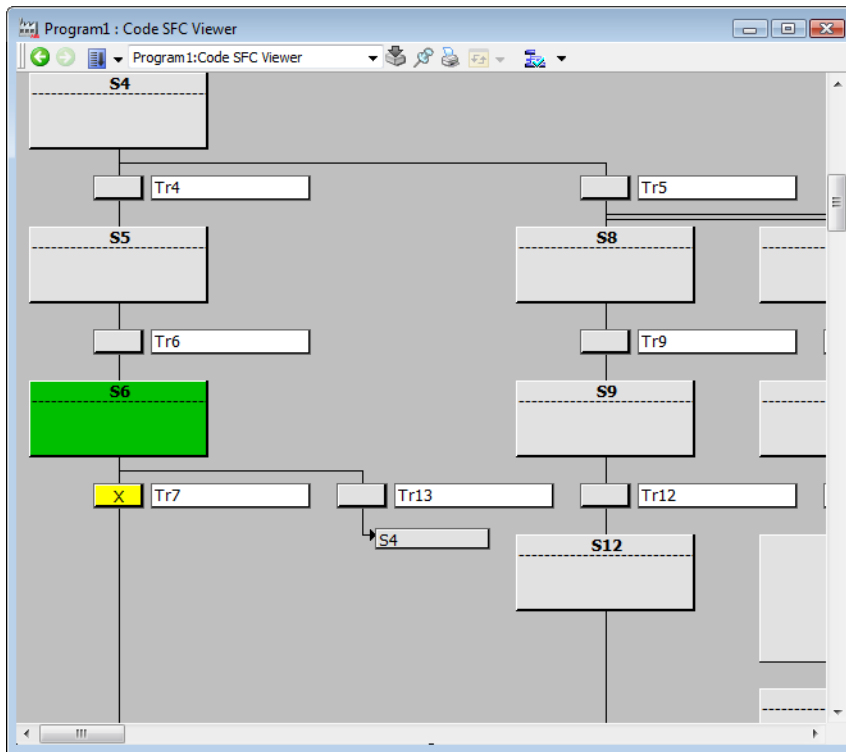


Figure 143. Block Transition, Structure Window

### ForceForward

When you right-click on a particular transition, a context menu appears with **Force Forward** as an option. When the **Force Forward** option is selected, the Active Step will move to Next Step and execute further. (This is executed once and will not automatically force forward during next cycle of sequence execution.)

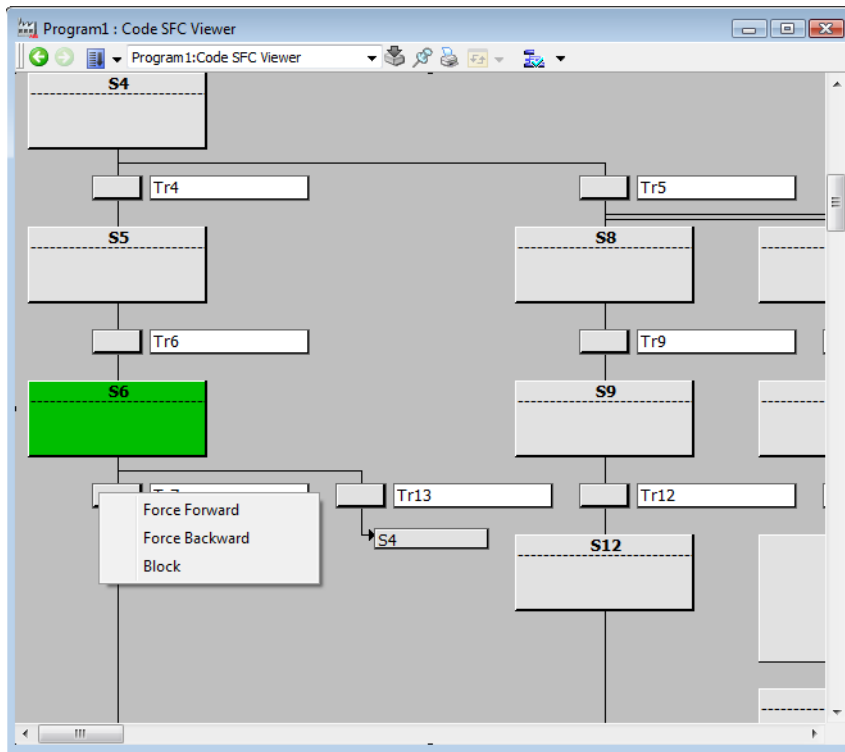


Figure 144. Force Forward, Force Backward and Block Transition

### ForceBackward

When you right-click on a particular transition, a context menu appears with **Force Backward** as an option. Select the **Force Backward** option from the context menu, the Active Step will move to the Previous Step of the transition on which the **Force Backward** option was selected.

### BlockAllTransitions

When you right-click in the structure window and if all the transitions already are blocked then the **Block All Transitions** option in the context menu will be checked.

If the **Block All Transitions** option is unchecked and you select the **Block All Transitions** option from the context menu, then all the Transitions will be blocked. The transition buttons will be displayed with the Logical Light Yellow color as background color and marked with an **X**.

(If all the transitions already were blocked, they will be unblocked after clicking on the **Block All Transitions** option).

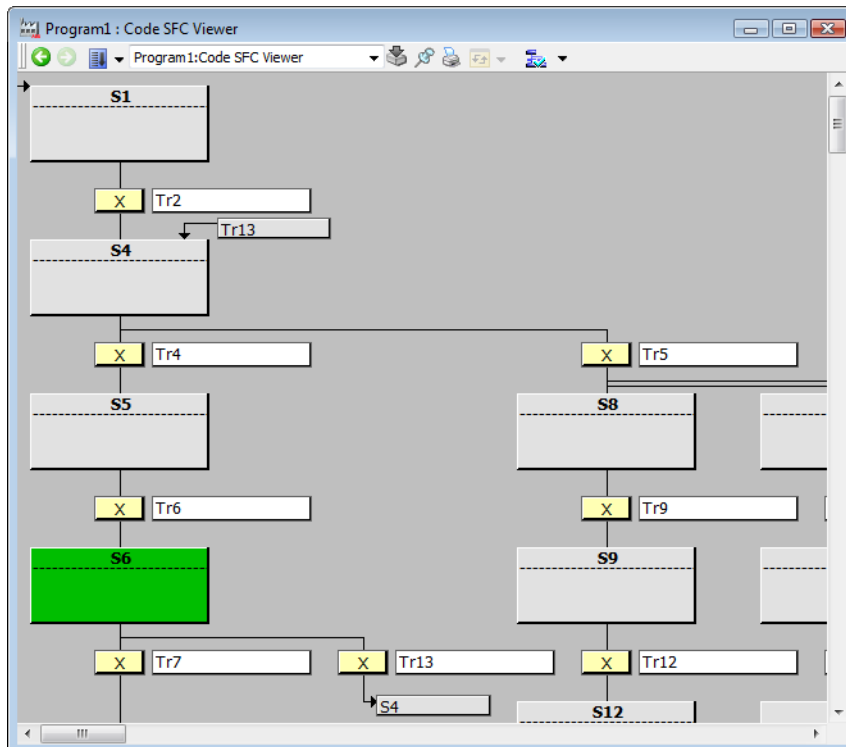


Figure 145. Block All Transition Diagram

### DisableActionForSteps

When you right-click on a particular Step (if the step is already disabled then the context menu option **Disable Action** will be in the checked state) and select **Disable Action** option from the context menu, the Step will be disabled and the step



button will be displayed marked with an **X**. If the step already was disabled, the actions of step will be enabled after clicking the **Disable Action** option again. The background color of the active step will be Green even if the step is disabled. The background color of a passive step will change to Yellow if the step is disabled.

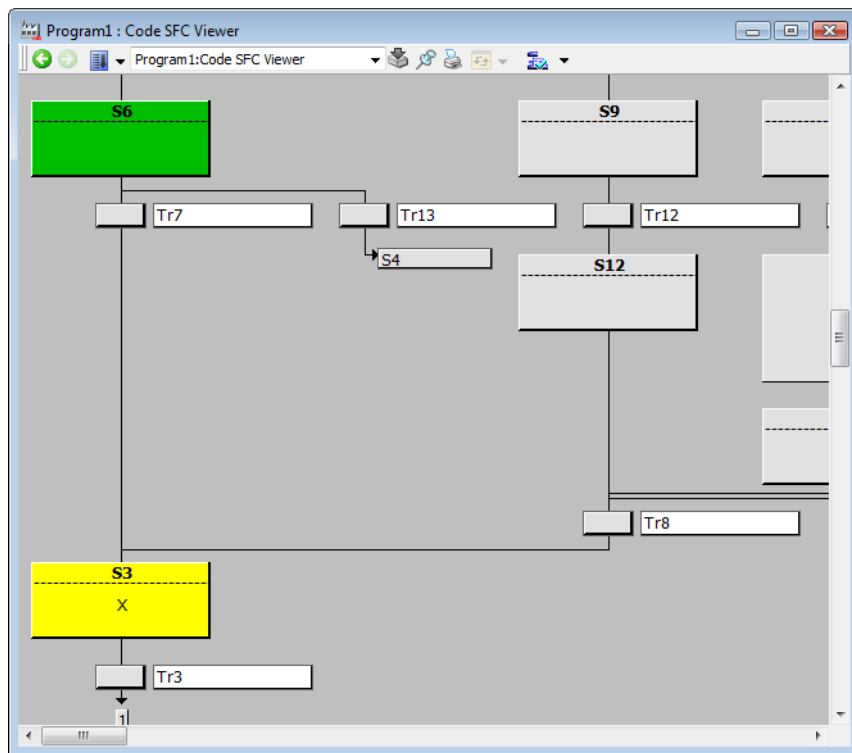


Figure 146. Disable Action for Steps Diagram

### Disable All Actions for All STEPS

When you right-click in the structure window and select the **Disable All Actions** option from the context menu, (if all the steps were already disabled then the menu option **Disable All Actions** will be checked), then all the steps will be disabled. The background color of all the step buttons except the active step will be displayed as a Logical Light Yellow color. All the step buttons will be marked with an **X**. (If all

steps already were disabled then after clicking on the **Disable All Actions** option, all the steps will be enabled).

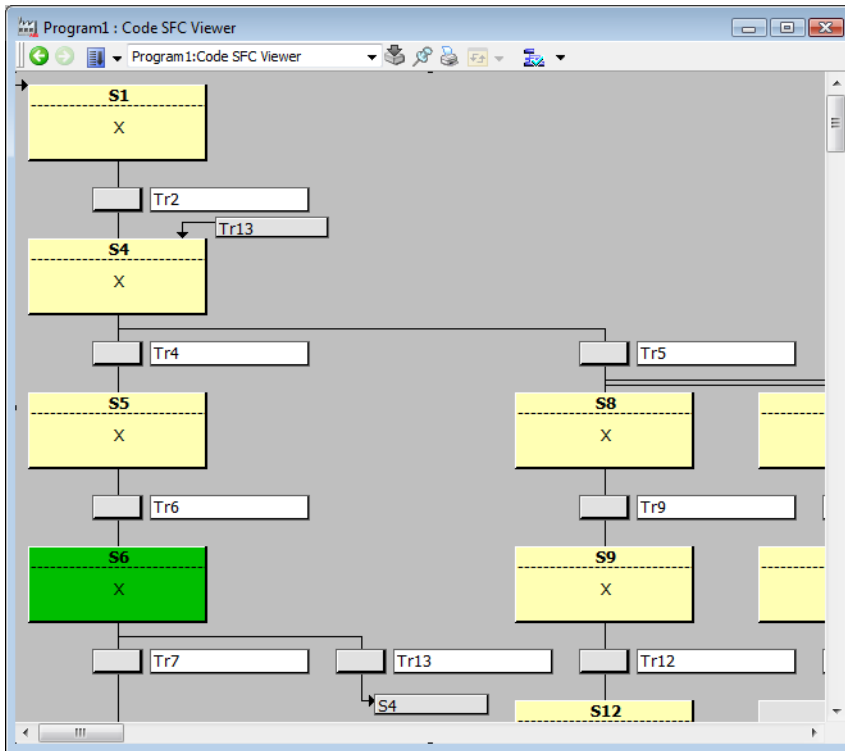


Figure 147. Disable All Actions for All Steps

## SFC Debug Mode

Debug mode is used to block or unblock all the transitions in SFC Viewer. The user has an option for force forward or backward.

Debug Mode is enabled or disabled through SFC Debug Mode option in context menu.

### SFC Debug Mode On

Selecting **SFC Debug Mode On** blocks all transitions in SFC window. All the transitions are displayed with X mark and default yellow color background.

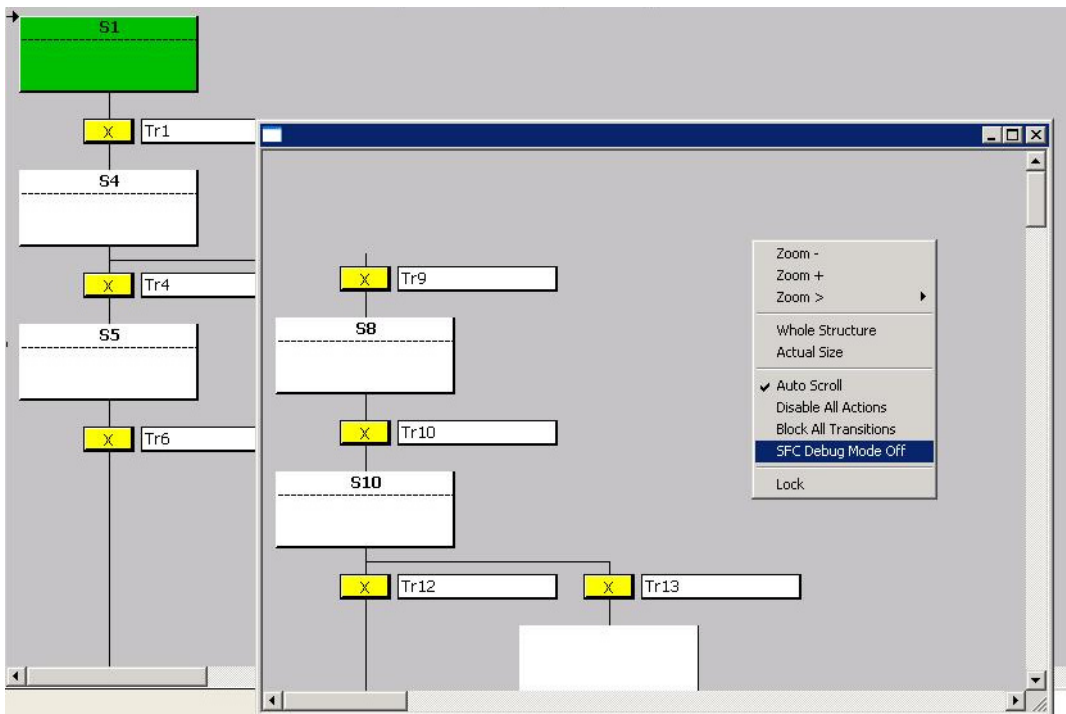


Figure 148. SFC Debug Mode On

Selecting this changes the context menu option to **SFC Debug Mode Off**.

### SFC Debug Mode Off

Selecting **SFC Debug Mode Off** unblocks all the transition blocked earlier and the menu option is changed to **SFC Debug Mode On**.

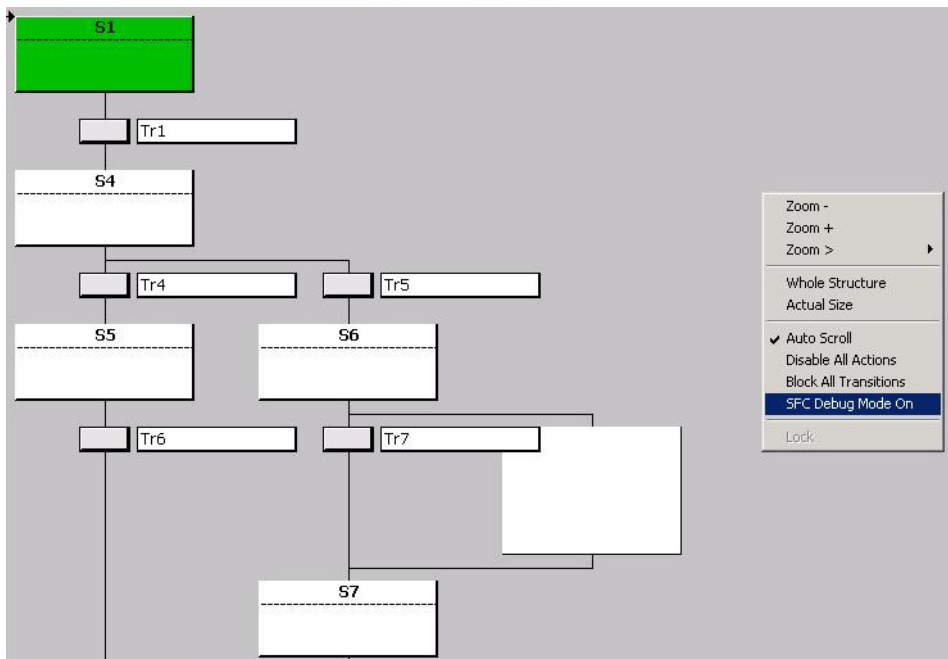


Figure 149. SFC Debug Mode Off

Selecting **SFC Debug Mode Off** option displays the transitions with default background color.



The state of SFC Debug Mode (On/Off) is independent of changes made through CBM or Function Designer.

## SFC Viewer Security

When the user right-clicks a particular transition or a step in the structure window, the options to block or force a transition or disable a step will be enabled in the context menu only if the user has the **ForceSFC** permission configured. For more information about the security permissions, refer to *System 800xA Administration and Security (3BSE037410\*)*.

Additionally, the blocking, forcing of a transition, disabling of a step features will be enabled only when the SFCViewer aspect is locked by the current user. To lock the SFCViewer aspect, right-click the structure window and select **Lock** from the context menu. For more information about object locking, refer to [Object Lock](#) on page 75.



After removing the lock from an SFC Viewer aspect, always close and open the SFC Viewer aspect so that other users can lock it and perform other operations.

## SFC Viewer NLS

When local settings is set to either English /German /Swedish /Chinese /Spanish /Russian /French, then user will view all the tooltip and context menu of SFC Viewer in that corresponding language. If local settings is set apart from above mentioned list, then user will view all the tooltip and context menu of SFC Viewer in English.

## Transitions/Actions

### Transition Display

The transition display can be opened by clicking the transition button in the Structure Display. The transition display shows the stepping criteria for the selected transition in a Function Plan view perspective or a List view perspective.

## Configuration Settings for Displaying the Default View for Transition

### Feature Pack Functionality

The **TransitionDefView** property of the **SFCViewerSettings** aspect is used to set the default view of the transition window:

1. Open **Object Type Structure > SFC Viewer Setting> SFC Viewer Setting > SFCViewerSettings** aspect. See [Figure 150](#).
2. Set the Value of **TransitionDefView** property:
  - **True** – to display the List View as the default view
  - **False** – to display the Function Plan View as the default view



**FontSize** property of **SFCViewerSettings** aspect can be used to change the font size for the transition window and list view in the action window. Default value of this property is 10. For proper view, it is advised to set the font size in the range of 5 to 15.

Name	Value	Type	Description	Readable?	R/Per
TransitionDefView	False	Boolean	Default view in Tra	Yes	
ActionDefView	True	Boolean	Default view in Acti	Yes	
WholeStructure	True	Boolean	True for dsplaying	Yes	
AutoScroll	False	Boolean	True to enable auto	Yes	
FontSize	8	Integer	Font size for Transi	Yes	

Figure 150. SFCViewerSettings aspect with TransitionDefView property

The Function Plan view displays the intermediate and final logic of the transition, providing a high level of supervision and control of the Plant.

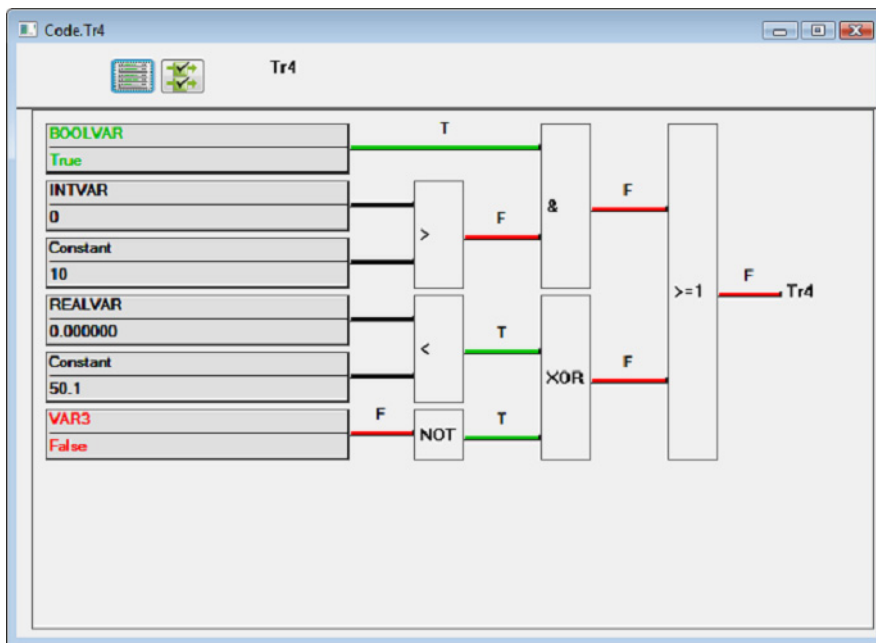
The color of the transition follows the standard color coding approach, wherein the Function Plan view displays the status of the output as True (green color) or False (red color), refer to [Figure 151](#) for more information.



The default colors for the Function Plan view animation can be changed workplace specific for customer requirements.



For more information about the Displaying default view, refer to [Configuration Settings for Displaying the Default View for Transition](#) on page 202.

