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About This User Manual

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 user manual is intended for the operators of a process plant.

This user manual 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.

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.
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.
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
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 Workplace from the ABB Start Menu. For information on accessing the ABB Start Menu, refer to System 800xA Tools (2PAA101888*).

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

When launching a Workplace, you must enter the login credentials if both logover functionality and Windows UAC Security are enabled in the system.

Two variations of multiple screen workplaces are also available, the Multi-Screen Workplace and the Large Workplace. Refer to Multiple Screens on page 34.
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.

In addition to the standard workplaces there is also a setup called System 800xA Extended Operator Workplace (EOW) which consists of pre-configured workplaces with multiple screens for three clients and is operated from a high performance operator desk.

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 shown in Figure 4.

**Figure 4. Application Bar**

<table>
<thead>
<tr>
<th>Legend</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Alarm Band</td>
</tr>
<tr>
<td>2</td>
<td>Alarm Line</td>
</tr>
<tr>
<td>3</td>
<td>System Alarm Band</td>
</tr>
</tbody>
</table>

**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.

<table>
<thead>
<tr>
<th>RTN</th>
<th>28 13:56:34:462</th>
<th>AM2</th>
<th>Inoperative</th>
<th>Service Provider in Operational State</th>
<th>0</th>
</tr>
</thead>
<tbody>
<tr>
<td>RTN</td>
<td>28 13:56:34:462</td>
<td>Alarm Manager_Basic_Inoperative</td>
<td>Service Provider in Operational State</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>RTN</td>
<td>28 13:54:37:696</td>
<td>Basic</td>
<td>Inoperative</td>
<td>Service in Operation</td>
<td>0</td>
</tr>
</tbody>
</table>

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 133.

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.
Section 3  Operator Workplace

Application Bar

Figure 8. Object Shortcut Tool

<table>
<thead>
<tr>
<th>Legend</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Object Icon</td>
</tr>
<tr>
<td>2</td>
<td>Object</td>
</tr>
<tr>
<td>3</td>
<td>Data Entry</td>
</tr>
<tr>
<td>4</td>
<td>Object History</td>
</tr>
<tr>
<td>5</td>
<td>Graphic Display PG2</td>
</tr>
<tr>
<td>6</td>
<td>Faceplate PG2</td>
</tr>
<tr>
<td>7</td>
<td>Trend Display</td>
</tr>
<tr>
<td>8</td>
<td>Alarm and Event List</td>
</tr>
</tbody>
</table>

Desired aspect for selected object is selected from the **Object Context** drop-down menu or by clicking on the **Object Icon**. See Figure 9.
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.
<table>
<thead>
<tr>
<th>Legend</th>
<th>Description</th>
<th>Toolbar Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Find</td>
<td>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.</td>
</tr>
<tr>
<td>2</td>
<td>All Process Alarms</td>
<td>Shows a listing of all alarms from the process. See also Process Alarm List on page 111.</td>
</tr>
<tr>
<td>3</td>
<td>All Process Events</td>
<td>Shows a listing of all events in the process.</td>
</tr>
<tr>
<td>4</td>
<td>System Alarms</td>
<td>Shows a listing of all alarms in the control system. See System Alarms on page 133.</td>
</tr>
<tr>
<td>5</td>
<td>System Event List</td>
<td>Shows a listing of all events in the system.</td>
</tr>
<tr>
<td>6</td>
<td>System Status</td>
<td>Shows a listing of status information for system services in the Service Structure.</td>
</tr>
<tr>
<td>7</td>
<td>External Alarm Silence</td>
<td>Used to silence all external alarms.</td>
</tr>
<tr>
<td>8</td>
<td>Replacement Strategy Tool</td>
<td>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 41.</td>
</tr>
<tr>
<td>9</td>
<td>Toggle Browser</td>
<td>Switches the Toggle Browser on and off. When it is switched on, the Toggle 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 Toggle Browser is displayed in a separate window. When the button is up, the Toggle Browser is closed. For further information see Toggle Browser on page 67.</td>
</tr>
<tr>
<td>Legend</td>
<td>Description</td>
<td>Toolbar Description</td>
</tr>
<tr>
<td>--------</td>
<td>---------------------------------</td>
<td>-----------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>10</td>
<td>Aspect Menu (Favorites)</td>
<td>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 60.</td>
</tr>
<tr>
<td>11</td>
<td>Print Screen</td>
<td>Used to print the Operator Workplace contents. The screen where the tool is clicked will be printed on the default printer.</td>
</tr>
<tr>
<td>12</td>
<td>Close All Overlaps</td>
<td>Closes all overlapping windows (overlap windows) opened in the Operator Workplace.</td>
</tr>
<tr>
<td>13</td>
<td>Show Help</td>
<td>Shows the Online Help. See also Online Help on page 56.</td>
</tr>
<tr>
<td>14</td>
<td>About IndustrialIT</td>
<td>Shows information about the installed systems and extensions</td>
</tr>
<tr>
<td>15</td>
<td>Close Workplace</td>
<td>Closes the Operator Workplace</td>
</tr>
</tbody>
</table>