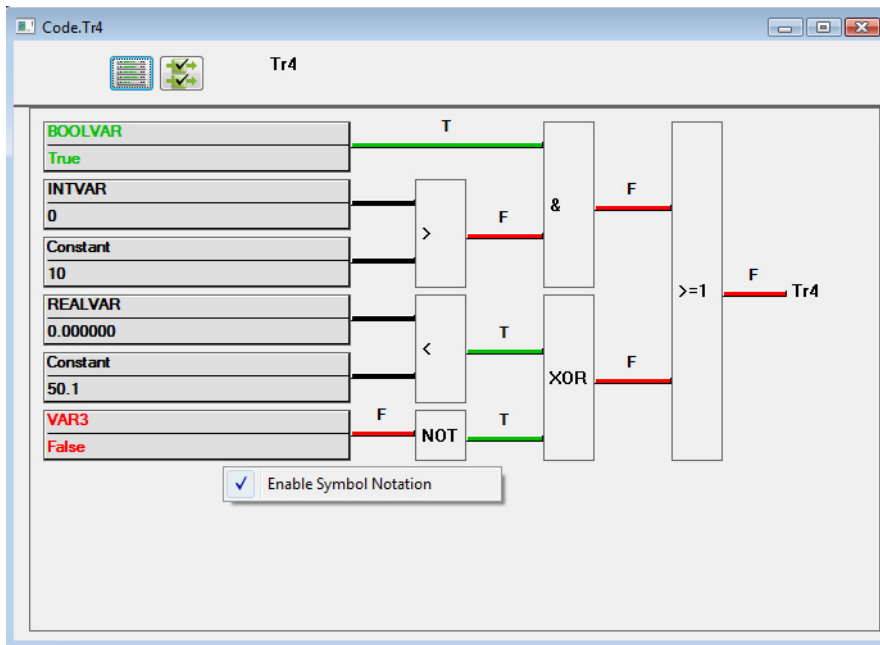


*Figure 151. Display from Function Plan Perspective*

The Function Plan view, by default, labels the status of the intermediate and final logic as:

- **T** - for satisfied criteria.
- **F** - for unsatisfied criteria.

To disable this feature, right-click the Function Plan view display and deselect **Enable Symbol Notation**. Refer to [Figure 152](#) for more information.



*Figure 152. Function Plan View with Symbol Notations*

The List view displays the live values of the selected transition in a tabular format. The supported data types for live values include Integer, Boolean, Float, Char, Time, and Date\_and\_Time, refer to [Figure 154](#) for more information. For analog input criteria, the controller dynamically updates online values of the operands in both the Function Plan view and the List view. The Value column in the List view displays the live analog values. In the Function Plan view, the value is displayed below the variable name.

For expressions containing Boolean and analog values, the Function Plan view displays the animation only for the Boolean output because, the color codes are set



depending on the output status (True or False) of the variables and not for analog output.

Feature Pack Functionality

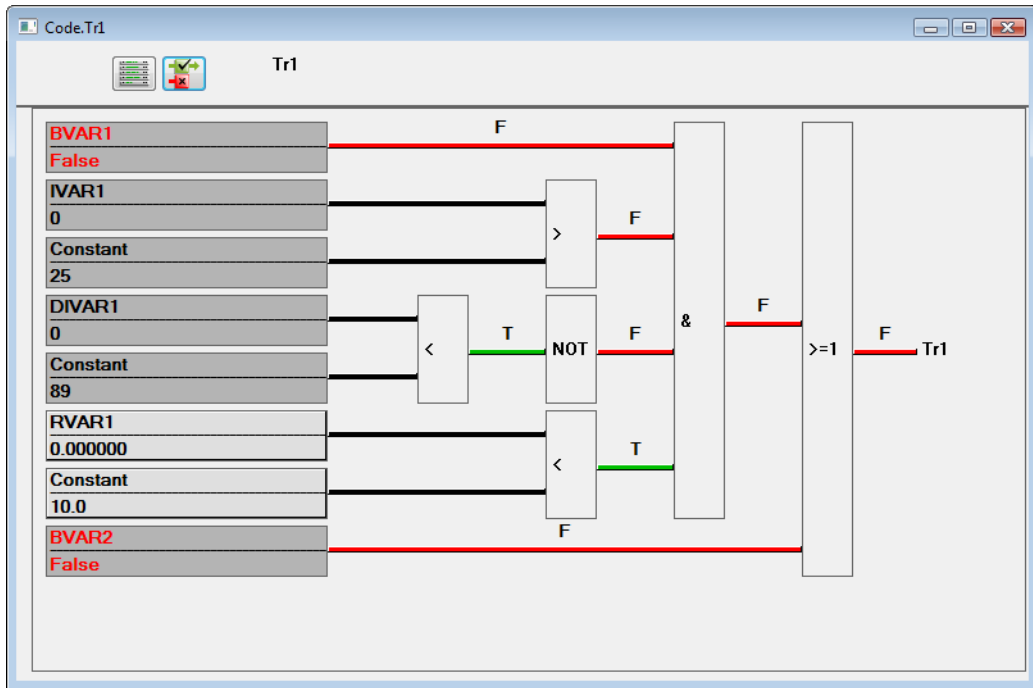


Figure 153. Graphic View (Unfulfilled)

In the functional plan view, selecting the unfulfilled criteria, displays the input operands which causes the expression to fail in the dark gray background in online mode.

## Feature Pack Functionality



If a variable is configured with hidden attribute, when used in Transition Criteria, the corresponding transition window will not be animated in online mode.



If an expression contains Boolean and analog values, the resultant output of the expression, if Boolean, is animated. Boolean expression logic includes AND, OR, Exclusive OR, and NOT gates.

The output of a relational expression logic is also animated. Relational expression logic includes Equal To, Greater than or Equal To, Greater Than, Less Than or Equal To, Less Than, Not Equal To.

The screenshot shows a window titled 'AS1000\_STA.Test\_Auto' with a sub-window 'Test\_Auto'. It displays a table of transition criteria in list view. The table has four columns: Logic, Type, Signal, and Value. The 'Signal' column contains several entries, some of which are highlighted in red, indicating they are unfulfilled criteria. A small tooltip is visible over the 'FIC1005\_AUTOSTAT' signal.

Logic	Type	Signal	Value
and	T	AS1000_STA_FROMSFC.STEPIF01.TMINA	False
and	T	NP1000_AUTOMODE Vakuumpumpe Automatik	True
and	T	NP1001_AUTOMODE	False
and	T	FIC1005_AUTOSTAT FIC1005_AUTOSTAT	False
and	T	UV1000_AUTOMODE	False
and	T	UV1001_AUTOMODE	False

Figure 154. Display in List View (Text Display)

In the list view, the unfulfilled criteria display shows the input operands that cause an expression to fail. For AC800M, if the expression consists of an analog values and the final output is False, selecting the unfulfilled criteria will display all the analog values if the connected block is in unfulfilled state. Refer to [Table 12](#), for unfulfilled criteria supported logic.



The description text is displayed in the signal column. See [Figure 154](#).

### Dynamic Colors for Project Constant Used in Transition Criteria

#### Feature Pack Functionality

---

The project constants used in transition criteria are displayed with dynamic colors based on the mode and status:

- In offline mode, transition window displays the project constants in black color.
- In online mode, transition window displays the project constant based on its type:
  - For non-Boolean (analog) type project constant, the displayed color is black
  - For Boolean type project constant, the displayed color is based on the output values – Green (for True) or Red (for False).



If the value of a project constant, already used in SFC, is changed in Control Builder, ensure that the SFC Viewer aspect containing this project constant is also saved again in Control Builder (uncheck and check the *SFC Viewer Aspect* property of the code block). This ensures that the project constant value is updated in SFC Viewer and the correct color is displayed.

For example, CMYCNST is a project constant of boolean data type with value True, which is colored in transition criteria in List View and Function Plan View, see [Figure 155](#) and [Figure 156](#).

Logic	Type	Signal	Value
and	T	CMYCNST	
and	T	B	True

Figure 155. Project Constant with value True in List View

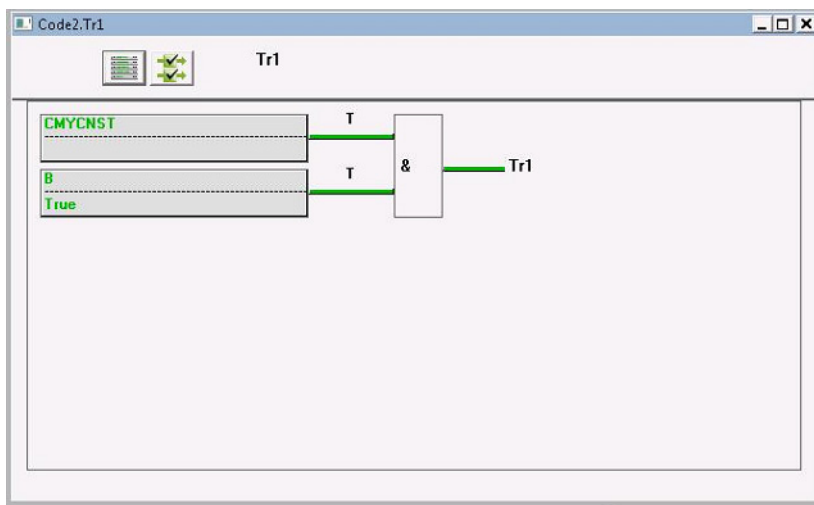


Figure 156. Project Constant with value True in Function Plan View

Table 12. Transition Graphics Elements

Identifier	Description	
Logic	&	AND
	>=1	OR
	>=2	Greater equal 2
	>=n	Greater equal 3
	VAR	Time function
	MOK	Mono stable
	XOR	Ex-Or
	FF	Flip-Flop
	=	Equal
	>	Greater
	>=	Greater or Equal
	<	Less
	<=	Less or equal
	NOT	Not
	Mod	Modulus
Pow	Exponential (that is, raising to the power)	
@name	Function	
Type	Criteria type: - Transition [T] - Release criteria [R0, R1]) - Protection criteria [P0, P1], - End position criteria [E0, E1]	

Table 12. Transition Graphics Elements (Continued)

Identifier	Description
Signal	Name of variable
Value	Status text for the variable Contents depends on the information from the SFC configuration tool: - Name of variable and long text if available - Configured actions
P1 qualifier	This action is computed only for one cycle when the step goes from passive to active
N qualifier	This action is computed when the step is active
P0 qualifier	This action is computed only for one cycle when the step goes from active to passive

## Action Display

The action display can be opened by clicking the step button in the Structure Display.

### Configuration Settings for Displaying the Default View for Action

#### Feature Pack Functionality

The **ActionDefView** property of the **SFC Viewer Settings** aspect is used to set the default view of the action window:

1. Open **Object Type Structure > SFC Viewer Setting > SFC Viewer Settings** aspect. See [Figure 157](#).
2. Set the Value of **ActionDefView** property:
  - **True** – to display the complete configuration in Structured Text format for the qualifiers P1, N, and P0
  - **False** – to display the target diagram reference name and its description in the list (or tabular) format for qualifiers P1, N, P0.

### 3. Click Apply.

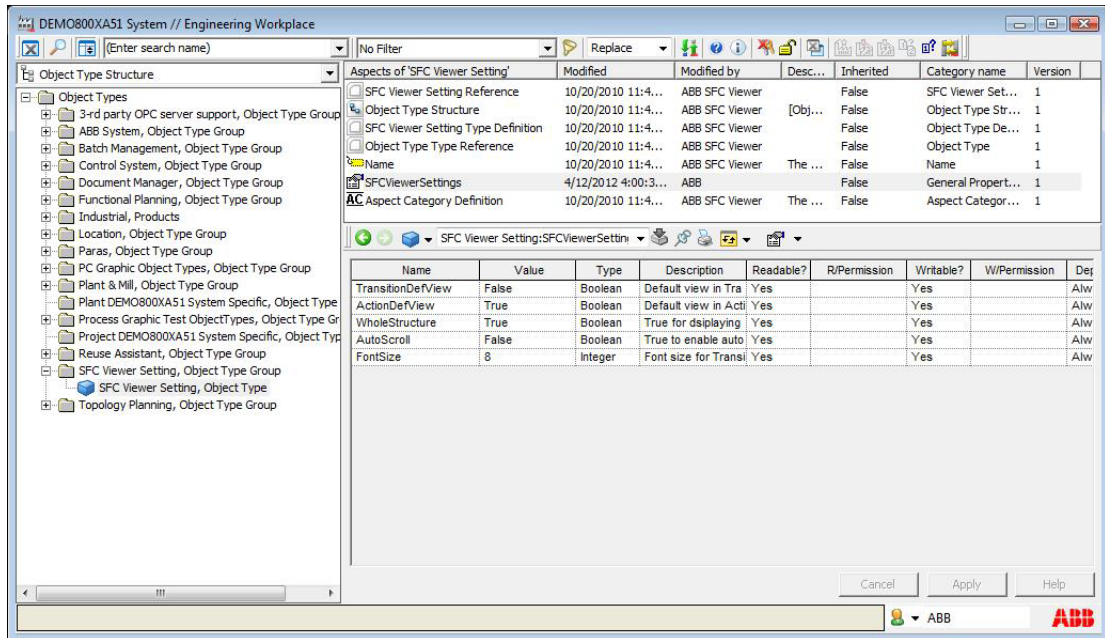


Figure 157. SFCViewerSettings aspect with ActionDefView property

## Action Display for Qualifiers P1, N, and P0

**P1 Qualifier:** This action is computed only for one cycle when the step goes from passive to active.

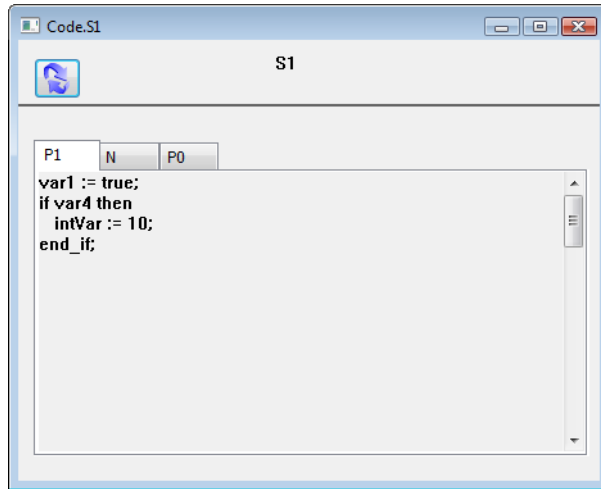


Figure 158. Action Display P1 Qualifier

**N Qualifier:** This action is computed during the step is active.

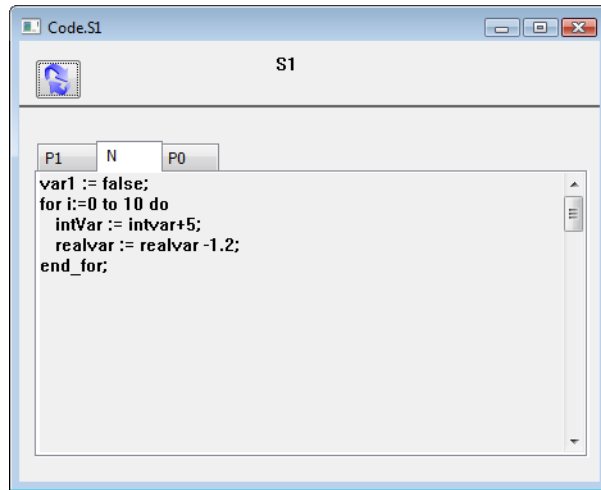


Figure 159. Action Display N Qualifier



**P0 Qualifier:** This action is computed only for one cycle when the step goes from active to passive.

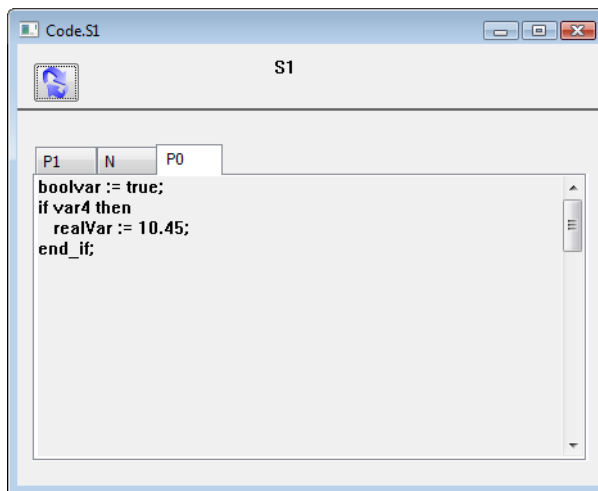


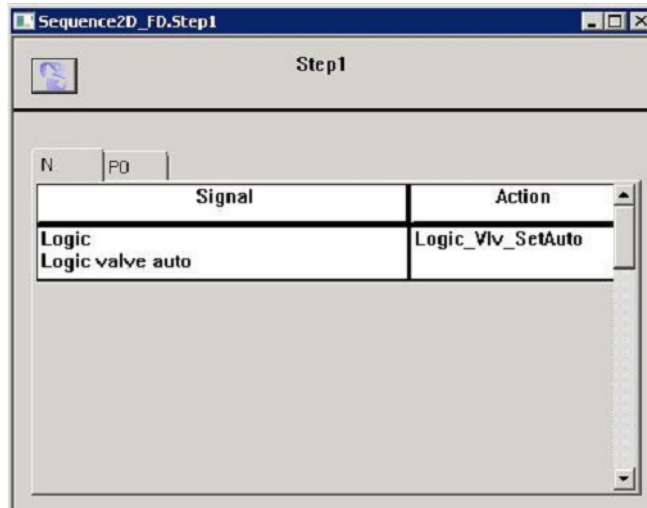
Figure 160. Action Display P0 Qualifier

### Action Display with Target Diagram Reference Name and Description

#### Feature Pack Functionality

For details regarding the configuration setting required for action display with target diagram reference name and description, refer to *System 800xA Configuration (3BDS011222\*)* manual.

In the action display, the diagram reference name and its description is displayed in the **Signal** column and the operation/action is displayed in **Action** column. See [Figure 161](#).



Step1	
Signal	Action
Logic valve auto	Logic_Vlv_SetAuto







Figure 161. Action Display with diagram reference name and its description



If communication variables or global variables used in a step do not have any target reference in the configured sequence, the names of these variables appear in the Signal column, instead of the target diagram reference names. In this case, no data appears in the corresponding Action column.

## Selections

Table 13. Buttons Inside the Transition/Action Displays

Function	Symbol	Description
Operator guide mode/autoscroll		Push button for selecting auto refresh for this window when changing step or transition  The <b>Auto Refresh</b> option is not available for AC 800M objects.
		Push button for “freezing” the data for the selected step or transition (no operator guidance)
Transition view		Push button to change the transition view to Function Plan view (graphical) from List view.
		Push button for selecting transition in list form
Transition filtering		Push button for displaying the open, unfulfilled criteria
		Push button for displaying all criteria for a transition.

## Object Navigation

SFC Viewer supports navigation to the AC 800M controller objects from the transition Function Plan view and the List view. The object navigation feature is enabled for the transition criteria that are linked to specific controller objects. When the user right-clicks a particular transition criterion, a context menu is displayed showing all the aspects of the object, see [Figure 162](#).

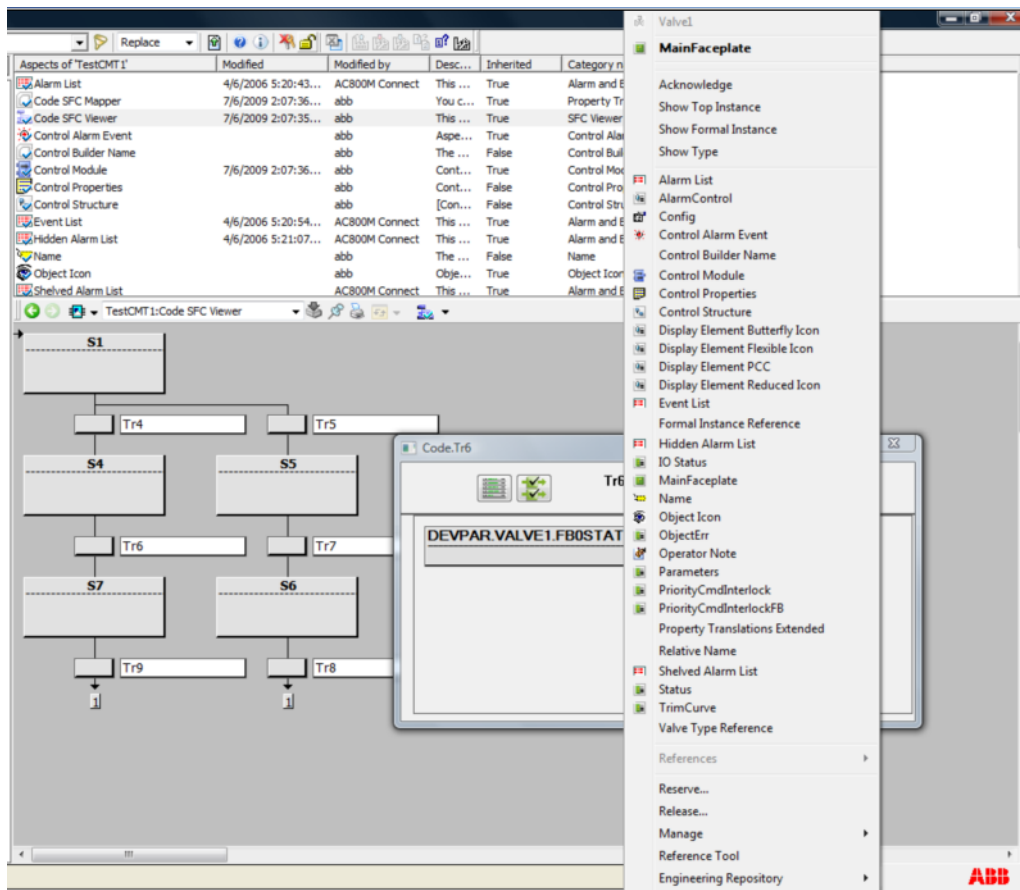


Figure 162. Object Navigation Context Menu

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**Feature Pack Functionality**

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SFC Viewer also supports navigation to the AC 800M controller objects from the action display with diagram reference name. The object navigation feature is enabled for the action that is linked to specific controller objects. When the user right-clicks a particular diagram reference name, a context menu is displayed showing all the aspects of the object.

---

A context menu makes the navigation to different aspects easy and provides the user with relevant information about the object.

In a transition, when a particular condition or interlock is not fulfilled, the user can navigate directly from the SFC Viewer to the object holding the condition and take appropriate corrective actions.

For example, to open the main faceplate of an object that is linked to an unsatisfied condition, right-click the specific transition criterion and select **MainFaceplate** from the context menu.

This feature assists the user to understand the cause of an unsatisfied condition and manipulate the object accordingly.

The user can also double-click a particular criterion to open the default aspect, see [Figure 163](#).



The Object Navigation feature is enabled only for the objects that are included in the Control Structure.

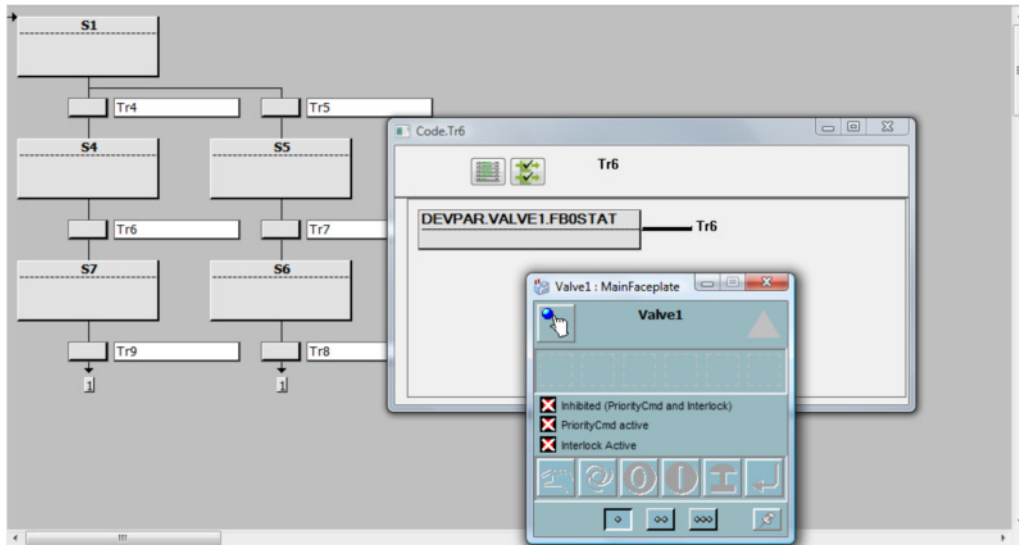


Figure 163. Object Main Faceplate



If user-defined CM/FBs having their own faceplates are used in transition, disable the Aspect Object property of all the standard CM/FBs from which these CM/FBs are created. This ensures that selecting **MainFaceplate** from the context menu in the transition window results in opening of the user-defined faceplate, and not the standard faceplate of the CM/FB.

#### Feature Pack Functionality

In the action display, to open the faceplate, double-click the diagram reference name in the **Signal** column, or open the context menu of the diagram reference name in the **Signal** column and select **MainFaceplate** (see Figure 164).

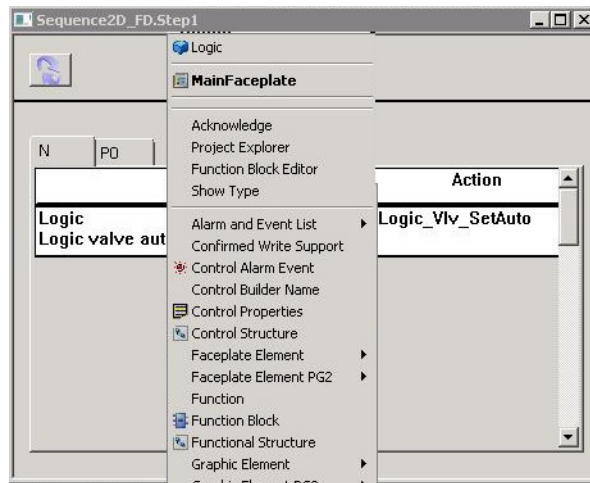


Figure 164. Diagram Reference Name Context Menu

## Object Navigation for Structured Data Type Variables

### Feature Pack Functionality

The Object Navigation feature is also supported for structured data type variables, even when the respective control modules or function blocks are not direct child elements of the object with SFC viewer aspect.

For this, the SFC Uploader aspect is used (see [SFC Uploader Aspect](#) on page 221).

[Figure 165](#) shows the workflow in Control Builder and Engineering Workplace to obtain the Function Plan view or the List view of the transition that is defined using structured data types in control modules.

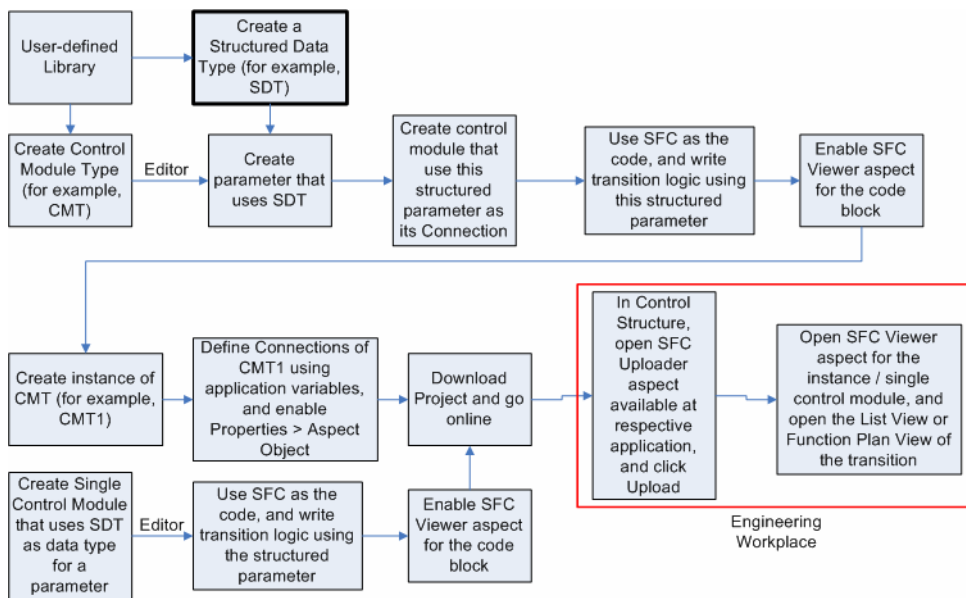


Figure 165. Opening List View or Function Plan View of transition that uses structured variables in control modules



Figure 166 shows the workflow in Control Builder and Engineering Workplace to obtain the Function Plan view or the List view of the transition that is defined using structured data types in function blocks.

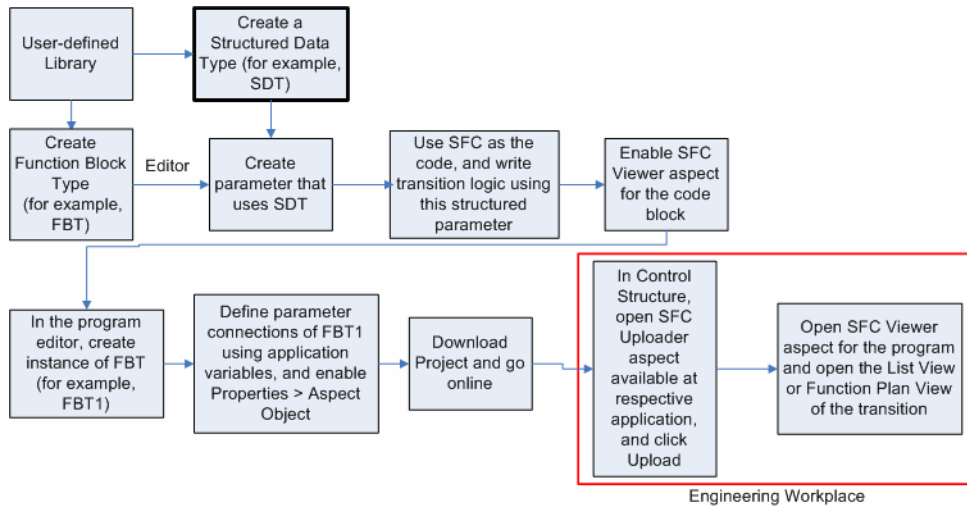


Figure 166. Opening List View or Function Plan View of transition that uses structured variables in function blocks

### SFC Uploader Aspect

The SFC Uploader aspect is used to map the structured data type variables and communication variables to get the driving object path when configured using Control Builder M. After the driving object path is mapped, it is possible to navigate to the AC 800M controller objects from the Function Plan view or the List view of the transition that uses these structured data type variables and communication variables.



The SFC Uploader aspect needs to be manually created at application level on all the new instances as well as on all the instances already configured.

Figure 167 shows the SFC Uploader aspect with the **Upload** button and the **Display Tag Separator** field.

Variable Name	Driving Object Path
SDT.SDT1	Applications.Application_1.SM1.PConstant.4
SDT.SDT4.Value	Applications.Application_1.SM1.Valve_TP.1
PRJ_t.PC2	PRJ_t.PC2.ReadId
SDT.SDT_Vlvpar.ManCmd0	Applications.Application_1.SM1.Valve_TP.1
SDT.SDT8	Applications.Application_1.SM1.AnalogInCC2.4
pr_t.PC3	Applications.Application_1.VLV10_Fd.VL.v10.4

Figure 167. SFC Uploader aspect

Click **Upload** to obtain the driving object path of the variables.



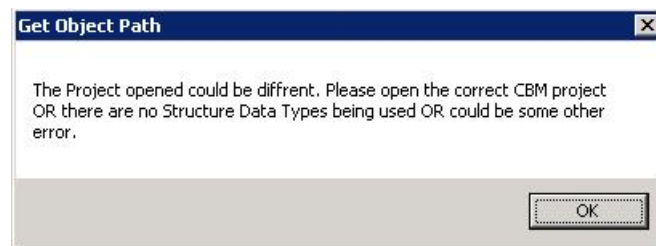
Clicking **Upload** would regenerate the driving path for all the structure data type variables used in that application.

The **Display Tag Separator** field is used to specify how the tag names of structured data type variables are displayed in the transition window, based on the maximum number of dots (path of the sub-components of the variable):

1. Enter an integer value in the range 1 to 6 in the **Display Tag Separator** field.
2. Click **Upload**.

The transition window displays the tag name of the structured data type variables with the sub-components (dot notation) upto the integer value entered. For example, for a Display Tag Separator value **2**, the tag name displayed is *Var1.PidAdv*; and for a value **3**, it is *Var1.PidAdv.StartAT*.

In some cases, after clicking **Upload**, the *Get Object Path* error message is displayed (see [Figure 168](#)).



*Figure 168. Get Object Path error message*

The error message in [Figure 168](#) is displayed if the corresponding Control Builder project is not kept open while clicking **Upload**. In this case, if Control Builder itself is not kept open, Control Builder tends to open, but never opens and a source code error is shown.

To troubleshoot the *Get Object Path* error message, open the correct project in Control Builder, download the project again, and then click **Upload** in the SFC Uploader aspect window.



The name of the structured data type variable is case-sensitive if used inside a transition. Therefore, the Get Object Path error message is displayed if the name of the structured data type variable used in transition does not match the case in the actual name.

To troubleshoot, ensure that the names are of identical case.

In the List View or Function Plan View:

- Right click the structured data type variable to display context menu with respect to the CMs/FBs.
- Double-click the structured data type variable to open the default aspect of CMs/FBs.

### **Object Navigation for Structured Data Types through Communication Variable**

The SFC Viewer supports navigation to the object even when the structured data types in an application are connected through communication variables between applications in a project.

For this, the SFC Uploader aspect is used (see [SFC Uploader Aspect](#) on page 221).

Figure 169 shows the workflow in Control Builder and Engineering Workplace to obtain the Function Plan view or the List view of the transition that is defined using communication variables with structured data types in an application.

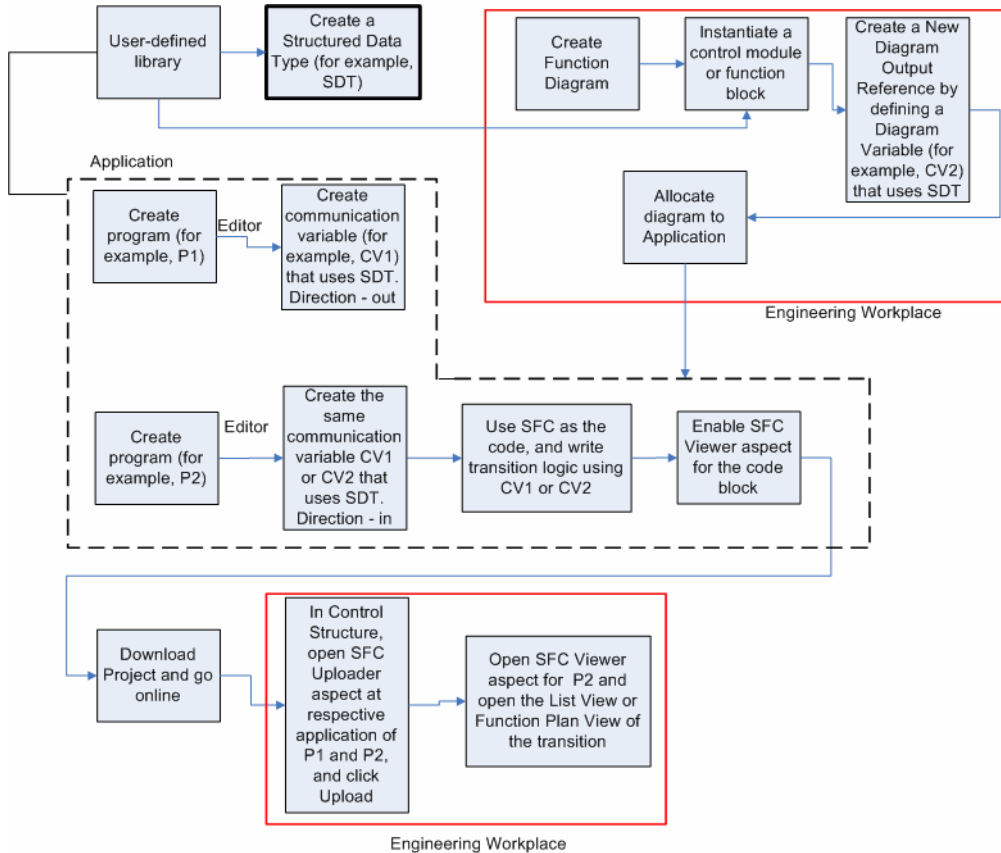


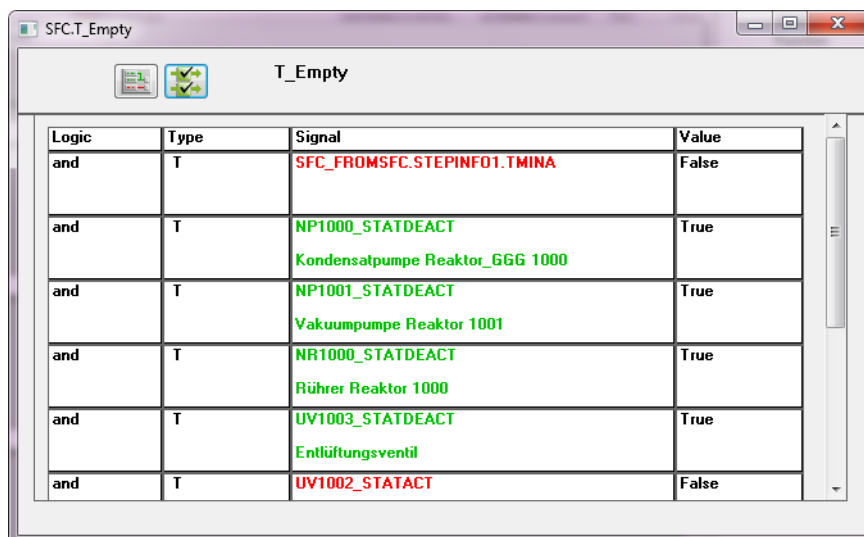
Figure 169. Opening List View or Function Plan View of transition that uses communication variables with structured data type

In the List View or Function Plan View:

- Right click the communication variable to display context menu with respect to the CMs/FBs.
- Double-click the communication variable to open the default aspect of CMs/FBs.

### Display of Actual Tag Name when Using Structured Data Types

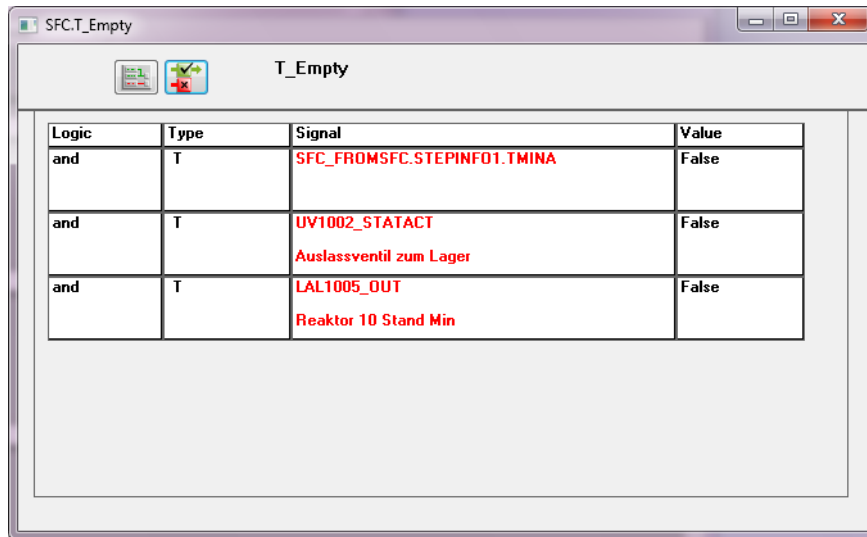
The SFC Viewer transition window displays the actual tag name and its description when used with structured data type, in the List View (see [Figure 170](#)). The actual tag name and its description is also displayed for Unfulfilled Criteria window (see [Figure 171](#)).



The screenshot shows a window titled 'SFC.T\_Empty' with a sub-window 'T\_Empty'. It contains a table with the following data:

Logic	Type	Signal	Value
and	T	SFC_FROMSFC.STEPIF01.TMINA	False
and	T	NP1000_STATDEACT Kondensatpumpe Reaktor_GGG 1000	True
and	T	NP1001_STATDEACT Vakuumpumpe Reaktor 1001	True
and	T	NR1000_STATDEACT Rührer Reaktor 1000	True
and	T	UV1003_STATDEACT Entlüftungsventil	True
and	T	UV1002_STATACT	False

Figure 170. Display of actual tag name and description in the transition window



The screenshot shows a window titled "SFC\_T\_Empty" with a sub-header "T\_Empty". Below the header is a table with four columns: Logic, Type, Signal, and Value. The table contains three rows of data, each representing an unfulfilled criterion. The "Signal" column contains both a tag name and a description in red text.

Logic	Type	Signal	Value
and	T	SFC_FROMSFC.STEPINFO1.TMINA	False
and	T	UV1002_STATACT Auslassventil zum Lager	False
and	T	LAL1005_OUT Reaktor 10 Stand Min	False

Figure 171. Display of actual tag name and description for Unfulfilled Criteria



If the user does not perform upload action, then instead of the tag name and its description, variable name and its description is displayed.



If the user selects the SFC Uploader which was created along with the SFC viewer aspect, Following warning message is displayed:

Please open the SFC Uploader aspect present at application level.

If clicked OK, an empty uploader window is displayed.

**Object Navigation feature is supported based on the usage of SFC Uploader Aspect.****If SFC Uploader Aspect is not used**

- Only for the AC 800M Libraries. It works only for those criteria that are configured in Control Builder and are linked to the objects.
- Only for tags or variables declared in the `<object name>_<xxx>` format and `<xxx>` must not contain an “\_” (underscore) character.
- Only for object with structured data type variables referred in the sequence, only if this object is the child object of a single control module / Diagram / Program, where SFC is configured.
- Even if structured data type variable is connected through communication variable in the same application.

**If SFC Uploader Aspect is used**

- For a structured data type variable, even when the respective control modules or function blocks are not direct child elements of the object with SFC viewer aspect.
  - For a structured data type variable connected through Communication Variable in same or different application within the project.
  - For a variable declared in `<objectname>_<xxx>` format and when that variable does not have corresponding driving object path in SFC Uploader aspect. In this case, the variable description is displayed in the transition window list view.
-



## Limitations

- Limitation on 8 steps and 16 transitions that can work in parallel at the same time.
- No live data for actions are displayed.
- Animation of the logic gates output is enabled for Boolean and relational expression logic only.
- User-defined graphic elements have a slow update time while displaying SFC information.
- More than one step and one transition can be used in a subsequence. Subsequence must not contain more than two levels of sequence selection or simultaneous sequence.
- The Object Navigation feature is not supported:
  - For two or more objects configured with the same name in the Control Structure, irrespective of projects. In this case, an error message (Object name not found) is displayed.
  - For structured data types connected through communication variables created or referenced in different Projects.