**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.

![Filter Drop-Down Menu](image)

**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.

![Display Bar](image)

**Figure 12. The Display Bar**

<table>
<thead>
<tr>
<th>Legend</th>
<th>Description</th>
<th>Toolbar Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Back to Previous Display</td>
<td>Shows the previous display in the aspect history list.</td>
</tr>
<tr>
<td>2</td>
<td>Forward to Next Display</td>
<td>Shows the next display in the aspect history list.</td>
</tr>
<tr>
<td>3</td>
<td>Aspect History List</td>
<td>Shows a listing of the most recently viewed aspects or type of information (the latest used display on top).</td>
</tr>
<tr>
<td>4</td>
<td>Drop Target</td>
<td>Drag an aspect to the Drop Target Tool and it will be displayed in the Display Area.</td>
</tr>
<tr>
<td>5</td>
<td>Pinned Tool</td>
<td>Pins the display like a note on a billboard. The display can not be changed by clicking the Backward or Forward button, or by dropping a display on the Drop Target tool. To enable change of display, remove the pinning of the display</td>
</tr>
<tr>
<td>6</td>
<td>View Selector</td>
<td>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 generally not relevant for operators.</td>
</tr>
</tbody>
</table>
To change the display in the Operator Workplace window, place the pointer in the main Operator Workplace window or a overlap display, where you want to change display.

Click the workplace. 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.

<table>
<thead>
<tr>
<th>Legend</th>
<th>Description</th>
<th>Toolbar Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>Aspect Icon Tool</td>
<td>Used, for example, to add the aspect as a favorite by selecting <strong>Add to Aspect Menu</strong> in the drop-down menu. You also have the possibility to display the aspect view on another workplace by selecting the workplace from the <strong>Send To</strong> submenu in the drop-down menu.</td>
</tr>
<tr>
<td>8</td>
<td>Shortcuts</td>
<td>Provides shortcuts to specific displays. Shortcuts can be added and configured to point out specific displays.</td>
</tr>
<tr>
<td>Legend</td>
<td>Description</td>
<td>Toolbar Description</td>
</tr>
<tr>
<td>--------</td>
<td>-------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>1</td>
<td>Print Aspect View</td>
<td>Prints the display area.</td>
</tr>
<tr>
<td>2</td>
<td>Target</td>
<td>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.</td>
</tr>
<tr>
<td>3</td>
<td>Zoom</td>
<td>By using the <strong>Zoom Tool</strong> the display area will be enlarged, see Figure 15. The zoom tool is used when having a panel with several display areas included.</td>
</tr>
</tbody>
</table>

*Figure 14. Target Tool*
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
## Multiple Screens

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

In System 800xA, the monitors can be configured to behave as separate screens, called Multi-Screen Workplace, or as a single screen expanding to all monitors, called Large Workplace.

In a Multi-Screen Workplace, a single workplace is opened in each screen and in a Large Workplace, a single workplace is spanned across all the screens covering the entire area of the screens.

Using multiple screens, the applications can be moved from one monitor to another, or be displayed simultaneously on more than one monitor. System 800xA provides a set of pre-configured Operator Workplaces using multiple screens.

To use multiple screens in System 800xA, a client should be equipped with additional hardware. The user must have graphic cards that support the number of monitors to be used.

The 800xA System supports up to four monitors connected to one PC. Contact ABB for information about the supported graphic cards.

<table>
<thead>
<tr>
<th>Legend</th>
<th>Description</th>
<th>Toolbar Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Operator Message Line</td>
<td>Shows the latest Operator message from the control system.</td>
</tr>
<tr>
<td>2</td>
<td>Operator Message List</td>
<td>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 89.</td>
</tr>
<tr>
<td>3</td>
<td>Current User Tool</td>
<td>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 42.</td>
</tr>
</tbody>
</table>
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.