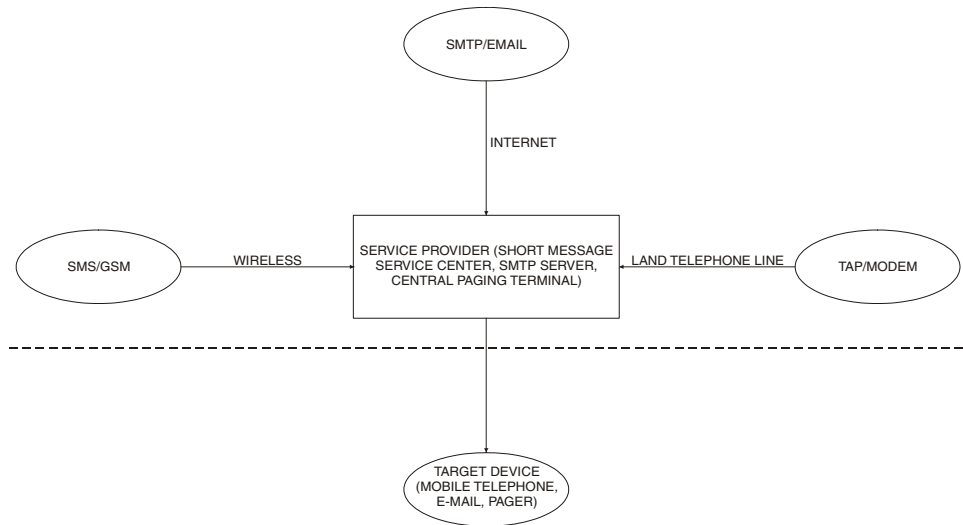
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# Section 10 SMS and E-mail Messaging Operation

## Overview

SMS and e-mail Messaging provides a method for sending messages based on alarm and event information to user devices such as mobile telephones, e-mail accounts, and pagers. It is possible to control sending messages by configuring the Message Schedule for each user. The Message Schedule allows one active paging time interval for each day of the week.

[Figure 172](#) shows and [Table 14](#) lists the three methods SMS and e-mail Messaging employs to notify users of alarm and event information. The table also lists the devices that are compatible with each notification method, and which devices, using the SMS/GSM notification method, allow the user to confirm receipt of the message back to the 800xA System.



T05164A

Figure 172. Notification Methods

Table 14. Notification Methods

Device <sup>1</sup>	Notification Method		
	SMTP/E-mail	TAP/Modem	SMS/GSM
Numeric Pager	—	—	—
Alphanumeric Pager	Notify	Notify	Notify
2-Way Pager - Fixed Reply	Notify	Notify	Notify
2-Way Pager - User Entered Reply	Notify	Notify	Notify/Confirm Receipt
2-Way GSM Pager	Notify	Notify	Notify/Confirm Receipt
Text Messaging Enabled Telephone	Notify	Notify	Notify/Confirm Receipt
Wireless Equipped PDA	Notify	Notify	Notify/Confirm Receipt

Table 14. Notification Methods (Continued)

Device <sup>1</sup>	Notification Method		
	SMTP/E-mail	TAP/Modem	SMS/GSM
E-mail	Notify		Notify/Confirm Receipt

**NOTE:**

1. This table lists the capabilities of SMS and e-mail Messaging. The selected hardware and/or service provider may impose other limiting factors.

The notification methods work as follows:

- **SMS/GSM** - uses Short Message Service (SMS) to send messages based on alarm and event information to the Global System for Mobile Communication (GSM) service provider's Short Messaging Service Center (SMSC) over a wireless network. The SMSC sends the message to compatible devices of users configured to receive them. This method allows users of the compatible devices to confirm receipt of the message.
- **SMTP/E-mail** - uses Simple Mail Transfer Protocol (SMTP) to send messages based on alarm and event information to an SMTP server over the Internet. The SMTP server sends the message to e-mail accounts, or to compatible devices via e-mail accounts, of users configured to receive them.
- **TAP/Modem** - uses Telocator Alphanumeric Protocol (TAP) to send messages based on alarm and event information to the pager service provider's Central Paging Terminal over a land telephone line. The Central Paging Terminal sends the message to compatible devices of users configured to receive them. A block diagram of SMS and e-mail Messaging is shown in [Figure 173](#).

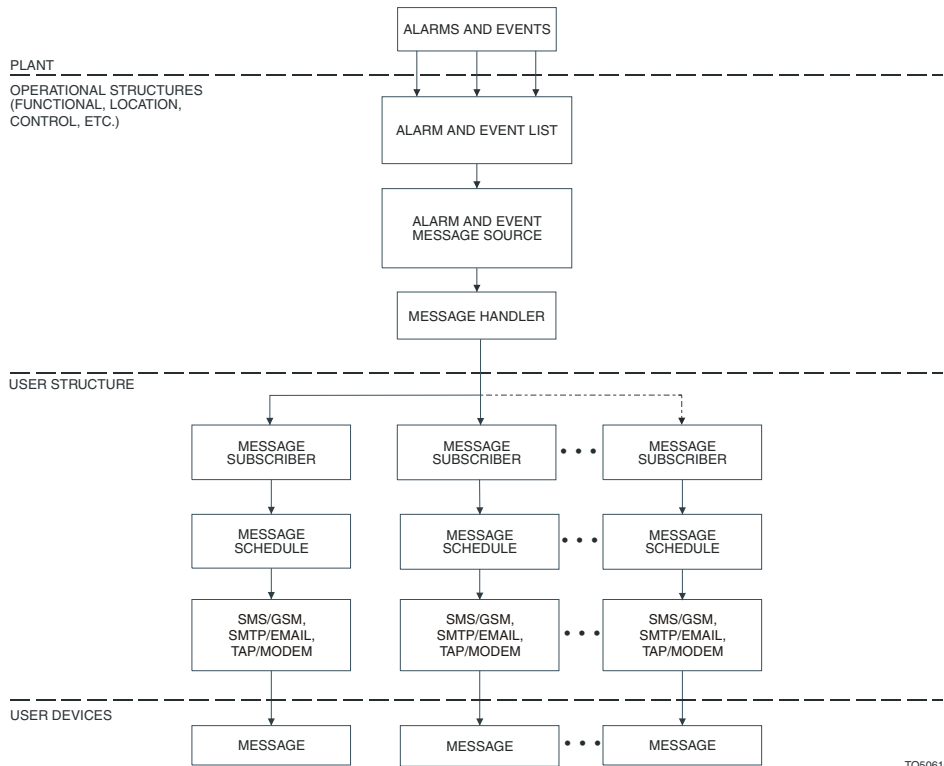


Figure 173. Block Diagram

The figure shows the data flow from the time the Alarm and Event List is notified of an event. SMS and e-mail Messaging consists of several components. When an alarm is generated, it is sent to the Alarm and Event List. An SMS and e-mail Messaging component, the Alarm and Event Message Source, monitors the Alarm and Event List associated with it. When it senses an event it formats a message (based on configured values) and sends the message to the Message Handler. The Message Handler sends the message to destinations (individual users or user groups) subscribed via the Message Subscriber.

The Message Schedule determines which users receive messages based on their schedule. If it determines a user is scheduled to receive a message via SMS/GSM, SMTP/E-mail, or TAP/Modem, the message is sent to that user.



TAP/Modem device aspect will not work with a ZOOM USB modem.

Consider the following for reliable TAP/Modem device operation:

The modem selected should be fully supported by the operating system that is running the Messenger Server. Some modems may be partially supported by an operating system but may not correctly implement all of the required functions.

- The modem and driver must be at least TAPI 2.2 compliant.

- Only internal or RS-232 serial external modems should be used. USB modems or RS-232 modems being accessed through a USB/Serial converter should not be used. The USB drivers do not implement all of the modem control features necessary to communicate with the TAP provider. communicate with the TAP provider.

## Message Confirmation via GSM Compatible Device

When GSM compatible devices receive SMS event messages, users must reply to confirm that they received the message.

To confirm a received SMS message, either:

- Reply by returning the entire received SMS event message.
- Reply by returning the four-digit code number (Ack ID) found at the end of the received SMS event message.

The GSM confirmation stops Messenger from repaging. For all other devices, the alarm needs to be acknowledged to avoid repaging.



Although receipt of the SMS event message is confirmed, and the SMS event message is not sent to the next user in the destination list, receipt confirmation does not mean that the alarm is acknowledged in the Alarm and Event List on the operator console. For more information on alarm and event handling, including Alarm and Event Lists, see *System 800xA, Operations, Operator Workplace Configuration (3BSE030222\*)* and *System 800xA, Configuration (3BDS011222\*)*.

## SMS and E-mail Messaging Event Log Operation

The Messenger Event Log is a preconfigured Alarm and Event List that filters out everything but SMS and e-mail Messaging activity. It contains information on how many messages were successful, why a user did not receive a message (for example, they were not on schedule), and the reasons why a message was not successfully sent (for example, wrong PIN, service not accessible, modem not turned on, etc.). It also logs message receipt confirmation from GSM compatible devices that received the message via the SMS/GSM Device.



Message receipt confirmation is a simple event in the Messenger Event Log. It is not audited.

To access the Messenger Event Log:

1. Navigate to the Control Structure. The Root contains a Messenger object named, SMS and e-mail Messaging. Select this Messenger object.
2. Click on the Messenger Event Log in the Aspect List Area to view the Messenger Event Log in the Aspect Preview Area. [Figure 174](#) shows an example Messenger Event Log that includes message receipt confirmation (Received reply in the figure) from a GSM compatible device that received the message via the SMS/GSM Device aspect.



Event Time	LongMessage
01-Jul-2003 17:48:56	User CA\JASLATER Device SMS/GSM - Received reply (Ack ID:4ee8)
01-Jul-2003 17:40:56	User CA\JASLATER Device SMS/GSM - Sent (AckID:4ee6) - System3 07/01/03 17:40:56 A1 Bool Check.State.Alarm
01-Jul-2003 17:35:51	User CA\JASLATER Device SMS/GSM - Sent (AckID:1765) - System3 07/01/03 17:35:51 A1 Bool Check.State.Alarm
01-Jul-2003 17:20:25	User CA\JASLATER Device SMS/GSM - Received reply (Ack ID:41f0)
01-Jul-2003 17:14:51	User CA\JASLATER Device SMS/GSM - Sent (AckID:41f0) - System3 07/01/03 17:14:51 A1 Bool Check.State.Alarm
01-Jul-2003 17:10:35	User CA\JASLATER Device SMS/GSM - Received reply (Ack ID:15e7)
01-Jul-2003 17:08:00	User CA\JASLATER Device SMS/GSM - Sent (AckID:15e7) - james.slater@us.abb.com System3 07/01/03 17:08:00 A1 Bool C
01-Jul-2003 15:19:02	User CA\JASLATER Device SMS/GSM - Received reply (Ack ID:3838)
01-Jul-2003 15:14:11	User CA\JASLATER Device SMS/GSM - Sent (AckID:3838) - james.slater@us.abb.com System3 07/01/03 15:14:11 A1 Bool C
01-Jul-2003 12:52:58	User CA\JASLATER Device SMS/GSM - Received reply (Ack ID:6c7e)
01-Jul-2003 12:51:28	User CA\JASLATER Device SMS/GSM - Sent (AckID:6c7e) - james.slater@us.abb.com System3 07/01/03 12:51:24 A1 Bool C
01-Jul-2003 11:53:12	User CA\JASLATER Device SMS/GSM - Sent (AckID:40a0) - james.slater@us.abb.com System3 07/01/03 11:16:30 A1 Bool C
01-Jul-2003 11:50:06	User CA\JASLATER Device SMS/GSM - Sent (AckID:3e44) - james.slater@us.abb.com System3 07/01/03 11:16:30 A1 Bool C

Figure 174. Example Messenger Event Log



If the Messenger Event Log indicates that a message was sent but not received, verify that the SMS/GSM telephone number is correct and that text messaging is enabled. SMS/GSM does not give a correct error message for an invalid telephone number.



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# Section 11 Structured Data Logger

## SDL Data View

The SDL Data View has the following main functionalities:

- By default shows the records logged during the last 24 hours.
- Logs can be viewed for a specific interval. After changing the time interval click Get Data to view logs.
- The maximum number of records (0-999) retrieved can be set in the Max field. After changing Max value click Get Data to view logs.
- Click Refresh to set the current time and view the records.
- The Data View handles display of data even if properties are being added or removed subsequently. An added property will show up in the Data View as a new column with data from the time it was added. A removed property will retain its column in the Data View as long as the property is active during the specified time interval.
- All time values are displayed in local time, but they are stored as UTC values in Data Base.

Transport3 : SDL Log

Log Name: SDL Log

From: 6/1/2009 11:39:00 AM To: 6/8/2009 11:39:27 AM Max: 999 / 50 [Get Data] Refresh

OPCUTC	OPCQuality	Amount	Command	Destination	EngineeringUnit	Source
6/5/2009 1:21...	192	100	1	Silo3	kg	TruckOffLoadin...
6/5/2009 1:22...	192	100	2	Silo3	kg	TruckOffLoadin...
6/5/2009 3:40...	192	100	1	Silo3	kg	TruckOffLoadin...
6/5/2009 3:40...	192	100	2	Silo3	kg	TruckOffLoadin...
6/5/2009 3:41...	192	100	1	Silo3	kg	TruckOffLoadin...
6/5/2009 3:42...	192	100	2	Silo3	kg	TruckOffLoadin...
6/5/2009 4:19...	192	100	1	Silo3	kg	TruckOffLoadin...
6/5/2009 4:19...	192	100	2	Silo3	kg	TruckOffLoadin...
6/5/2009 4:21...	192	100	1	Silo3	kg	TruckOffLoadin...
6/5/2009 4:21...	192	100	2	Silo3	kg	TruckOffLoadin...
6/5/2009 4:30...	192	100	1	Silo3	kg	TruckOffLoadin...
6/5/2009 4:30...	192	100	2	Silo3	kg	TruckOffLoadin...
6/5/2009 4:32...	192	100	1	Silo3	kg	TruckOffLoadin...
6/5/2009 4:32...	192	100	2	Silo3	kg	TruckOffLoadin...
6/5/2009 4:40...	192	100	1	Silo3	kg	TruckOffLoadin...
6/5/2009 4:41...	192	100	2	Silo3	kg	TruckOffLoadin...
6/5/2009 4:42...	192	100	1	Silo3	kg	TruckOffLoadin...
6/5/2009 4:43...	192	100	2	Silo3	kg	TruckOffLoadin...
6/5/2009 4:51...	192	100	1	Silo3	kg	TruckOffLoadin...
6/5/2009 4:51...	192	100	2	Silo3	kg	TruckOffLoadin...
6/5/2009 4:53...	192	100	1	Silo3	kg	TruckOffLoadin...
6/5/2009 4:53...	192	100	2	Silo3	kg	TruckOffLoadin...
6/5/2009 5:01...	192	100	1	Silo3	kg	TruckOffLoadin...
6/5/2009 5:02...	192	100	2	Silo3	kg	TruckOffLoadin...
6/5/2009 5:03...	192	100	1	Silo3	kg	TruckOffLoadin...
6/5/2009 5:04...	192	100	2	Silo3	kg	TruckOffLoadin...
6/5/2009 5:12...	192	100	1	Silo3	kg	TruckOffLoadin...
6/5/2009 5:13...	192	100	2	Silo3	kg	TruckOffLoadin...
6/5/2009 5:14...	192	100	1	Silo3	kg	TruckOffLoadin...
6/5/2009 5:15...	192	100	2	Silo3	kg	TruckOffLoadin...

Figure 175. SDL Data View

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# Appendix A System Alarm Messages

The System alarms generated by System 800xA functions are described in [Table 15](#), [Table 16](#), [Table 17](#), [Table 18](#), [Table 19](#), [Table 20](#), [Table 21](#) grouped based on the System Functions:

- The Component column lists from where the system alarm originates. (The corresponding function area is listed within parenthesis).
- The Priority of the Alarm lists the priority associated with the alarm.
- The Message Description column lists short descriptions of system alarms. Text within % signs is replaced with the current data at run-time.
- The Extended description column explains system alarms further.



The System Alarms generated by Control are available in System 800xA Control 5.1 AC 800M Configuration user manual (3BSE035980\*).

## Operations

Table 15. Operations - System Alarms

Component	Priority Level	Short message Short description of the system alarm	Long message Extended description of the system alarm
AdvExtAlarm, AdvExtAIEngine (External Alarm)	1	Connection of AE subscr. failed	The External Alarm service failed to connect to an OPC Alarm&Event Server. This indicates that the External Alarm function in this node is not working.
AfwAlarmEvent (Alarm and Event)	1	Connection to OPC AE Server lost	The Alarm and Event service has lost contact with the OPC Alarm&Event Server in the specified node.
AfwAspDirSrv (Aspect Server/Aspect Directory)	1	Failed to open the aspect directory database files in <directory>.	Could not open the aspect directory database files. This indicates that the Aspect Directory in this node is not working.
AfwAspDirSrv (Aspect Server/Aspect Directory)	1	Failed to synchronize database, reason=<error code>	Failed to synchronize a backup Aspect Directory to the master Aspect Server. This indicates that the Aspect Directory in this node is not working.
AfwFsdServer (File Set Distribution)	2	FileSystemError	A file system operation failed. The operations could be open, remove, find, create and rename. The files involved are fileset files either on the client (in the FSD cache) or on the server.

Table 15. Operations - System Alarms (Continued)

Component	Priority Level	Short message Short description of the system alarm	Long message Extended description of the system alarm
AdvExtAlarm, AdvExtAIEngine (External Alarm)	1	Init of AE subscr. failed	The External Alarm service failed to connect to an OPC Alarm&Event Server. This indicates that the External Alarm function in this node is not working.
AdvExtAlarm, AdvExtAIEngine (External Alarm)	1	Initiation failed	Could not start the External Alarm Server due to severe problems in the system. This indicates that the External Alarm function in this node is not working.
AdvDsOPCServerAd apter (Data Subscription)	2	OPC DA Connect Failed	The Data Subscription service failed to connect to an OPC Data Access Server. This indicates that no OPC Data will be available from this node.
AdvDsOPCServerAd apter (Data Subscription)	1	OPC DA Server Error	The Data Subscription service has received a message from an OPC Data Access Server that it is in error. This indicates that no OPC Data will be available from this node.
AdvDsOPCServerAd apter (Data Subscription)	1	OPC DA Server Stopped	The Data Subscription service has lost contact with an OPC Data Access Server. This indicates that no OPC Data will be available from this node.
EventStorage	2	Resize failed: Disk Full	The Event Storage Server has failed to resize a storage, because of insufficient disk space. This indicates that no more events will be stored.

Table 15. Operations - System Alarms (Continued)

<b>Component</b>	<b>Priority Level</b>	<b>Short message Short description of the system alarm</b>	<b>Long message Extended description of the system alarm</b>
EventStorage	2	Resize failed: Unknown Error	The Event Storage Server has failed to resize a storage. This indicates that no more events will be stored.
AfwServiceManager (Service Manager)	1	Service provider entered error state	This indicates that the service provider on the specified node is not working.
AfwFsdServer (File Set Distribution)2	2	ServiceStartupError	Unable to start up the File Set Distribution Service. This can be caused by a file system error.
AfwPropertyTransfer (Property Transfer)	2	Write to property <Property> failed	The data point (PROPERTY) will not be updated
RNRP	2	Network Error	Primary network down
RNRP	2	Network Error	Secondary network down
RNRP	1	Network Error	Network down
Service	2	Service Provider Inoperative	Service Provider Inoperative
Service	1	Service Group Inoperative	Service Provider Inoperative



## Device Management Foundation Fieldbus

Table 16. Device Management FF - System Alarms

Component	Priority Level	Short message Short description of the system alarm	Long message Extended description of the system alarm
H1 device	2	H1 device not present	The H1 device is not in the live list
Linking device	2	LAS stopped	The cyclic communication of the H1 link is stopped.
Linking device	2	LAS not loaded	The LAS has no configuration I the H1 link
Linking device	2	H1 Link redundancy error	Different H1 devices are connected to the redundant orts of the H1 link
Linking device	2	Linking device not present	The linking device is not in the live list
Linking device	2	No secondary linking device	The live list contains no secondary linking device for a redundant pair
Linking device	2	No primary linking device	The live list contains no primary linking device for a redundant pair
Linking device	2	Two primary linking devices	The live list contains two primary linking devices for a redundant pair
Linking device	2	LD with active WEB server	The Web server of the linking device is active
Linking device	2	LD with default password	At least one user the default password is still used in the linking device

## Batch Management

Table 17. Batch Management - System Alarms

Component	Priority Level	Short message Short description of the system alarm	Long message Extended description of the system alarm
Batch	2	Starting Batch Server as Primary	The Batch Server application on the indicated node is being started and will act as the primary Batch Server.
Batch	2	Secondary Batch Server Failed, Primary Operation only	The indicated secondary Batch Server has failed. Only the primary Batch Server is still functioning so there is no redundancy.
Batch	2	Secondary Batch Server Started	The indicated Batch Server application is being started and it will function as a secondary Batch Server.
Batch	2	Restart process_name	The identified process (process_name) is being restarted.
Batch	1	ERROR: task task_name, hard failure	The identified task (task_name) has failed in such a manner that it cannot be restarted automatically.

## 800xA History

Table 18. 800xA History - System Alarms

Component	Priority Level	Short message Short description of the system alarm	Long message Extended message of the system alarm
AfwcPIMsSyncService	1	Connection to RTDB Lost	The connection between 800xA History Sync Service and the History Data Collector (RTDB) was lost.
AfwcPIMsSyncService	1	RTDB status change	Any change in status of History Data Collector (RTDB) services will be intimated through a System Alarm. The message description will change depending upon which service got impacted.

## PC, Network Software and Monitoring (PNSM)

Table 19. PC, Network Software Monitoring (PNSM) - System Alarms

Component	Priority Level	Short message Short description of the system alarm	Long message Extended message of the system alarm
Basic Computer Asset	1	Resource Alarm	The total computer free virtual memory as a percentage of the total available virtual memory. An actual value less than or equal to the configured limit will cause an alarm.
Basic Computer Asset	1	Resource Alarm	The total non-paged pool for a computer in Megabytes. An actual value greater than or equal to the configured limit will cause an alarm.
Basic Computer Asset	1	Resource Alarm	The free hard drive space in Megabytes. An actual value less than or equal to the configured limit will cause an alarm.
Basic Computer Asset	1	Resource Alarm	The sustained 2-minute average total CPU load as a percentage. An actual value greater than or equal to the configured limit will cause an alarm.
Light Computer Process Alarm	1	Process Status	Generates an alarm when a problem is detected with the process.