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

The tabbed workplace is designed to:

- Organize the graphic displays to resemble the aspect object structure
- Navigate between graphic displays using the buttons, tabs and drop-down lists
- Respond quickly to alarms and events
- Drill down to the source of the alarm by using the built-in alarm indication

It is designed for users who work with multiple screens so they can call up any graphical display on the screen. It is a two or three screen workplace where the area buttons at the top as well as, aspect links in the displays detect the number of screens automatically. This built-in functionality opens a display on any of the selected screens.

The tab workplace deals with graphic displays which are showed as a base display in the workplace. It is not used for overlap windows.

Tabbed Navigation

The tabs are automatically created using the object names and are used to navigate to the corresponding graphic display. If a tab object includes child objects, these appear as a dropdown list within the tab, and the user can navigate to the required object. The Tabbed Workplace also includes Status Indicators and a Breadcrumb list for each tab. The Breadcrumb list shows the object path, starting from the parent object till the current object as shown in Figure 20.
The Status Indicators (see Figure 21) include an Alarm Indicator and a Status Indicator. The Alarm Indicator shows the alarm severity. These indicators guide the user through the object hierarchy to locate the display that contains the alarm. This saves engineering time for navigation configuration. The Status Indicator shows the alarm status information. For example, the status can be hidden or shelved. For more information on configuring the tabs refer System 800xA Operations 6.0 Operator Workplace Configuration (3BSE030322*).

Figure 20. Tabbed Workplace (Displaying tabs and Breadcrumb list)
Pre-requisites to work with tabbed workplace

The pre-requisites to work with tabbed workplace are as follows:

- An object should have at least one default aspect of Graphic Display PG2 or Graphic Display to appear as a tab.
- Only one Graphic Display per aspect object is displayed in the tab workplace.
- The alarm status is indicated by connecting the tab to an OPC value provided by an alarm list. The Functional structure and alarm lists are other ways in
which the alarm status can be accessed and its status indicated in the tabbed workplace.

**Display structure**

The order of the tabs is the same as the order of the aspect objects. The order can be changed by manually re-arranging the objects in the structure aspect. The area buttons, tabs and drop down menus are automatically populated based on the objects which are available under the configured root object. The aspect, which is the default aspect is shown in the panel, but only if the view class is correct. Picking the default aspect can be done by setting an aspect as “default”. Only aspects of “Tab Content” view class will be displayed in the Panel. By using the view class mapping aspect additional aspects other than the already mapped ones can be displayed.

The purpose of the Functional Structure is to organize objects in based on functionality and this need not be the display structure. In fact it is recommended to use a separate “Display Structure” for the tabbed workplace. Create a “Display Structure” category and insert objects as per the requirement. Then set tab workplace root to the root object of your display structure. For more information on configuring the tabbed workplace refer *System 800xA Operations 6.0 Operator Workplace Configuration (3BSE030322)*.

**Alarms and Events**

The alarm status is indicated by connecting the tab to an OPC value. This OPC value is provided by an alarm list. If the functional structure is used then it may be possible to use “Objects and descendents” this is possible when all control objects are represented as child objects in the functional structure. The user can configure the alarm list to show the alarm status for objects used in the graphic display. In such cases it is possible to use the tabbed workplace without using the functional structure. This feature helps in upgrading of the older systems.

The tab control has built- in functionality to propagate the more important alarm status to the top. This means that if the alarm is on an object that is only on a child object then the alarm status will still be visible on the top level so that the user can drill down to the interested object. It is also possible to provide this data from an external source as some customers have custom made services. For more
information refer System 800xA Operations 6.0 Operator Workplace Configuration (3BSE030322*).

Window Management

Pinning

If you click on the **Pinned Tool** in the Display Bar, see Figure 22, 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 <Shift> when opening an aspect from the context menu, favorites or the toggle browser. This makes the aspect to be presented in a new overlap window.

![Figure 22. Pinned Tool](image)

Replace/Preserve

![Figure 23. The Replace/Preserve Drop-Down Menu](image)

**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 24. 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 Windows File System is still controlled by the user logged in.
To change user right-click on the user name and select **Change User...**, see Figure 25.

![Change User dialog box](image)

**Figure 25. 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 26.

![Change User Authentication Dialog Box](image)

**Figure 26. 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 25, 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 27) 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.

Figure 27. Approval Dialog Box

For double authentication the Second Approval area is activated (see Figure 28).
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. It is also here optional to enter a comment in the Approval Comment text field.