Table 19. PC, Network Software Monitoring (PNSM) - System Alarms (Continued)

<b>Component</b>	<b>Priority Level</b>	<b>Short message Short description of the system alarm</b>	<b>Long message Extended message of the system alarm</b>
Light Computer Process Alarm	1	Process Status	Provides summaries of the state of several key indicators within the process.
Light Computer Process Alarm	1	Process Status	Provides the values of several indicators within the process.

## 800xA for Advant Master

Table 20. 800xA for Advant Master - System Alarms

Component	Priority Level	Short message Short description of the system alarm	Long message Extended description of the system alarm
AdvDsMasterAdapter	1	Failed to create RTA Management Handler	The 800xA for Advant Master data service failed to connect to the RTA board Server. This indicates that no data from the controller(s) will be available through this Connectivity Server Node.
AdvDsMasterAdapter	1	Failed to initialize	Could not start the 800xA for Advant Master data service due to severe problems in the system. This indicates that no data from the controller(s) will be available through this Connectivity Server Node.
AdvMbAeOPCServer	1	No nodes available on MB300 network	No contact with the controller(s) on the MB 300 network. This indicates that no data from the controller(s) will be available through this Connectivity Server Node.
AdvMbTTDSrv	2	Failed to send data to client	The 800xA for AC 400 TTD Server has lost contact with a History Server. This indicates that no history data from the controller(s) will be logged from this Connectivity Server Node.
RTA_ManagementServer	1	RTA Board failed (stall) or RTA Board failed (connection lost)	The RTA Management Server has lost contact with the RTA board. This indicates that no data from the controller(s) will be available through this Connectivity Server Node.

Table 20. 800xA for Advant Master - System Alarms (Continued)

<b>Component</b>	<b>Priority Level</b>	<b>Short message Short description of the system alarm</b>	<b>Long message Extended description of the system alarm</b>
RTA_ManagementServer	1	RTA Board startup failed	This indicates that no data from the controller(s) will be available through this Connectivity Server Node.
RTA_ManagementServer	1	RTA Board startup failed (Network address not set)	This indicates that the Node and network address has not been configured on the RTA Board. No data from the controller(s) will be available through this Connectivity Server Node unless the address is set on the RTA Board.
RTA_ManagementServer	1	RTA Board Server stopped	The RTA Management Server has stopped
RTA_ManagementServer	2	PU410 line 1 connection lost	The connection to PU410 via Line 1 is lost
RTA_ManagementServer	2	PU410 line 2 connection lost	The connection to PU410 via Line 2 is lost

## Melody

Table 21. Melody: System Alarms

Component	Priority Level	Short message Short description of the system alarm	Long message Extended message of the system alarm
Melody controller	1	Task processing failure	While processing a task an error occurred.
Melody controller	1	Appl.-Task stopped	In a user task an error has occurred. The affected task can t be executed anymore and has been stopped. On modules of type PM 875 and CMC 70 only one task part will be stopped. All other task parts
Melody controller	2	Failure of n subscribers SA/L bus	An operating system error has been detected.
Melody controller	1	Message-transmit-queue full	Due to an overload of the module or of the bus messages (e.g. parameterizing, loading, messages) cant be transmitted in real time.
Melody controller	1	Message-receive-queue full	Due to an overload of the module or of the bus messages (e.g. parameterizing, loading, messages) can t be transmitted in real time.
Melody controller	2	Unknown object entered for BISOL	This error can only occur during the start of a module. The module has detected errors during initialization of the base functions.



Table 21. Melody: System Alarms (Continued)

Component	Priority Level	Short message Short description of the system alarm	Long message Extended message of the system alarm
Melody controller	3	Watchdog failure	On each module there is a type of hardware called watchdog that has to monitor the CPU. The CPU itself monitors the correct watchdog function. In this case the CPU has detected that the watchdog doesn't work faultless anymore.
Melody controller	3	Parity-logic failure	During each RAM access a special hardware circuit, the parity logic, checks whether the data that have been read are correct. The parity logic itself is cyclically checked by the CPU. In this case the CPU detected that the parity logic is out of order. The module is still OK but an important monitoring function failed.
Melody controller	3	Monitoring of non-existing memory failure	A special interrupt detects when the module is trying to access a not-existing memory area. The interrupt is cyclically checked by the CPU. In this case the CPU detected an error for this interrupt.

Table 21. Melody: System Alarms (Continued)

Component	Priority Level	Short message Short description of the system alarm	Long message Extended message of the system alarm
Melody controller	3	Mon. of write-protected memory failure	<p>In a module there are certain data that should not be modified during normal program execution. These data are saved in a memory area that is prohibited for writing access. If a program tries to write this prohibited memory area then a special interrupt will detect that. The CPU itself cyclically checks the monitoring function.</p> <p>In this case the CPU detected that the monitoring function failed. The module is still OK but an important monitoring function failed.</p>
Melody controller	3	Max. number of flash-update achieved	The maximum number of Flash programming cycles has been reached.
Melody controller	3	Exchange NV-RAM of the module	The maximum number of NVRAM-write-cycles has been reached. (In that case a write cycle is a voltage breakdown because only in that case the non-volatile area will be written).
Melody controller	3	Interface failure SSx (frontpanel)	The connection to the Engineering system via front panel is disturbed.
Melody controller	3	Transmission failure SSx (frontpanel)	The connection to the Engineering system via front panel interface is disturbed.

Table 21. Melody: System Alarms (Continued)

Component	Priority Level	Short message Short description of the system alarm	Long message Extended message of the system alarm
Melody controller	3	SSx; message buffer full	The connection to the Engineering system via front panel interface is disturbed.
Melody controller	1	Cnet(C) failure of n subscribers	<p>Cnet(C) Failure of n subscribers  Cnet(O2) Failure of n subscribers  All subscribers in the AB0-bus-subscriber list are disturbed.  Possible error cause may be:</p> <ul style="list-style-type: none"> <li>- all other modules on the AB0-bus are really disturbed</li> <li>- the AB0-bus interface of the module is defective</li> <li>- the connection to the other subscribers is defective</li> <li>- If there are 2 subscribers in total and one of them is disturbed.</li> </ul>

Table 21. Melody: System Alarms (Continued)

Component	Priority Level	Short message Short description of the system alarm	Long message Extended message of the system alarm
Melody controller	1	Cnet(SC) failure of n subscribers	Cnet(O) Failure of n subscribers Cnet(O1) Failure of n subscribers Cnet(SC) Failure of n subscribers All subscribers in the SC/O-bus-subscriber list are disturbed. Possible error cause may be: <ul style="list-style-type: none"> <li>- all other modules on the SC/O-bus are really disturbed</li> <li>- the SC/O-bus interface of the module is defective</li> <li>- the connection to the other subscribers is defective</li> </ul>
Melody controller	1	Cnet(C) failure of a unit	Cnet(C) Failure of a module Cnet(O2) Failure of a module The bus monitoring has detected a failure of a module on AB0. The message contains the mounting place position (EPC) of the disturbed module.

Table 21. Melody: System Alarms (Continued)

Component	Priority Level	Short message Short description of the system alarm	Long message Extended message of the system alarm
Melody controller	1	Cnet(SC) failure of a unit	Cnet(O) Failure of a module Cnet(O1) Failure of a module Cnet(SC) Failure of a module Cnet(SSC) Failure of a module The bus monitoring has detected a failure of a module on AB1. The message contains the mounting place position (EPC) of the disturbed module. In case that a module with 2 bus interfaces failed then there is a second message initiated from the second bus interface.

Table 21. Melody: System Alarms (Continued)

Component	Priority Level	Short message Short description of the system alarm	Long message Extended message of the system alarm
Melody controller	2	Passive line disturbed	<p>Only from Melody modules with predecessor bus interface: -0, -1 modules:</p> <p>On line B there is not any reception of master telegrams for &gt; 2.5s.</p> <p>The error is a defective channel on the module or a failure in the bus system [bus cabling]. This bus line is then completely disturbed. Due to the bus line redundancy the correct function of the module / of the bus system is not affected. Because this monitoring can only detect total failures there is a cross over of the internal bus lines A and B on the mounting place 09. Thus the physical line B on this module is also monitored by the monitoring function of line A.</p> <p>For modules of type -2 (e.g.CMC60-2, CCO30-2 etc.) the bus line B is monitored by the same bus monitoring functionality like bus line A. This way an internal cross over of the bus lines is not necessary.</p>
Melody controller	3	Transmission failure on active bus-line	<p>May be sporadic disturbances based on:</p> <ul style="list-style-type: none"> <li>- improper bus line connections or</li> <li>- on environmental influences or</li> <li>- on a line break.</li> </ul>

Table 21. Melody: System Alarms (Continued)

<b>Component</b>	<b>Priority Level</b>	<b>Short message Short description of the system alarm</b>	<b>Long message Extended message of the system alarm</b>
Melody controller	1	Error on communication-interface	An error for the Profibus-Interface, the Fnet-Interface or the Cnet-Interface has been detected that will not be indicated by another alarm. This error does not affect normal operation.
Melody controller	1	Error on communication-interface	An error for the Profibus-Interface, the Fnet-Interface or the Cnet-Interface has been detected that will not be indicated by another alarm. This error leads to the isolation of the corresponding interface.
Melody controller	1	Communication-interface failed	An error for the Profibus-Interface, the Fnet-Interface or the Cnet-Interface has been detected that will not be indicated by another alarm. This error leads to the isolation of the corresponding interface.
Melody controller	1	Communication-interface failed	An error for the Profibus-Interface, the Fnet-Interface or the Cnet-Interface has been detected that will not be indicated by another alarm. This error leads to the isolation of the corresponding interface.
Melody controller	1	Communication-interface failed	This alarm can only be initiated by hardware or software error on the Profibus interface.

Table 21. Melody: System Alarms (Continued)

<b>Component</b>	<b>Priority Level</b>	<b>Short message Short description of the system alarm</b>	<b>Long message Extended message of the system alarm</b>
Melody controller	1	Illegal interrupt	This alarm can only be initiated by a hardware error or a software error on the Profibus interface, the Fnet-Interface or the Cnet-Interface.
Melody controller	1	Watchdog active	This alarm can only be initiated by a hardware error or a software error on the Profibus interface, the Fnet-Interface or the Cnet-Interface.
Melody controller	1	Parity error	This alarm can only be initiated by a hardware error or a software error on the Profibus interface, the Fnet-Interface or the Cnet-Interface.
Melody controller	1	Memory check failure	It has been detected that a RAM cell in the Profibus interface, the Fnet interface or the Cnet interface is defective.
Melody controller	1	Busload > 90 %	It has been detected that the busload for the Profibus interface, the Fnet interface or the Cnet interface is higher than 90%.
Melody controller	1	Connection to Profibus failed	Failure of the connection or failure of all Profibus slaves of one line of the active (primary) Controller. The module executes a restart. If the error occurs three times within 10 minutes then the module isolates itself.



Table 21. Melody: System Alarms (Continued)

Component	Priority Level	Short message Short description of the system alarm	Long message Extended message of the system alarm
Melody controller	1	Connection to Profibus failed	The passive (backup) controller is the source of this message. The Profibus connection between the passive to the active (primary) controller has been failed.
Melody controller	1	No traffic on Profibus 0 line A	On Profibus 0 line A there is no bus traffic. (The line monitoring can be switched on or off in Composer) Possibly due to: - unplugged Profibus connector on plug 'DP0-A' - disconnected line A. - disconnection of the last slave on the line A.
Melody controller	1	No traffic on Profibus 0 line B	On Profibus 0 line B there is no bus traffic. (The line monitoring can be switched on or off in Composer) Possibly due to: - unplugged Profibus connector on plug 'DP0-B' - disconnected line B. - disconnection of the last slave on the line B.

Table 21. Melody: System Alarms (Continued)

Component	Priority Level	Short message Short description of the system alarm	Long message Extended message of the system alarm
Melody controller	1	No traffic on Profibus 1 line A	On Profibus 1 line A there is no bus traffic. (The line monitoring can be switched on or off in Composer) Possibly due to: - unplugged Profibus connector on plug ,DP1-A' - disconnected line A. - disconnection of the last slave on the line A.
Melody controller	1	No traffic on Profibus 1 line B	On Profibus 1 line B there is no bus traffic. (The line monitoring can be switched on or off in Composer) Possibly due to: - unplugged Profibus connector on plug ,DP1-B' - disconnected line B. - disconnection of the last slave on the line B
Melody controller	1	Flash memory - write error	The data cannot be written into the Flash memory of the module. This error can only occur during an update (boot loading) of a module.
Melody controller	1	Flash memory - erase error	The data cannot be erased in the Flash memory of the module. This error can only occur during an update (boot loading) of a module.

Table 21. Melody: System Alarms (Continued)

<b>Component</b>	<b>Priority Level</b>	<b>Short message Short description of the system alarm</b>	<b>Long message Extended message of the system alarm</b>
Melody controller	1	Flash memory - CRC error	The data in the Flash memory aren't correct anymore. The access to the Flash memory is blocked so that the module might not boot again after reset.
Melody controller	1	Task processing failure	During the loading of a task an error occurred.
Melody controller	1	Task processing failure	During the loading of a task an error occurred.
Melody controller	1	Task processing failure	During the loading of a task an error occurred.
Melody controller	1	Task processing failure	During the loading of a task an error occurred.
Melody controller	1	Task processing failure	During the loading of a task an error occurred.
Melody controller	1	Task processing failure	During the loading of a task an error occurred.
Melody controller	1	Unknown OP-Code	During the loading of a task an error occurred.
Melody controller	1	Sys.-modul-prog processing failure	Faulty or not-existing function module has been detected. E.g. the engineering system has loaded a function block module into the unit that is not supported by the software version.

Table 21. Melody: System Alarms (Continued)

<b>Component</b>	<b>Priority Level</b>	<b>Short message Short description of the system alarm</b>	<b>Long message Extended message of the system alarm</b>
Melody controller	1	UnknownSys.- modul-prog entered	Faulty or not-existing function module has been detected. E.g. the engineering system has loaded a function block module into the unit that is not supported by the software version.
Melody controller	1	Interpreter can not be started	The function interpreter could not be started due to an error.
Melody controller	1	Task processing failure	While processing a task an error occurred.
Melody controller	1	Task processing failure	While processing a task an error occurred.
Melody controller	1	Task processing failure	The transition an sequential function chart is defective.
Melody controller	1	Unknown OP- Code	The criteria numbering in a sequence chain is defective.
Melody controller	1	Task processing failure	While processing a task an error occurred.
Melody controller	0	Task processing failure	While processing a task an error occurred.
Melody controller	1	Cyclic redundance adjust disturbed	Capacity problems have been detected due to the high number of sequence chains in the function unit causing the balancing of a huge amount of data. Or there is a hardware failure on the controller module or the backplane.

Table 21. Melody: System Alarms (Continued)

Component	Priority Level	Short message Short description of the system alarm	Long message Extended message of the system alarm
Melody controller	1	Cyclic redundance adjust disturbed	Capacity problems have been detected due to the high number of sequence chains in the function unit causing the balancing of a huge amount of data. Or there is a hardware failure on the controller module or the backplane.
Melody controller	1	Read/write error for PVDB by task	An error occurred during writing or reading of an alphanumeric (process variable).
Melody controller	1	Transmit FIFO remains full	<p>1) Defective interface (Rupi, FIFO, ...)</p> <p>2) Overload of the bus network so that only few measuring values may be sent.</p> <p>3) To many transmit data available</p> <p><b>Note:</b></p> <p>The main CPU has detected that the bus interface processor doesn't collect the transmit data. Thus the FIFO that is working as data buffer between main CPU and interface processor remains full.</p>
Melody controller	1	Line A (B) disturbed	The bus interface processor has an error and the main CPU will reset it after three unsuccessful restart attempts.

Table 21. Melody: System Alarms (Continued)

Component	Priority Level	Short message Short description of the system alarm	Long message Extended message of the system alarm
Melody controller	3	Measured value(s) not actualized	A module or a pair of module is disturbed so that the measuring values cannot be sent anymore. <b>Note:</b> The module processes measuring values that are transmitted via bus from another module. These measuring values have not been actualized over a longer period.
Melody controller	3	Non defined couple status	During the coupling run an internal error has been detected. There was a try to enter an inadmissible status in the process variable database (PVDB).
Melody controller	3	Wrong parameter for PVDB access	During normal operation an internal error in the PVDB (process variable data base) occurred. An inadmissible parameter has been identified.
Melody controller	2	Max numb. marsh.-entries are attained	The total number of marshalling for a single alphanumeric (process variable) is too high. A process variable (an alphanumeric) should be marshalled to more than 60 drains.
Melody controller	2	Not possible to attach event-list elem.	The admissible memory area for an alarm/event typical is full.
Melody controller	2	Max. numb. event-list-elem. Attained	The reserved memory area for alarm & event typicals is full.

Table 21. Melody: System Alarms (Continued)

<b>Component</b>	<b>Priority Level</b>	<b>Short message Short description of the system alarm</b>	<b>Long message Extended message of the system alarm</b>
Melody controller	2	PVDB P-Channel already existing	On the Fnet there is doubled marshalling, i.e. a signal is marshalled twice via the bus. The marshalling of the measuring values is not affected but the busload increases.
Melody controller	2	Write protection-setting failure	Writing protection for the system-RAM-area could not be set again after a change
Melody controller	3	SS1; Service interface disturbed	The (rear sided) interface (SS1) has failed or the connection to the connected device has been disconnected.
Melody controller	1	Radio clock operation disturbed	The rear sided interface (SS1) has failed or the connection to the radio clock has been disconnected or the radio clock has failed.
Melody controller	2	SS1; Service interface disturbed	The (rear sided) interface (SS1) has failed or the connection to the connected device has been disconnected.
Melody controller	1	Task monitoring disturbed	The task monitoring could not be correctly installed.
Melody controller	1	Task monitoring failure	The task monitoring could not be correctly installed.

Table 21. Melody: System Alarms (Continued)

<b>Component</b>	<b>Priority Level</b>	<b>Short message Short description of the system alarm</b>	<b>Long message Extended message of the system alarm</b>
Melody controller	3	Battery error	The module has a buffer battery on behind the front panel to ensure the long time storage of the data. This battery voltage has fallen below the minimum threshold value. After power down the storage of the data cannot be guaranteed any longer.
Melody controller	3	Redundant buffering supply failure	Additionally to the battery in the front panel there is a redundant power supply for controller modules on the backplane. The voltage of this redundant voltage supply has fallen below a minimum threshold value. After power down and the failure of the front panel battery the storage of the data cannot be guaranteed any longer.
Melody controller	3	Power supply of cubicle disturbed	The voltage supply of the cabinet has partly failed. One power supply unit or one diode module has failed, or a fuse on the fuse card is blown.
Melody controller	3	Cubicle door open	The cabinet door has been opened for maintenance or the wiring to the door contact is defective.
Melody controller	3	Cubicle temperature out of range	The temperature in the cabinet is too high or the temperature sensor is defective.
Melody controller	2	Cubicle repeater failure	A repeater in the cabinet has failed.



Table 21. Melody: System Alarms (Continued)

<b>Component</b>	<b>Priority Level</b>	<b>Short message Short description of the system alarm</b>	<b>Long message Extended message of the system alarm</b>
Melody controller	1	CPU-load > 90%	The CPU load of the module has been higher than 90% for a longer period.
Melody controller	1	Runtime error system task	The system task that is named in the message could not be executed in time. Thus there was a runtime error of this task. The cause may be a too high CPU load or a disturbance in the module tasking.
Melody controller	1	Runtime error system task	The application task that is named in the message could not be executed in time. Thus there was a runtime error of this task. The cause may be a too high CPU load or a disturbance in the module tasking.
Melody controller	1	Time synchronisation failed	The module has not received any time synchronization telegram for a longer period.
Melody controller	2	system time delta not balanced	The module has not yet received the current time data (time zone, status bits, ...). It is very likely that the time synchronization is missing (see message ID: 2101).
Melody controller	1	Multiple time synchronisation	The module has detected that there is more than one source for the time synchronization.
Melody controller	3	Time of the master clock was set	The master clock has been manually changed.

Table 21. Melody: System Alarms (Continued)

<b>Component</b>	<b>Priority Level</b>	<b>Short message Short description of the system alarm</b>	<b>Long message Extended message of the system alarm</b>
Melody controller	1	Redundance take over failure	The active module fails during redundancy balancing.
Melody controller	1	Redundance take over	The module has changed its state from passive (backup) to active (primary).
Melody controller	2	Redundancy communication disturbed	The communication to the redundancy partner module is disturbed. Possible causes are a faulty bus connection, the failure of the redundancy link or the failure of the redundancy partner.
Melody controller	2	Redundancy link disturbed	The redundancy link has been disconnected.
Melody controller	2	Redundancy control failure	The primary (active) module can't lock the redundancy take over within the backup (passive) module. There is either an overload of the module or an overload of the bus.
Melody controller	3	No serviceblock is free	Overload of the service functions of the module because of too much simultaneous accesses (measuring, parameterization, simulation).
Melody controller	3	Not possible to attach service block	Overload of the service functions of the module because of too much simultaneous accesses (measuring, parameterization, simulation).
Melody controller	3	Received service was failed	A service function has been received as disturbed.

Table 21. Melody: System Alarms (Continued)

<b>Component</b>	<b>Priority Level</b>	<b>Short message Short description of the system alarm</b>	<b>Long message Extended message of the system alarm</b>
Melody controller	2	Internal object communication failure	A service function has been received as disturbed.
Melody controller	3	Transmission disturbed Fnet	A request from the controller to a local I/O module failed. The local I/O module was overloaded for a short time or there are disturbances on the Fnet.
Melody controller	2	Transmit FIFO full Fnet	The number of values to be transferred exceeds the Fnet capacity for a short time.
Melody controller	1	Transmit FIFO remains full Fnet	If there is subsequently three times the message 2510 "Transmit FIFO full Fnet" then this message will be sent. By a message burst or by multiple marshalling (one value is assigned to too many output modules) then not all values can be transmitted in real time.
Melody controller	1	Communication disturbed Fnet	The interface processor to the Fnet (RUPI, ASIC or FPGA) is not available during the booting of the module. There is a hardware problem of the module.
Melody controller	1	Communication disturbed Fnet	All local I/O modules (in case of CMC 50: all active local I/O modules) failed. Or the bus connection is disturbed.
Melody controller	1	Input signals from I/O-modules not refreshed	An interpreter error in the Fnet master has been detected.