![Double Approval Dialog Box]

Figure 28. 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 29.
3. In the Request Responsibility dialog (Figure 30), select responsibility. The Operation responsibility is selected by default.

When requesting a section, the subsections are automatically included.
Figure 30. 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 31) is displayed to the current responsible user on the responsible node, if possible with the details of the request.

![Handover Responsibility Dialog](image)

**Figure 31. 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 32) and a confirmation is sent to the new responsible user (Figure 33).

![Request Responsibility](image)

**Figure 32. Request Responsibility after the Request is Taken**
The Figure 34 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 34. 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 35.

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.
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 36**.

Responsibility of a subsection cannot be released if the user is responsible for the parent section.
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 37), only sections below the current object are displayed.
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 38. 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 click Yes, otherwise click No.

**Online Help**

If you want help meanwhile running the Operator Workplace you can click the **Show Help** button, refer to Figure 39. When the online help is displayed you also have access to all online help documentation.

*Figure 39. 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 40. 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 41.

![Operator Workplace with labels for different navigation elements]

**Figure 41. Display Switching**

<table>
<thead>
<tr>
<th>Legend</th>
<th>Description</th>
<th>Toolbar Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Application Bar</td>
<td>See Application Bar.</td>
</tr>
<tr>
<td>2</td>
<td>Display Bar</td>
<td>See Display Bar.</td>
</tr>
<tr>
<td>3</td>
<td>Back and Forward Buttons</td>
<td>To move back to the previous display or to move forward to the next display.</td>
</tr>
<tr>
<td>4</td>
<td>Aspect History List</td>
<td>To get the most recently viewed aspects (the latest displayed on top). The list contains both the object and its aspects.</td>
</tr>
<tr>
<td>5</td>
<td>Drop Target</td>
<td>To view an aspect by dragging it (from for example, the toggle browser) to the Drop Target area.</td>
</tr>
<tr>
<td>6</td>
<td>Favorites</td>
<td>To group and organize the most visited aspects for fast navigation.</td>
</tr>
</tbody>
</table>

**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 42.

Figure 42. 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 43.
Section 4 Navigation

Display Switching

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.

![Aspect Menu tool](image)

**Figure 43. 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 a few predefined Hot Keys available in the Operator Workplace.

Table 1. Workplace Hot Keys

<table>
<thead>
<tr>
<th>Hot Key Operation</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALT+HOME</td>
<td>Show Pointer</td>
</tr>
<tr>
<td>CTRL+F</td>
<td>Find tool</td>
</tr>
<tr>
<td>CTRL+SHIFT+3</td>
<td>All process alarms</td>
</tr>
<tr>
<td>CTRL+SHIFT+4</td>
<td>All process events</td>
</tr>
<tr>
<td>CTRL+SHIFT+5</td>
<td>System alarms</td>
</tr>
<tr>
<td>CTRL+SHIFT+6</td>
<td>System events</td>
</tr>
<tr>
<td>CTRL+SHIFT+7</td>
<td>System status</td>
</tr>
<tr>
<td>CTRL+SHIFT+S</td>
<td>Direct external alarm silence</td>
</tr>
<tr>
<td>CTRL+ALT+F4</td>
<td>Close all overlaps</td>
</tr>
<tr>
<td>ALT+F4</td>
<td>Close Active Window</td>
</tr>
<tr>
<td>F1</td>
<td>Context Sensitive Help</td>
</tr>
<tr>
<td>CTRL+SHIFT+F1</td>
<td>Show hot key map</td>
</tr>
</tbody>
</table>
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 **Toggle Browser** provides the possibility to search for objects and their aspects by browsing structures.
- The **Context Menu**, displayed on a right-click, always gives you direct access to aspects of an object.

![Figure 44. Navigation in Operator Workplace](image)
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 46. For more information on the submenu configuration, refer to the Submenu Configuration section in System 800xA Operations, Operator Workplace Configuration (3BSE030322*).

**Figure 46. Grouped Submenu in the Context Menu**

The different parts of the object context menu are as follows, see Figure 46:

- 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.
By clicking the **Toggle Browser** button ☰, you switch the Toggle Browser on and off. When switched on, the Toggle 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 double-click the selected aspect in the aspect list area, see Figure 48.

**Figure 48. The Toggle Browser**
Section 5  Process Graphics

Overview

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 conveyor 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 49. 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 60) when the object is locked by a user, refer to Header on page 83 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 64 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 79. 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 49. 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 does not contain Graphic Elements, only the alarms of 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 50.