Table 21. Melody: System Alarms (Continued)

<b>Component</b>	<b>Priority Level</b>	<b>Short message Short description of the system alarm</b>	<b>Long message Extended message of the system alarm</b>
Melody controller	2	Data inconsistency between RAM and FLASH	During the automatic check of the configuration data the controller has detected an inconsistency between the data in the working memory (SDRAM) and the non volatile memory (FLASH-Memory).
Melody coupler	2	Event generation disabled	Within the coupling module of type CCO the event generation is disabled. This function allows the suppression of messages of an area during commissioning.
Melody coupler	3	ETH0 Communic. decreased (CRC)	The data traffic via Onet (Ethernet) is often disturbed. The module detected several CRC-errors within a short period.
Melody coupler	1	ETH0 Communi. critical (CRC)	The data traffic via Onet (Ethernet) is often disturbed. The module detected several CRC-errors within a short period.
Melody coupler	3	ETH0 Communic. decreased (CD)	The data traffic via Onet (Ethernet) is often disturbed. The module detected several CRC-errors within a short period.
Melody coupler	1	ETH0 Comm. critical (CD)	The data traffic via Onet (Ethernet) is often disturbed. The module detected multiple collisions within a short period.
Melody coupler	1	ETH0 Network connection failed	The passive (backup) CCO 30 doesn't receive test messages anymore.

Table 21. Melody: System Alarms (Continued)

Component	Priority Level	Short message Short description of the system alarm	Long message Extended message of the system alarm
Melody Fnet	1	I/O module failed	I/O module can t be accessed via Fnet. Possible reason: - Power supply failed CUW - detected both Fnet-lines disturbed
Melody Fnet	2	Transmission I/O module/Controller (A) disturbed	The Fnet-Master has three times unsuccessfully tried to request the I/O module on Fnet line A. Possible reason: - I/O module transmitter / Fnet line A defective - Fnet Master receiver / Fnet line A defective - Fnet line A defective
Melody Fnet	2	Transmission I/O module/Controller (B) disturbed	The Fnet-Master has three times unsuccessfully tried to request the I/O module on Fnet line B. Possible reason: - I/O module transmitter / Fnet line B defective - Fnet Master receiver / Fnet line B defective - Fnet line B defective
Melody Fnet	1	Time synchronisation missing on Fnet	The time synchronization is started with the linking of the first I/O module. The cause for this alarm is a failure of the time synchronization, i.e. the Fnet-Master has not received any time synch telegrams for more than 10sec.

Table 21. Melody: System Alarms (Continued)

<b>Component</b>	<b>Priority Level</b>	<b>Short message Short description of the system alarm</b>	<b>Long message Extended message of the system alarm</b>
Melody Fnet	1	I/O module message buffer full	The Fnet-Master transmit message buffer is full! This is a short time disturbance based on a temporary overload.
Melody IEC61850	1	IEC61850 Interface- ISS does not launch	The IEC 61850 communication stack does not launch.
Melody IEC61851	2	IEC61850 Interface- Major Error	This concerns a common alarm, which summarizes different problems concerning the IEC 61850 stack communication.
Melody IEC61852	3	IEC61850 Interface- Minor Error	This concerns a common alarm, which summarizes different events with an informative character.
Melody IEC61853	1	IEC61850 Connection to all IED failed	Interruption of the IEC 61850 Ethernet line
Melody Local I/O	3	Exchange NV-RAM of the module	The NVRAM of the module has been written more than 9000 times after power down. The NVRAM lifespan has nearly been reached.

Table 21. Melody: System Alarms (Continued)

Component	Priority Level	Short message Short description of the system alarm	Long message Extended message of the system alarm
Melody Local I/O	2	Transmission Controller-I/O module (A) disturbed	<p>The Fnet-Master has three times unsuccessfully tried to request the I/O module on Fnet line A.</p> <p>Possible reason:</p> <ul style="list-style-type: none"> <li>- I/O module transmitter / Fnet line A defective</li> <li>- Fnet Master receiver / Fnet line A defective</li> <li>- Fnet line A defective</li> </ul>
Melody Local I/O	2	Transmission Controller-I/O module (B) disturbed	<p>Communication Controller / I/O-module Fnet line B disturbed. The I/O module doesn't receive any telegrams on Fnet line B from the controller anymore.</p> <p>Possible reason:</p> <ol style="list-style-type: none"> <li>1. Transmitter of the Controller Fnet line B is defective.</li> <li>2. Receiver of the I/O module Fnet line B is defective.</li> <li>3. Fnet bus line B interrupted.</li> </ol>

Table 21. Melody: System Alarms (Continued)

Component	Priority Level	Short message Short description of the system alarm	Long message Extended message of the system alarm
Melody Local I/O	1	Hardware failure or telegram type wrong	<p>In case that AC 870P / Melody transmits the system message “Hardware failure or telegram type wrong” to Operations, this is necessarily not an error, neither the fact that a message has been generated nor the reason why this message has been initiated.</p> <p>The message type has originally been created to monitor the communication processes between Fnet-slave and Fnet-master. In case that during a communication there is a disturbance in the sequence of the communication process then the Fnet-slave sends the system message “Hardware failure or telegram type wrong” together with additional information. This additional information helps to find causes of a disturbance (in case of an analysis).</p> <p>A disturbance can only be stated after accumulated alarms. In this case the life monitoring detects additionally the failure of a signal path and reacts corresponding to the invalidity strategy, partial disturbance signaling, entries in error registers and signaling of disturbances. In case of sporadic occurrence of the system message this leads to single loss of a value that will be refreshed during the following cyclic transmit operation.</p>



Table 21. Melody: System Alarms (Continued)

Component	Priority Level	Short message Short description of the system alarm	Long message Extended message of the system alarm
			The long term experience of AC 870P / Melody has shown that the system Hardware failure or telegram type wrong " only occurs as sporadic message.
Melody Local I/O	1	Function code not admissible	The slave doesn't support the function code Different meaning of the error code
Melody Local I/O	1	Address not in valid range	Within the configuration of the CCF 10 / CCF 10-P an address out of the valid area has been selected.
Melody Local I/O	1	Value not admissible for the address	The denoted value is invalid depending on the denoted address.
Melody Local I/O	2	Device cannot answer anymore	A MODBUS subscriber is disturbed.
Melody Local I/O	2	Answer at the moment not possible	The module currently does not get any response from the requested MODBUS subscriber.
Melody Local I/O	2	Answer momentary not poss., request ok	The module doesn't receive momentary any answer from the requested MODBUS subscriber even though the request has been acknowledged.
Melody Local I/O	1	Input-ZSP memory is written twice	There has been an error in writing the transfer memory (ZSP) on the module.

Table 21. Melody: System Alarms (Continued)

<b>Component</b>	<b>Priority Level</b>	<b>Short message Short description of the system alarm</b>	<b>Long message Extended message of the system alarm</b>
Melody Local I/O	2	Overflow of the event buffer	In the third-party system a high number of event messages occurred.
Melody Local I/O	1	Invalid Input-ZSP memory in the event buffer	An invalid transfer memory address has been entered in the event buffer.
Melody Local I/O	3	Configuration fault: Init data	In the CCF 10 / CCF 10-P configuration errors occurred.
Melody Local I/O	3	Configuration fault: Read function	In the CCF 10 / CCF 10-P configuration errors occurred.
Melody Local I/O	3	Configuration fault: Write function	In the CCF 10 / CCF 10-P configuration errors occurred.
Melody Local I/O	3	Timeout for answer	The requested subscriber on the MODBUS has not responded in the defined monitoring time.
Melody Local I/O	3	Answer with undefined fault	The subscriber on the MODBUS has answered with an unknown error code.
Melody Local I/O	1	Device disturbed	The third-party system failed.
Melody Local I/O	3	FS- Module not available (any more)	Alarm text has been generated by third-party system.
Melody Local I/O	3	FS- Max. subscriber number (6) exceeded	Alarm text has been generated by third-party system.
Melody Local I/O	4	FS- Subscriber cancelled/deleted	Alarm text has been generated by third-party system.

Table 21. Melody: System Alarms (Continued)

<b>Component</b>	<b>Priority Level</b>	<b>Short message Short description of the system alarm</b>	<b>Long message Extended message of the system alarm</b>
Melody Local I/O	3	FS- Incorrect coupling mode	Alarm text has been generated by third-party system.
Melody Local I/O	5	FS- Block no./block name not found	Alarm text has been generated by third-party system.
Melody Local I/O	3	FS- Reception list/block disabled	Alarm text has been generated by third-party system.
Melody Local I/O	2	FS- Reception data block too small	Alarm text has been generated by third-party system.
Melody Local I/O	2	FS- Action against write protection	Alarm text has been generated by third-party system.
Melody Local I/O	2	FS- Data transfer failed	Alarm text has been generated by third-party system.
Melody Local I/O	1	FS- Bus failed	Alarm text has been generated by third-party system.
Melody Local I/O	2	FS- Bus coupler failed/disturbed	Alarm text has been generated by third-party system.
Melody Local I/O	2	FS- Bus coupler (Transm. puffer full)	Alarm text has been generated by third-party system.
Melody Local I/O	2	FS- Bus coupler (Reception puffer full)	Alarm text has been generated by third-party system.
Melody Local I/O	3	Incorrect measurement telegram length	The real data telegram length differs from the configured data telegram length.

Table 21. Melody: System Alarms (Continued)

<b>Component</b>	<b>Priority Level</b>	<b>Short message Short description of the system alarm</b>	<b>Long message Extended message of the system alarm</b>
Melody Local I/O	3	Monitoring time is elapsed	The measuring value has not been received within the monitoring time TU (that has been adjusted within the receive function block).
Melody Local I/O	3	Timeout in case of announcing	The establishment of the connection for a measuring value to the third-party system is impossible.
Melody Local I/O	2	Doubled time synchronization in FS	If for the module 3964(R)/N-V.24 T_SYN=1 and a time synchronization telegram has simultaneously been received from the Third-party system.
Melody Local I/O	3	Interface overloaded	Within 5 seconds CCF 10 / CCF 10-P could not reach a transmit release. (STX/DLE).
Melody Local I/O	2	Interface failed	CCF 10 / CCF 10-P hasn t received a STX ('Start of Text') for at least 10 seconds.
Melody Local I/O	3	Send fifo : Frame too short	An error in the FIFO of CCF 10 / CCF 10-P has been detected.
Melody Local I/O	3	Send fifo : Frame too long	An error in the FIFO of CCF 10 / CCF 10-P has been detected.
Melody Local I/O	3	Send fifo : wrong frame checksum	An error in the FIFO of CCF 10 / CCF 10-P has been detected.

Table 21. Melody: System Alarms (Continued)

<b>Component</b>	<b>Priority Level</b>	<b>Short message Short description of the system alarm</b>	<b>Long message Extended message of the system alarm</b>
Melody Local I/O	2	MODBUS disturbance	There isn't any stable data connection between the MODBUS-subscribers. - 20 % of the received frames are defective. - Bad cable quality, - missing terminating resistors, etc.
Melody Local I/O	2	MBM Storage fault	An hardware error has been detected on the module.
Melody Local I/O	2	Voltage Uv has failed	One voltage supply Uv 1, Uv2 or Uv3 failed
Melody Local I/O	3	Contact bias has failed	A hardware error on the I/O module regarding the generation of the negative voltage has been detected.
Melody Local I/O	1	Error in configuration data	The module CTI 20 has an error in the configuration data.
Melody Local I/O	3	Line break transmitter/signal line	Line break of field device or signal line. (The sum of device resistance and line resistance exceed the threshold value that depends on the measuring value and that is in the range of 3,5 kOhm up to 1
Melody Local I/O	3	Short-circuit transmitter/signal line	Short circuit of resistance or signal line connected to CTI 20. The sum of resistance and signal line resistance has been fallen below the threshold of 50 Ohm.

Table 21. Melody: System Alarms (Continued)

<b>Component</b>	<b>Priority Level</b>	<b>Short message Short description of the system alarm</b>	<b>Long message Extended message of the system alarm</b>
Melody Local I/O	3	Reference junction disturbed	The channel with the measuring for the reference junction temperature has detected an error (invalid measuring of the reference temperature) OR The reference temperature measuring is working correct but the measured reference temperature differs more the configured temperature difference (TOLT) from the adjusted set value for the reference temperature (REFT).
Melody Local I/O	2	Redundancy balance disturbed	Disturbance of the CAC 10 partner in redundancy (backup module).
Melody Local I/O	1	Unknown OP-Code	A software error has been detected.
Melody Local I/O	1	Data type error	A software error has been detected.
Melody Local I/O	2	Stack error	A software error has been detected.
Melody Local I/O	2	Division by 0	A software error has been detected.
Melody Local I/O	2	Arithmetic overflow error	A software error has been detected.
Melody Local I/O	2	Overflow of meas. value transmit buffer	The Fnet transfer capacity has been temporarily exceeded, due to the high number of signals to be transferred. (message bursts)
Melody Local I/O	3	Receive fifo: Frame too short	An error in the FIFO of CCF 10 / CCF 10-P has been detected.

Table 21. Melody: System Alarms (Continued)

<b>Component</b>	<b>Priority Level</b>	<b>Short message Short description of the system alarm</b>	<b>Long message Extended message of the system alarm</b>
Melody Local I/O	3	Receive fifo : Frame too long	An error in the FIFO of CCF 10 / CCF 10-P has been detected.
Melody Local I/O	3	Receive fifo : wrong frame checksum	An error in the FIFO of CCF 10 / CCF 10-P has been detected.
Melody Local I/O	2	MBM not running	Reaction on other errors (e.g. errors during loading, wrong interface parameter, ...) Hardware error.
Melody Local I/O	3	Positioning loop AUT disturbance	Despite positioning commands sent, the actuator does not change the position to the desired direction or not with the required minimum speed.
Melody Local I/O	3	Positioning loop MAN disturbance	Despite a local operation has been done the actuator position does not change to the desired direction or nor with the required minimum speed. Without operation the positioner changes its position.
Melody Local I/O	3	Positioning loop AUT disturbance	Despite positioning commands sent, the actuator does not change the position to the desired direction or not with the required minimum speed.
Melody Local I/O	3	Positioning loop AUT disturbance	Despite positioning commands sent, the actuator does not change the position to the desired direction or not with the required minimum speed.

Table 21. Melody: System Alarms (Continued)

<b>Component</b>	<b>Priority Level</b>	<b>Short message Short description of the system alarm</b>	<b>Long message Extended message of the system alarm</b>
Melody Local I/O	3	Positioning loop MAN disturbance	Despite a deviation in position the pneumatic drive running in manual mode does not change the position to the desired direction or not with the required minimum speed.
Melody Local I/O	3	Positioning loop in MAN with act block.	The positioner moves without any command.
Melody Local I/O	3	Output circuit is interrupted	The circuit for the output signal IA is disconnected.
Melody Local I/O	3	Electronic power unit failed	Loss of release signal F10.
Melody Local I/O	3	Parallel card failed	The release signal F8 of the parallel module (XM13) is lost. The module has failed or the signal line has been disconnected.
Melody Local I/O	3	External error EXT	Via binary input EXST_REL a disturbance has been indicated e.g. coming from the substation automation.
Melody Local I/O	3	Torque switch in "+" dir. before +RM	The drive/actuator has been blocked in intermediate position, the end position switch has failed.
Melody Local I/O	3	Torque switch in "-" dir. before -RM	The drive/actuator has been blocked in intermediate position, the end position switch has failed.



Table 21. Melody: System Alarms (Continued)

Component	Priority Level	Short message Short description of the system alarm	Long message Extended message of the system alarm
Melody Local I/O	3	Max value exceeded	The signal coming from the transmitter is higher than the configured maximum value. - Short circuit of the transmitter - Transmitter is defective
Melody Local I/O	3	Fallen below min value	The signal coming from the transmitter is lower than the minimum value. - Line break of the transmitter loop - Short circuit of the transmitter loop to ground/mass - Transmitter is defective
Melody Local I/O	3	External release missing	The fuse module of a 4-wire-transmitter has detected a violation of the admissible transmitter supply current (too high / too low) and as a consequence set the external release signal to 0.
Melody Local I/O	3	Valence error CLOSED = N.CLOSED	The monitoring for the binary input of the position feedback RM0 of the aggregate has detected an error: - Valence monitoring (RM0=RM0/=0 or 1) - Line break, mass connection or connection to 24 V of the wiring.

Table 21. Melody: System Alarms (Continued)

Component	Priority Level	Short message Short description of the system alarm	Long message Extended message of the system alarm
Melody Local I/O	3	Valence error OPEN = N.OPEN	The monitoring for the binary input of the position feedback RM1 of the aggregate has detected an error: - Valence monitoring (RM1=RM1/=0 or 1) - Line break, mass connection or connection to 24 V of the wiring.
Melody Local I/O	3	Valence error OPEN=CLOSED	The valence monitoring has detected an error RM0=RM1=0 or 1. - Line break, mass connection or connection to 24 V of the wiring. - End position switch for OPEN/CLOSE is defective. - Inputs have not been wired yet.
Melody Local I/O	3	Val. err. of torque sw. for OPEN=CLOSED	The valence monitoring has detected an error DR0=DR1=0. - Line break or M-connection of both lines. - Inputs have not been wired yet.
Melody Local I/O	3	External disturbance EXST	The binary input EXST has indicated a disturbance e.g. coming from substation automation (switch gear). Probable causes are: - Overcurrent of the motors. - The external fuse has blown.

Table 21. Melody: System Alarms (Continued)

Component	Priority Level	Short message Short description of the system alarm	Long message Extended message of the system alarm
Melody Local I/O	3	Disturbance of transmitter supply UVG	The power supply monitoring has detected an error. - Line break or M-connection (connection to ground) of the power supply lines.
Melody Local I/O	3	Disturbance of command line BEF0	The command line monitoring for command 0 has detected an error. - Line break, mass connection or connection to 24 V of the command lines. - Break of the coupling relay coil. - Outputs have not been wired yet.
Melody Local I/O	3	Disturbance of command line BEF1	The command line monitoring for command 1 has detected an error. - Line break, mass connection or connection to 24 V of the command lines. - Break of the coupling relay coil. - Outputs have not been wired yet.
Melody Local I/O	3	Valence error OFF = N.OFF	The monitoring for the binary inputs for feedback signal RM0 of the aggregate has detected an error. - Valence monitoring (RM0=RM0/=0 or 1) - Line break, mass connection or connection to 24 V of the wiring.

Table 21. Melody: System Alarms (Continued)

Component	Priority Level	Short message Short description of the system alarm	Long message Extended message of the system alarm
Melody Local I/O	3	Valence error ON = N.ON	The monitoring for the binary inputs for feedback signal RM1 of the aggregate has detected an error. - Valence monitoring (RM1=RM1/=0 or 1) - Line break, mass connection or connection to 24 V of the wiring.
Melody Local I/O	3	Valence error of acknowledgements ON=OFF	Valence monitoring RM0=RM1=0 or 1. - Line break, mass connection or connection to 24 V of the wiring. - The end switch for ON/OFF is defective - Inputs have not been wired yet.
Melody Local I/O	3	External disturbance EXST	The binary input EXST has indicated a disturbance e.g. coming from substation automation (switch gear). Probable causes are: - Overcurrent of the motors. - The external fuse has blown
Melody Local I/O	3	Disturbance of transmitter supply	The power supply monitoring has detected an error. - Line break or M-connection (connection to ground) of the power supply lines - temporary all inputs for drive related transmitters on L-potential

Table 21. Melody: System Alarms (Continued)

Component	Priority Level	Short message Short description of the system alarm	Long message Extended message of the system alarm
Melody Local I/O	3	Disturbance of command line BEF0	The command line monitoring for command 0 has detected an error. - Line break, mass connection or connection to 24 V of the command lines. - Break of the coupling relay - Outputs have not been wired yet.
Melody Local I/O	3	Disturbance of command line BEF1	The command line monitoring for command 1 has detected an error. - Line break, mass connection or connection to 24 V of the command lines. - Break of the coupling relay - Outputs have not been wired yet.
Melody Local I/O	3	Valence error OPEN = CLOSED	The valence monitoring indicates RM0=RM1=0 or RM0=RM1=1. - Line break, mass connection or connection to 24 V of the wiring. - End position switch for OPEN/CLOSE is defective. - Inputs have not been wired yet.
Melody Local I/O	3	External disturbance EXST	The binary input EXST has indicated a disturbance e.g. coming from substation automation (switch gear). Probable causes are: - Overcurrent of the motors. - The external fuse has blown.

Table 21. Melody: System Alarms (Continued)

Component	Priority Level	Short message Short description of the system alarm	Long message Extended message of the system alarm
Melody Local I/O	3	Disturbance of command line BEF1	The command line monitoring for command 1 has detected an error. - Line break, mass connection or connection to 24 V of the command lines. - Break of the coupling relay (coil). - Outputs have not been wired yet.
Melody Local I/O	3	Valence error OPEN = CLOSED	The valence monitoring indicates RM0=RM1=0 or RM0=RM1=1. - Line break, mass connection or connection to 24 V of the wiring. - End position switch for OPEN/CLOSE is defective. - Inputs have not been wired yet.
Melody Local I/O	3	External disturbance EXST	The binary input EXST has indicated a disturbance e.g. coming from substation automation (switch gear). Probable causes are: - Overcurrent of the motors. - The external fuse has blown.
Melody Local I/O	3	Disturbance of command line BEF1	The command line monitoring for command 1 has detected an error. - Line break, M-connection (connection to ground) or +24V-connection of the command line. - Outputs have not been wired yet.

Table 21. Melody: System Alarms (Continued)

<b>Component</b>	<b>Priority Level</b>	<b>Short message Short description of the system alarm</b>	<b>Long message Extended message of the system alarm</b>
Melody OPC Server	1	No Connection to %1	The Melody OPC Server could not establish a connection to the CCO.
Melody OPC Server	1	No connection configured for %1	The CCO has been configured as unavailable. No connections are established.
Melody Profibus	1	Profibus: failure of a subscriber	The slave cannot be accessed via bus. The slave has not responded to a repeated request of the master.
Melody Profibus	3	Profibus: parameter fault	Message of a slave after configuration, e.g.: identity number or user parameter wrong. The last parameter telegram that the slave received was faulty.
Melody Profibus	3	Profibus: configuration fault	Message of a slave after configuration. The last configuration data that the slave has received differ from those that the slave has identified, e.g.: module structure is not matching to the configuration data.
Melody Profibus	3	Profibus: diagnosis data exist	Slave diagnostic data are available which can not be analyzed by the master because these data eventually are not conform to the Profibus DP standard or the master has is overloaded.
Melody Profibus	1	Profibus: bus address available twice	A bus address exists at least twice. Two slaves in a Token Ring have the same address.

Table 21. Melody: System Alarms (Continued)

<b>Component</b>	<b>Priority Level</b>	<b>Short message Short description of the system alarm</b>	<b>Long message Extended message of the system alarm</b>
Melody Profibus	1	Profibus: MAC-error	Error on Controller hardware (e.g.: defective driver). The Medium-Access-Controller (MAC) on the bus-ASIC indicates an error.
Melody Profibus	1	Profibus: failure of bus interface	Error on Controller hardware (ASIC error). The Profibus-ASIC (ASPC2) indicates a hardware error.
Melody Profibus	3	Profibus: reserved	Channel related error (acc. to DIN 19245-3: error type 0 / reserved) The error has been created by the slave and passed through the system.
Melody Profibus	3	Profibus: short-circuit	Channel related diagnostic message of the slave (acc. to DIN 19245-3: error type 1). The error has been created by the slave and passed through the system.
Melody Profibus	3	Profibus: undervoltage	Channel related diagnostic message of the slave (acc. to DIN 19245-3: error type 2). The error has been created by the slave and passed through the system.
Melody Profibus	3	Profibus: overvoltage	Channel related diagnostic message of the slave (acc. to DIN 19245-3: error type 3). The error has been created by the slave and passed through the system.



Table 21. Melody: System Alarms (Continued)

Component	Priority Level	Short message Short description of the system alarm	Long message Extended message of the system alarm
Melody Profibus	3	Profibus: overload	Channel related diagnostic message of the slave (acc. to DIN 19245-3: error type 4). The error has been created by the slave and passed through the system.
Melody Profibus	3	Profibus: over temperature	Channel related diagnostic message of the slave (acc. to DIN 19245-3: error type 5). The error has been created by the slave and passed through the system.
Melody Profibus	3	Profibus: line break	Channel related diagnostic message of the slave (acc. to DIN 19245-3: error type 6). The error has been created by the slave and passed through the system.
Melody Profibus	3	Profibus: higher limit-value exceeded	Channel related diagnostic message of the slave (acc. to DIN 19245-3: error type 7). The error has been created by the slave and passed through the system.
Melody Profibus	3	Profibus: lower limit-value exceeded	Channel related diagnostic message of the slave (acc. to DIN 19245-3: error type 8). The error has been created by the slave and passed through the system.

Table 21. Melody: System Alarms (Continued)

<b>Component</b>	<b>Priority Level</b>	<b>Short message Short description of the system alarm</b>	<b>Long message Extended message of the system alarm</b>
Melody Profibus	3	Profibus: error	Channel related diagnostic message of the slave (acc. to DIN 19245-3: error type 9). The error has been created by the slave and passed through the system.
Melody Profibus	3	Profibus: reserved	Channel related diagnostic message of the slave (acc. to DIN 19245-3: error type 10). The error has been created by the slave and passed through the system.
Melody Profibus	3	Profibus: reserved	Channel related diagnostic message of the slave (acc. to DIN 19245-3: error type 11). The error has been created by the slave and passed through the system.
Melody Profibus	3	Profibus: reserved	Channel related diagnostic message of the slave (acc. to DIN 19245-3: error type 12). The error has been created by the slave and passed through the system.
Melody Profibus	3	Profibus: reserved	Channel related diagnostic message of the slave (acc. to DIN 19245-3: error type 13). The error has been created by the slave and passed through the system.

Table 21. Melody: System Alarms (Continued)

<b>Component</b>	<b>Priority Level</b>	<b>Short message Short description of the system alarm</b>	<b>Long message Extended message of the system alarm</b>
Melody Profibus	3	Profibus: reserved	Channel related diagnostic message of the slave (acc. to DIN 19245-3: error type 14). The error has been created by the slave and passed through the system.
Melody Profibus	3	Profibus: reserved	Channel related diagnostic message of the slave (acc. to DIN 19245-3: error type 15). The error has been created by the slave and passed through the system.
Melody Profibus	3	Profibus: unknown channel-related error	Group message for manufacturer specific channel related diagnostic messages of a slave. This alarm will not be sent anymore as from version CSV 1.45! The error has been created by the slave and passed through the system.
Melody Profibus	3	Profibus: module-related error	The alarm is related to an error on the module of a slave. The controller sends this group message in case that the slave has detected an error.
Melody Profibus	3	Profibus: No connection to backup slave	The connection to the redundant slave (backup slave) is not available. Possible causes are: - Unplugged modules - Defective modules - Disconnected lines
Melody Profibus	2	Number of Profibus SOE signals too high	Number of Profibus SOE signals too high

Table 21. Melody: System Alarms (Continued)

<b>Component</b>	<b>Priority Level</b>	<b>Short message Short description of the system alarm</b>	<b>Long message Extended message of the system alarm</b>
Melody Profibus	2	Configuration error regarding Profibus SOE signal	Configuration error regarding Profibus SOE signal
Melody Profibus	2	Wrong data type from Profibus DPV2 slave	The Profibus DPV2 slave sends wrong data

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## Appendix B Priority Levels for Process Alarms and System Alarms

Table 22. Priority Levels for Process Alarms

Process Alarms	Priority Level	Description	Example
Critical	1	Requires immediate operator action to not cause human health- or safety problems, plant shut-down or environment upset.	Risk for trip of major equipment (compressors, extruders etc.).
High	2	Requires immediate operator action to prevent the activation of a safety or process critical interlock. The operator action can prevent process shutdown an/or escalation of product problems.	Too high/low temperature, pressure, level etc. that will activate interlocks that lead to process shutdown.

Table 22. Priority Levels for Process Alarms (Continued)

Process Alarms	Priority Level	Description	Example
Medium	3	All alarms where operations have to intervene quickly to prevent process upset or quality loss.	These alarms are important during normal operations but may not disturb the operator during upsets where corrective action is required on critical alarms.
Low	4	All Alarms where no fast intervention is required but where the operator is requested to perform some actions as part of his normal task.	To inform the operator that a valve is switched, a motor is started or stopped, a failing instrument, the evolution of some quality parameters etc.

Table 23. Priority Levels for System Alarms

System Alarms	Priority Level	Description	Example
Critical	1	Requires immediate system maintenance action to not cause System 800xA shut down.	Loss of Aspect Directory, corrupt memory etc.
High	2	Requires immediate system maintenance actions to prevent parts of the System 800xA from stop functioning.	Loss of communication, faulty I/O module etc.

Table 23. Priority Levels for System Alarms (Continued)

<b>System Alarms</b>	<b>Priority Level</b>	<b>Description</b>	<b>Example</b>
Medium	3	All system alarms where system maintenance has to intervene quickly to guarantee System 800xA availability, reliability and to prevent system 800xA upsets.	Loss of redundancy. Loss of redundant controller unit, redundant communication link, redundant connectivity server. These system alarms are important during normal system runtime but may not disturb the system maintenance during upsets where corrective action is required on fatal problems.
Low	4	All system alarms where no fast intervention is required but where the system maintenance is requested to perform some actions as part of their normal tasks. Also used for informational messages (only exception to the rule is that alarms always require an action to be taken)	Faulty I/O channel or process signal. Example of an informational message is a condition of the plant that the operator should be aware of and take into account in further decisions, although the condition itself does not require any action to be taken.





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## Appendix C VB Process Graphics



This appendix describes the old Visual Basic based Process Graphics (VBPG). Process Graphics and the VBPG can co-exist in parallel in the same system.

Visual Basic based Process Graphics is used to show displays of an area of the plant. Graphic displays are built from static and dynamic graphic elements. Static elements represent background information like pipes or conveyer belts and so on and do not normally change. Dynamic elements represent process objects and are used to present information from the process or to perform actions on the process.

A dynamic graphic element is highlighted when the pointer is placed on it, see [Figure 176](#). A tooltip shows the name of the object represented by the element. The context menu for the object is presented if the right mouse button is pressed. By left-clicking on the object, the default aspect in the context menu is presented. Typically the default aspect is a faceplate.

If a dynamic graphic element supports object locking, it is surrounded by a white frame (see [Figure 185](#)) when the object is locked by a user. Refer to [Header](#) on page 312.

The context menu for an aspect object may include trend or alarm displays for the object. Refer to [Context Menu](#) on page 57.

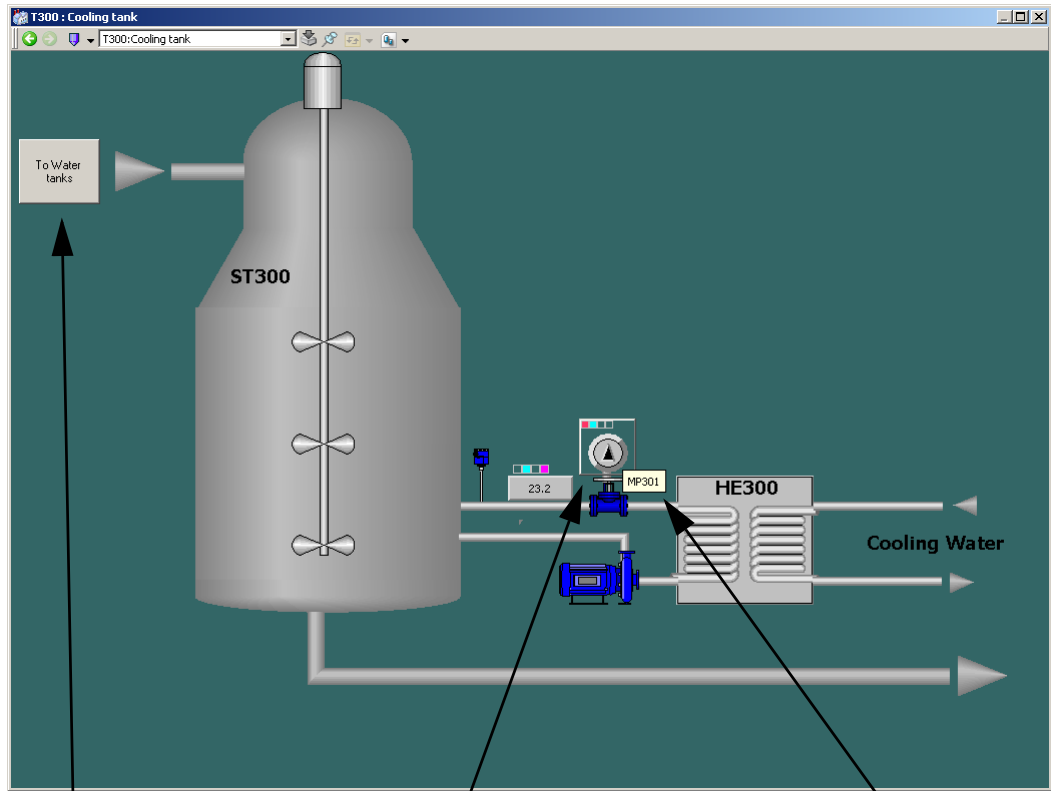
A faceplate is used by the operator to view the status of an aspect object (for example, a process I/O) or to interact with it, refer to [Faceplates](#) on page 309.

Display links are dynamic graphic elements that are used to invoke other VB Process Graphics displays.

VBPG is displayed in the display area of the Operator Workplace on the screen. It may be displayed as a basic display covering the entire display area or as a pop-up display.

As a summary, with VBPG the Operator can:

- Supervise the process
- Highlight dynamic elements by placing the pointer on them
- Control the process via faceplates
- Change display to another graphic display or alarm or trend display via display links
- Display alarm or trend displays via context menus for the objects



Click here to go to another display.

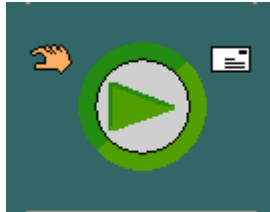
Left-click here to open up a faceplate. Right-click to open context menu.

Tooltip

Figure 176. Process Display

## Display Elements

Display elements are dynamic graphic elements that represent real process objects, such as a motor or a valve, refer to [Figure 177](#).



*Figure 177. Example of a Display Element for a Motor*

In the center of the element there is a representation of the relevant process object. This is usually a symbol representing the object, for example a symbol of a valve, motor, or tank. There may also be text.

The symbols in the corners show object alarms, object mode, object status and other information about the object, for example if there are any Operator Notes for the object. Refer to [Symbols in Display Elements](#).

If there is more than one alarm for the object, then only the most severe alarm state will be shown.

## Symbols in Display Elements

The table below shows some examples of symbols that appears in display elements and faceplates. For more symbols, refer to [Appendix D, Icons and Symbols](#).

Table 24. Symbols in Display Elements












Example Appearance	Example Description
	<p>There are Operator Notes for the object. Refer to <a href="#">Operator Note</a> on page 318.</p>
	<p>Object is run automatically by the system.</p>
	<p>Object is controlled manually.</p>
	<p>Object is interlocked. Interlocks are used to lock out a process object from certain states during a time period. For example, a motor can either run or be stopped. If the motor cannot be run due to repairs, then the motor is interlocked and can not be started.</p>
	<p>Off The object is turned off.</p>

Table 24. Symbols in Display Elements (Continued)

Example Appearance	Example Description
	<p>On The object is turned on.</p>
	<p>Status information box. The Status Information box. Position 1 - Alarm (Red) A flashing light indicates an unacknowledged alarm. Position 2 - Manual Mode (Blue) Position 3 - Forced Mode (Yellow) Position 4 - Local/Internal Mode (Purple) For example, Position 4 can be used to indicate Local mode for a motor and Internal mode for a regulator.</p>

Display Elements can show controller communication status, refer to [Table 25](#), on top of themselves. The indication is shown if a value is bad or uncertain. When the value is good, the indication is invisible.

Table 25. Controller Communication Status Indication

Symbol	Description	Example
	<p>Status is uncertain. Values and information from the controller can not be trusted. Contact your system support.</p>	
	<p>Status is bad. No contact with the controller. Contact your system support.</p>	

## Group Display

A Group Display is a convenient way to view several faceplates for different process objects at the same time, refer to [Figure 178](#).



Figure 178. Example of a Group Display

# Quad Display

The Quad Display is a special configuration of a group display. The Quad Display makes it possible to toggle between the main view of the four aspects and a full screen view of any of the aspects by using the Zoom tool in the toolbar. See Figure 179.

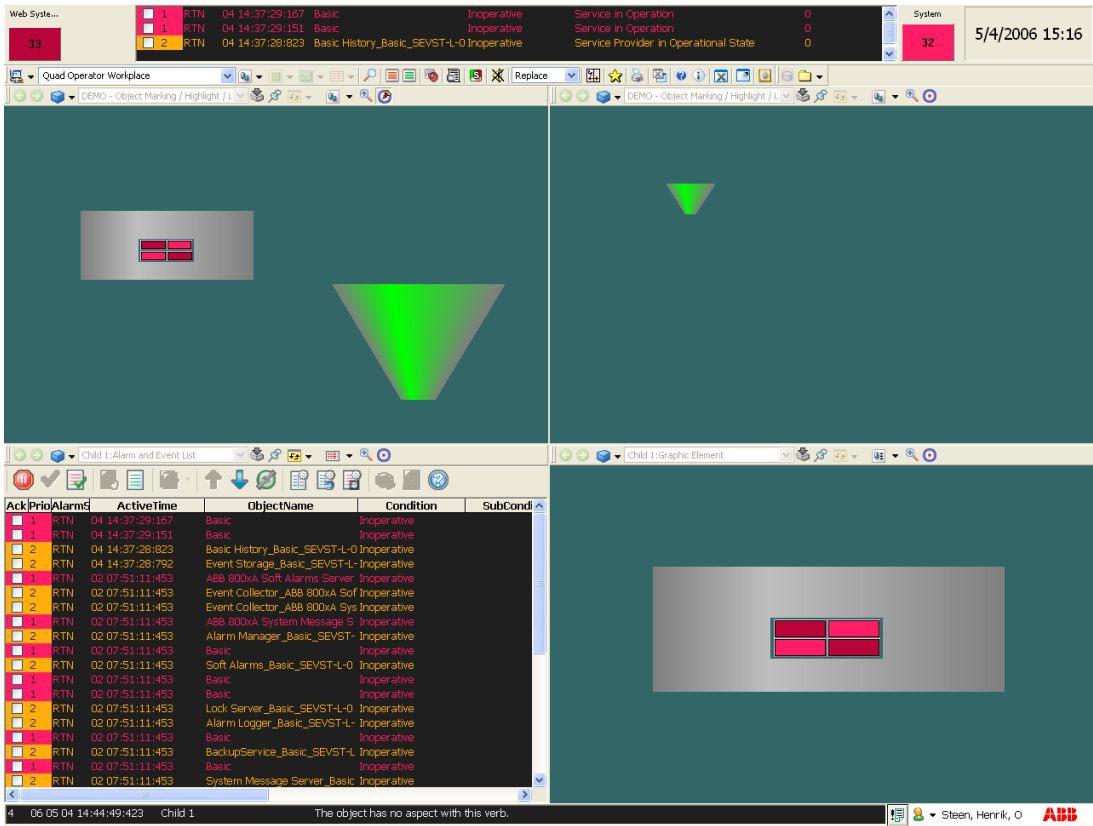


Figure 179. Example of a Quad Display



## Faceplates

A Faceplate is a process dialog for supervision and control. Icon and symbols shown in faceplates are described in [Appendix D, Icons and Symbols](#).

The faceplates can e.g. be opened in the following ways:

- From a process display by left-clicking on the process object (graphic element).
- By entering (or selecting) the object name in the Object Shortcut Tool, see [Application Bar](#) on page 22.

If you have several faceplates open at the same time in your graphic display you can see which faceplate that are in focus by locating the graphic element that is highlighted and surrounded by blue corner brackets. See [Figure 180](#).

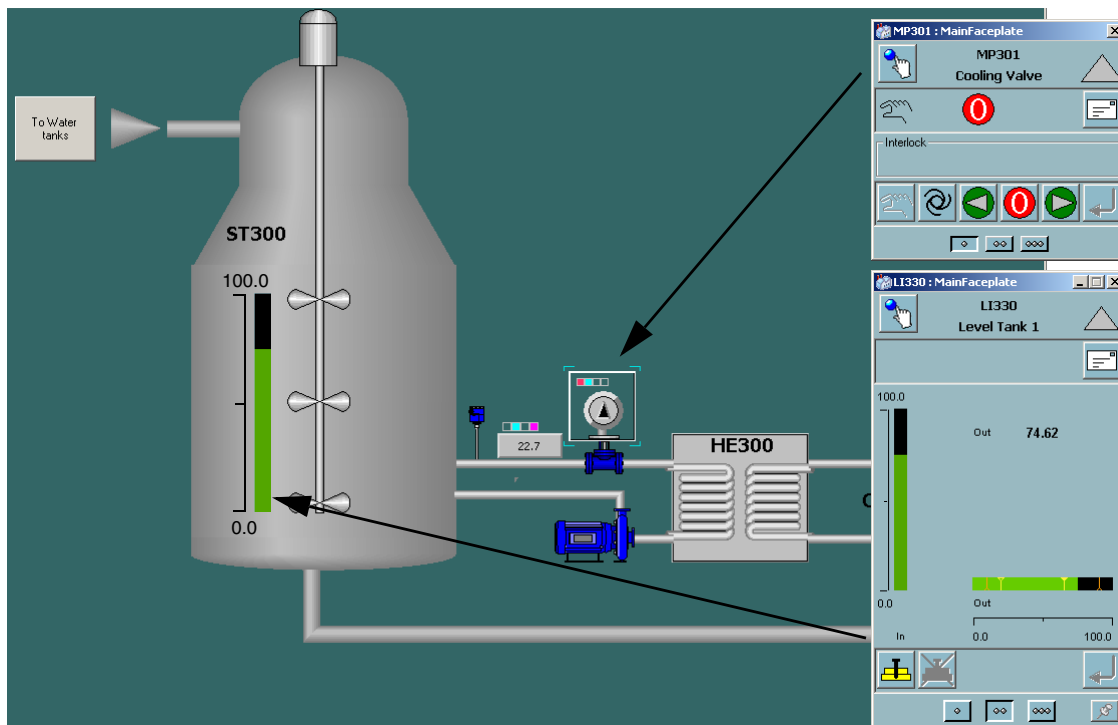


Figure 180. Graphic Display with Faceplates

A faceplate can have up to three different views. Possible views are:

- **Reduced View.** This view is optimized to be as small as possible, and yet cover the most used commands and the most important information on an object.
- **Faceplate View.** This is usually the default view. It is larger than the reduced faceplate, and contains more information and normal operator commands.
- **Extended View.** This view usually has two groups of tabs with additional process information and functionality. This view is used to display the maximum amount of information and is intended for the process engineer or the advanced operator.

The active Faceplate view is indicated at the bottom of the Faceplates, the corresponding **view selection** button is pressed. A non-existing view has the corresponding view selection button disabled.