![Figure 50. Display bar of a graphic aspect](image-url)
2. Right-click the preview area of the graphic aspect and select **Acknowledge All Visible Alarms** from the context menu as shown in **Figure 51**.

*Figure 51. 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 52.

![Figure 52. Example of a Display Element for a Motor](image)

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 appear in Graphics elements and faceplates. For more symbols, see Appendix C, Icons and Symbols.

Table 2. Symbols in Graphics elements

<table>
<thead>
<tr>
<th>Appearance</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1" alt="Operator Note Icon" /></td>
<td>There are Operator Notes for the object. See Operator Note on page 89.</td>
</tr>
<tr>
<td><img src="image2" alt="Automatic Run Icon" /></td>
<td>Object is run automatically by the system.</td>
</tr>
<tr>
<td><img src="image3" alt="Manual Control Icon" /></td>
<td>Object is controlled manually.</td>
</tr>
<tr>
<td><img src="image4" alt="Interlock Icon" /></td>
<td>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.</td>
</tr>
<tr>
<td><img src="image5" alt="Off Icon" /></td>
<td>Off The object is turned off.</td>
</tr>
</tbody>
</table>
**Table 2. Symbols in Graphics elements (Continued)**

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

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1" alt="Symbol" /></td>
<td>Status is uncertain. Values and information from the controller can not be trusted. Contact your system support.</td>
<td><img src="image2" alt="Example" /></td>
</tr>
<tr>
<td><img src="image3" alt="Symbol" /></td>
<td>Status is bad. No contact with the controller. Contact your system support.</td>
<td><img src="image4" alt="Example" /></td>
</tr>
</tbody>
</table>
Group Display

A Group Display is a convenient way to view several faceplates for different process objects at the same time, see Figure 53.

Figure 53. 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 54.

Figure 54. 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 C, Icons and Symbols.

The faceplates can be opened in the following ways, refer to Figure 55:

- 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 55. 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 56. Reduced Faceplate and Faceplate View and Extended Faceplate](image)

**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 57](#).
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 44 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 62 for more information.
Figure 58. 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:

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

Figure 59. Example of a Header Area
object is locked, see Figure 60.

![Figure 60. Example of a Locked Graphical Element](image)

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.*

<table>
<thead>
<tr>
<th>Lock status</th>
<th>Button</th>
<th>Icon</th>
<th>Background Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unlocked</td>
<td>Raised</td>
<td><img src="image" alt="icon" /></td>
<td>Bluegrey</td>
</tr>
</tbody>
</table>
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 136. Refer to Table 17 for a list of alarm indications.

<table>
<thead>
<tr>
<th>Lock status</th>
<th>Button</th>
<th>Icon</th>
<th>Background Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>Locked by me</td>
<td>Sunken</td>
<td><img src="image" alt="Icon" /></td>
<td>White</td>
</tr>
<tr>
<td>Locked by [name of the user who locked]</td>
<td>Flat</td>
<td><img src="image" alt="Icon" /></td>
<td>Yellow</td>
</tr>
</tbody>
</table>

*Table 4. Lock States Displayed in the Object Lock.*
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 61. Example of Status and Navigation Bar Area](image)

Element Area

The faceplate element area in Figure 62 contains two tab groups with the displayed faceplate elements Interlock and TrimCurve.

![Figure 62. Example of a Faceplate Element Area](image)
The faceplate element area can also contain graphic information as shown in Figure 63.

![Faceplate Element with Bargraph](image)

**Figure 63. 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 `<Esc>` 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 18 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 an action is applied, the button appears to be pressed down and the **Apply** button is activated (for example, see **On** button in Figure 64). Click the **Apply** button or press <Enter> for the operation to take effect.

![Figure 64. Applied Action Button](image)

**View Selection Buttons**

These buttons, see Figure 65, 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 65. View Selection Buttons](image)
<table>
<thead>
<tr>
<th>Legend</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Reduced Faceplate</td>
</tr>
<tr>
<td>2</td>
<td>Faceplate</td>
</tr>
<tr>
<td>3</td>
<td>Extended Faceplate</td>
</tr>
<tr>
<td>4</td>
<td>Pinning</td>
</tr>
</tbody>
</table>

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 66. An example of an Operator Note*
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, Alarm Shelving, and Alarm Grouping) features are license protected. The description added for these features in this section, are not applicable for all the users.