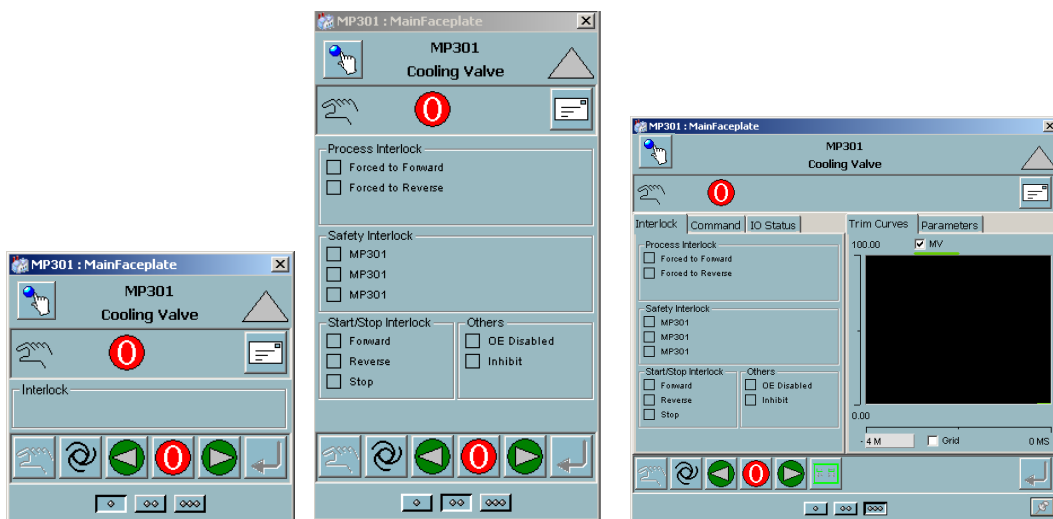


Figure 181. Reduced Faceplate and Faceplate View and Extended Faceplate

## Signal Faceplate

When using signal faceplates you can manually set a value by using the force button. Click the force button and enter your chosen value. See [Figure 182](#).

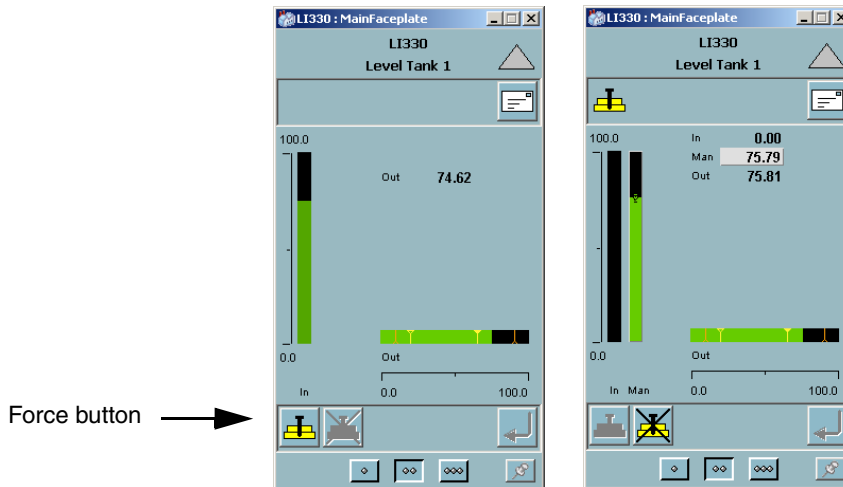




Figure 182. Example of Signal Faceplates

## Overview and Interaction

The faceplates are divided into several areas. The different areas and how to use them are described in this section.

- 

Using faceplates often mean that you change a value or a mode for a process object. Some process critical operations may require an approval for the operation. An approval dialog appears, prompting for User ID and password. See [Approval \(Authentication\)](#) on page 37 for more information about approval.
- 

If **Highlight Follows Faceplate Focus** is selected as highlight mode, hot keys are available for the invocation. See [Hot Keys](#) on page 55 for more information.

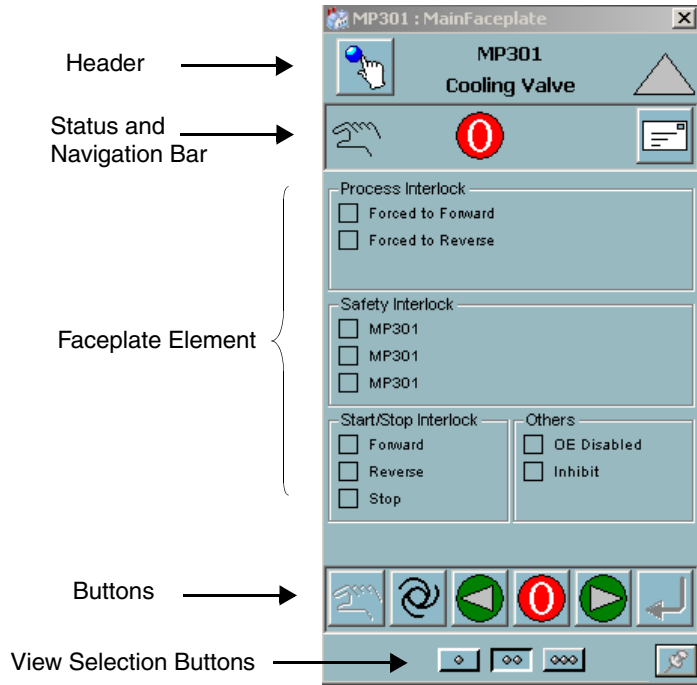


Figure 183. Faceplate Terminology



The different views of a Faceplate affect the size or look of the Status and Navigation bar, the Faceplate element area and the Button area.

**Header**

The header is included in each Faceplate. It consists of the following parts:

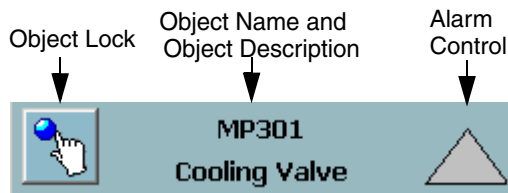


Figure 184. Example of a Header Area

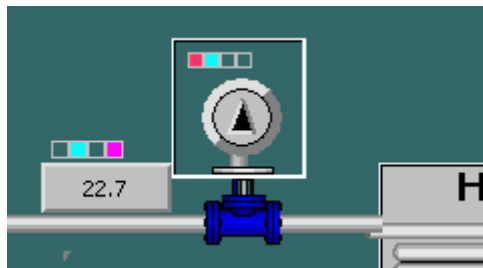
- **Object Lock**



Object Lock is enabled if the Lock Server function is configured. See *System 800xA, Administration and Security (3BSE037410\*)* for more information.

Object lock will give the user the sole right to operate an object. If Autolock is enabled the object will be locked from the moment the user opens up the faceplate. If the object lock function is controlled manually, the user has to take the lock by clicking the **Object Lock** button to be able to operate the object. In some cases the lock required option may be enabled, all buttons and commands will then be dimmed until the user clicks the Object Lock button.

The object lock button indication is according to [Table 26](#). The graphic element (in the graphic display) is surrounded by a white frame to indicate that the object is locked, see [Figure 185](#).






*Figure 185. Example of a Locked Graphical Element*

An object that is locked by another user is indicated as a flat button and yellow icon, see [Table 26](#). A tooltip with information about who has locked the object and from which node is shown if the mouse pointer is placed on the object lock button in the faceplate. No operation on the object is possible when locked by another user.

The table below shows the different object lock states and their corresponding indications.

Table 26. Lock States Displayed in the Object Lock.

Lock status	Button	Icon	Background Color
Unlocked	Raised		Bluegrey
Locked by me	Sunken		White
Locked by [name of the user who locked]	Flat		Yellow

When the object is released by somebody else, the button changes from flat to raised and it turns bluegrey. To lock the object simply press the button.

Possible ways to release a lock on an object, is to either click the lock button or to close the faceplate. In case of inactivity of operation action in the faceplate, there is a specific time-out period until the object lock is released.

- **Object Name** displays the primary name of the object. If the width of the **Name** area is not wide enough to display the full name this is indicated by three dots, "...", at the end of the visible text. A tooltip will always show the whole name, when the pointer is positioned above the name.
- **Object Description** displays the description of the object, and the tooltip works the same way as in the name area.
- **Alarm Status** indicates the alarm state and allows to acknowledge the object alarms from the faceplate by clicking the alarm status button. See [Table 27](#) for a list of alarm indications.

### Status and Navigation Bar

The left side shows status indicators of the current object status. Shortcuts to other aspect views of the object are displayed to the right, for example Operator Note.



Figure 186. Example of Status and Navigation Bar Area

### Element Area

The faceplate element area in Figure 187 contains two tab groups with the displayed faceplate elements Interlock and TrimCurve.

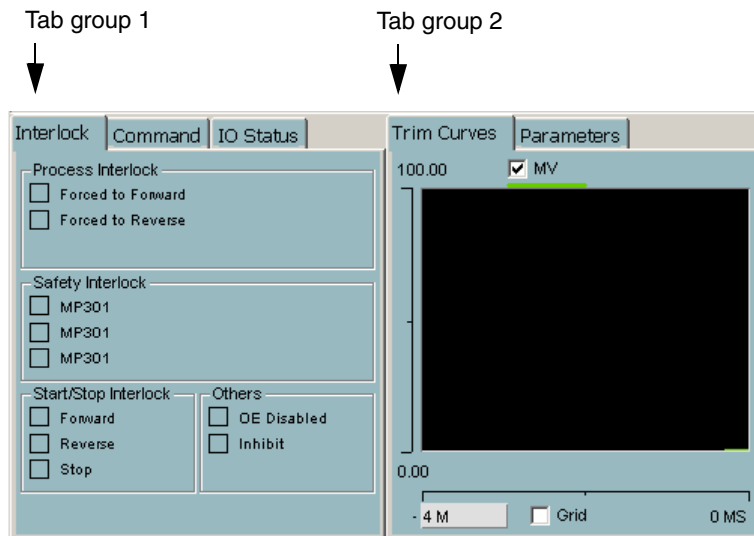
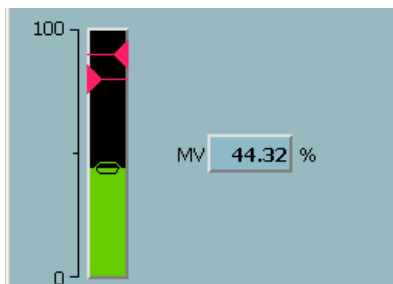


Figure 187. Example of a Faceplate Element Area

The faceplate element area can also contain graphic information as shown in [Figure 188](#).



*Figure 188. Faceplate Element with Bargraph*

- **Bargraph**  
The bargraph displays an object property value. You can modify the value by dragging the handle.
- **Numeric presentation window**  
Displays the value of some object property.
- **Direct entry window**  
Open the handle via a click in the bargraph, or in the numeric presentation. Modify the data in the direct entry window by:
  - Manually enter the value in the direct entry window.
  - Click the Up and Down arrows) in the direct entry window.  
This changes the value to a smaller range (1%).
  - Use the up and down arrow keys on the keyboard.  
This changes the value to a smaller range (1%).
  - Use the Page Up and Page Down keys on the keyboard.  
This changes the value more (10%), than the two previous alternatives.  
Apply the value:

Click the **Apply** button, or press **Enter** on the keyboard.

Cancel and close the direct entry window (there are several ways):

Press the **Esc** key on the keyboard, or click in a neutral area on the side, within the faceplate.

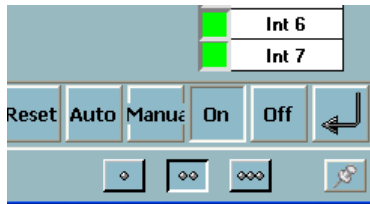


## Buttons

Buttons that control properties of the object are shown in the **Button** area.

See [Table 28](#) for examples of buttons.

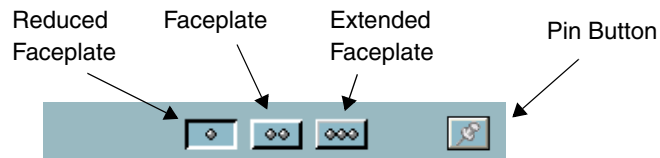
Click buttons to operate the object, for example change mode. When you click a button, the effect on the object can, depending on configuration, be direct or applied. Direct means that the effect is performed directly when you click the button. If the action is applied the button appears to be pressed down and the **Apply** button is activated, see **On** button in [Figure 189](#). You have to click the **Apply** button or press **Enter** for the operation to take effect.



*Figure 189. Applied Action Button*

## View Selection Buttons

These buttons, see [Figure 190](#), enable you to select one of the three Faceplate views. If a view does not exist, the button representing that view is disabled. The current view is indicated by a pressed button.



*Figure 190. View Selection Buttons*

A pinned faceplate will not be replaced when opening a new faceplate. The new faceplate will be opened in a separate window.

## Operator Note

An Operator Note is a message to another operator or a note about an object, in order to remember information about it.



Clicking on the symbol, in the faceplate, opens a window where you can read and write notes regarding the object. You can also access the Operator Note from the context menu.

If the object does not have a note, you can add one from the context menu by choosing **Add Note**.

The dialog for Operator Note is a basic text editor. Write the note and click **Apply**.

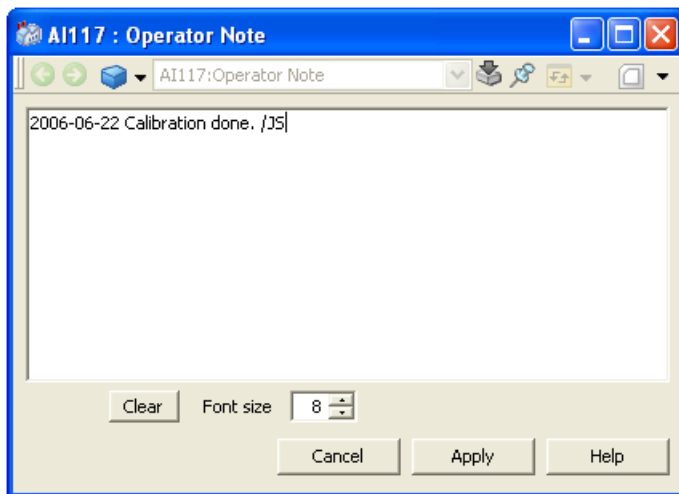


Figure 191. The Operator Note

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## Appendix D Icons and Symbols

This appendix lists the most common icons and symbols used in faceplates and Graphics elements included in the Standard Faceplate for 800xA for AC 800M.

### Alarm Indicators

Table 27 show the most common alarm indicators.

Table 27. Alarm Indicators











Icon	Description
	Alarm can be acknowledged.
	Alarm is active and acknowledged.
	Alarm is active, but not acknowledged.
	Indicates illegal alarm configuration.

Table 27. Alarm Indicators

Icon	Description
	Alarm is automatically disabled by the system.
	Alarm disabled by a user.
	Alarm is idle, that is there are no alarms.
	Alarm is neither active, nor acknowledged.
	Hidden Alarm. A white rectangle covering an alarm symbol, shows that there are hidden alarms for the object.
	Shelved Alarm. A white circle appearing to the right of the alarm symbol shows that there are shelved alarms for the object.

## General Symbols

Table 28 shows examples of symbols that can be found on faceplate buttons and as indicators in Graphics elements.

Table 28. Other Symbols









Icon	Description
	Apply
	Disabled. Something in the object is disabled.
	Down
	Forward
	High
	Increase
	Internal. Internal set point is used instead of an external set point.
	Left

Table 28. Other Symbols (Continued)

















Icon	Description
	Low
	Object is controlled manually.
	Object is set to be run automatically by the system.
	Operator Note. See <a href="#">Operator Note</a> on page 81 for more information about Operator Note.
	Object is interlocked. Interlocks are used to lock out a process object from certain states during a time period. For example, a motor can either run or be stopped. If the motor cannot be run due to repairs, then the motor is interlocked and can not be started.
	Pause
	Reverse
	Right

Table 28. Other Symbols (Continued)




Icon	Description
	Start
	Stop
	Status is uncertain. This symbol on top of a graphic element shows that controller communication status is uncertain.
	Status is bad. This symbol on top of a graphic element shows that controller communication status is bad.
	Value is forced by a user.
	Unforce
	Undo
	Up

Feature Pack Functionality

---

Table 29 shows the graphic elements that are used for AC 800M Status Monitoring. For more information, refer to [AC 800M Status Monitoring](#) on page 100.

Table 29. Graphic Elements

Icon	Description
	Hardware Unit status is Good.
	Hardware Unit Status is Warning.
	Hardware Unit Status is Error.

---



## Asset Condition Reporting Icons

See *System 800xA, Asset Optimization, Operation (3BUA000150\*)* for information on AO Asset Condition Reporting.

Table 30. Asset Tree Severity Indicator Icons <sup>(1)</sup>








Icon	Severity	Description
	<b>None</b>	<b>None:</b> No Asset Reporter or Asset Monitor associated with the asset. Asset Monitor is disabled or has never been downloaded, or Asset Monitor has never run for this object.
	<b>Blank</b>	<b>Normal:</b> No maintenance required.
	<b>Low 1 to 100</b>	<b>Maintenance:</b> Maintenance required <b>soon</b> to avoid functional restrictions, e.g. caused by a nearly exhausted wear reserve or operational conditions.
	<b>Low 101 to 250</b>	<b>Maintenance:</b> Maintenance required <b>now</b> to avoid functional restrictions, e.g. caused by a nearly exhausted wear reserve or operational conditions.
	<b>Medium: 251 to 500</b>	<b>Out of specification:</b> Asset is operating outside specified limits, caused by internal problems or process characteristics.

Table 30. Asset Tree Severity Indicator Icons (Continued)<sup>(1)</sup>

Icon	Severity	Description
	<b>High:</b> <b>501 to 750</b>	<b>Function check:</b> Asset functionality might be temporarily restricted, due to ongoing work on the asset, e.g. as local operation, maintenance, simulation, or a function check.
	<b>Critical:</b> <b>751 to 1000</b>	<b>Failure:</b> Asset functionality lost due to malfunction in the asset itself or its peripherals.

(1) Severity is defined by an increasing loss of device health and functionality.

Table 31. Quality Indicator Overlay Icons

Icon	Description
None	Good quality.
	Uncertain quality.
	Bad quality.

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# Revision History

## Introduction

This section provides information on the revision history of this User Manual.



The revision index of this User Manual is not related to the 800xA 5.1 System Revision.

## Revision History

The following table lists the revision history of this User Manual.

<b>Revision Index</b>	<b>Description</b>	<b>Date</b>
-	First version published for 800xA 5.1	June 2010
A	Updated for 800xA 5.1 Feature Pack 1	August 2011
B	Updated for 800xA 5.1 Revision B	June 2012
C	Updated for 800xA 5.1 Feature Pack 3	August 2012
D	Updated for 800xA 5.1 Feature Pack 4	February 2013
E	Updated for 800xA 5.1 Revision E and Feature Pack 4 Revision E	July 2015
F	Minor text updates in Appendix A, System Alarm Messages, for 800xA 5.1 Revision E and Feature Pack 4 Revision E	July 2015

## Updates in Revision Index A

The following table shows the updates made in this User Manual for 800xA 5.1 Feature Pack 1.

Updated Section/Sub-section	Description of Update
About this User Manual	Added a section <i>Feature Pack</i> describing the user manual conventions used for indicating the Feature Pack content.
Section 6, Alarms and Events	Added the sections <i>Alarm Grouping</i> and <i>Alarm Response Navigation</i> .
Section 9 SFC Viewer	<p>The following new topics are added under the sub-section <i>Transition Display</i>:</p> <ul style="list-style-type: none"> <li>• Configuration Settings for Displaying the Default View for Transition</li> <li>• Dynamic Colors for Project Constant Used in Transition Criteria</li> </ul> <p>The following new topics are added under the sub-section <i>Action Display</i>:</p> <ul style="list-style-type: none"> <li>• Configuration Settings for Displaying the Default View for Action</li> <li>• Action Display with Target Diagram Reference Name and Description</li> </ul> <p>The following new topics are added under the sub-section <i>Object Navigation</i>:</p> <ul style="list-style-type: none"> <li>• Object Navigation for Structured Data Type Variables</li> <li>• Object Navigation for Structured Data Types through Communication/Global Variable</li> <li>• SFC Uploader Aspect</li> <li>• Display of Actual Tag Name when Using Structured Data Types</li> </ul>

## Updates in Revision Index B

The following table shows the updates made in this User Manual for 800xA 5.1 Revision B .

Updated Section/Sub-section	Description of Update
Section 9 SFC Viewer	Added a section <i>SFC Debug Mode</i> .

## Updates in Revision Index C

The following table shows the updates made in this User Manual for 800xA 5.1 Feature Pack 3.

Updated Section/Sub-section	Description of Update
Section 9 SFC Viewer	Added the sections <i>Configuration Settings for Displaying the Whole Structure for Transition</i> , and <i>Configuration Settings for Displaying the Auto Scroll for Transition</i> .

## Updates in Revision Index D

The following table shows the updates made in this User Manual for 800xA 5.1 Feature Pack 4.

Updated Section/Sub-section	Description of Update
Section 6 Alarms and Events	Added a new section <i>AC 800M Status Monitoring Tool</i> .
Appendix A System Alarm and Event Messages	Added the details of <i>ITPNSMMonitoring(PC, Network software and monitoring)</i> in the table.

## Updates in Revision Index E

The following table shows the updates made in this User Manual for 800xA 5.1 Revision E and Feature Pack 4 Revision E.

Updated Section/Sub-section	Description of Update
Appendix A System Alarm and Event Messages	Updated with information on alarm priority and descriptions grouped based on the system functions.

## Updates in Revision Index F

The following table shows the updates made in this User Manual for 800xA 5.1 Revision E and Feature Pack 4 Revision E.

Updated Section/Sub-section	Description of Update
Appendix A System Alarm and Event Messages	Minor updates to the introductory text and added a reference to the System Alarms in Controls.

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