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).
Section 6 Alarms and Events

Alarm Analysis

- 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 67 displays a graphical representation of the 20 longest standing alarms for the latest time period.
Figure 67. Longest Standing Alarms Report

The longest standing alarms KPI measures the time between activation and deactivation of alarms.
Figure 68 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 68. Most Frequent Alarms Report
Figure 69 displays a graphical representation of the alarm priority distribution.

Figure 69. Alarm Priority Distribution Report
Figure 70 displays the average alarm rate and the peak alarm rate in one display.

![Figure 70. Peak and Average Alarm Rate Report](image-url)
Figure 71 displays the alarms per short term interval and the acceptability level of the alarm rate.

![Figure 71. Alarm Rate Report](image-url)
Figure 72 displays the number of standing alarms for a given reporting period.

Figure 72. Number of Standing Alarms
Figure 73 displays the average time to acknowledge the alarms.

![Figure 73. Average Time to Acknowledge Alarms](image)

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

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 \[ \text{\textbullet} \] in the GroupAlarm column of the Alarm List. See Figure 74.

![Figure 74. Group Alarm Indication](image)

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.

![Group Alarm Icon and Show Group](image)

**Figure 75. Group Alarm Icon and Show Group**

All the alarms included in the Alarm Group are displayed in an overlap window (see **Figure 76**).
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.
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 78).

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 78. Alarm and Event Context Menu](image-url)
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 79).

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

*Figure 79. Object Context Menu*
AC 800M Status Monitoring

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 80** shows the **Hardware Status and Tag Navigation** aspect for a Hardware Object.

*Figure 80. Hardware Status and Tag Navigation aspect - For a Hardware Object*
Section 6  Alarms and Events

Viewing the Diagnostic Information

- **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 81 shows the Hardware Status and Tag Navigation for an I/O Object.

![Hardware Status and Tag Navigation aspect - For an I/O Object](image)

Figure 81. 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*

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

  – **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 82.
- 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 82. For more about Alarm Band see Alarm Band on page 129.
- From an Alarm Line in the Application Bar using the context menu (see Figure 82).

Figure 82. Accessing the Process Alarm List
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.

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
Section 6 Alarms and Events

Process Alarm List

- 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.

- **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 84.

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.
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 85. 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 86**.

![Figure 86. Shelve Selected Context Menu](image)

A Shelving Authentication dialog is displayed if operator authentication is required for shelving the alarms.
2. In the Shelve Alarm(s) dialog (Figure 87):

Figure 87. 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 88. Process Alarm List Tool Bar

- **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** - To acknowledge alarms. See **Acknowledge** on page 114.

- **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.

- **Alarm Response Navigation** - For more information, refer to **Alarm Response Navigation** on page 105.

- **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.

- **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.

• **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 128.

• **Print Preview** - See Print on page 128.

• **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*

<table>
<thead>
<tr>
<th>Operation</th>
<th>Hot Key</th>
</tr>
</thead>
<tbody>
<tr>
<td>Copy to clipboard</td>
<td>CTRL+C</td>
</tr>
<tr>
<td>Select all Alarms/Events</td>
<td>CTRL+A</td>
</tr>
<tr>
<td>Stop Update</td>
<td>CTRL+SHIFT+ALT+U</td>
</tr>
<tr>
<td>Remove Selected</td>
<td>CTRL+R</td>
</tr>
<tr>
<td>Remove Page</td>
<td>CTRL+SHIFT+ALT+R</td>
</tr>
<tr>
<td>Remove Whole List</td>
<td>CTRL+SHIFT+ALT+W</td>
</tr>
<tr>
<td>Acknowledge Selected</td>
<td>CTRL+SHIFT+A</td>
</tr>
<tr>
<td>Acknowledge Page</td>
<td>CTRL+SHIFT+ALT+A</td>
</tr>
<tr>
<td>Acknowledge Object</td>
<td>CTRL+SHIFT+R</td>
</tr>
<tr>
<td></td>
<td>CTRL+SHIFT+Q</td>
</tr>
<tr>
<td>Acknowledge Whole List</td>
<td>CTRL+ALT+W</td>
</tr>
<tr>
<td>Reload Configuration</td>
<td>CTRL+SHIFT+Home</td>
</tr>
</tbody>
</table>
Table 6. Hot Keys (Continued)

<table>
<thead>
<tr>
<th>Operation</th>
<th>Hot Key</th>
</tr>
</thead>
<tbody>
<tr>
<td>Show Details</td>
<td>CTRL+SHIFT+D</td>
</tr>
<tr>
<td>Page Up</td>
<td>CTRL+SHIFT+PageUp</td>
</tr>
<tr>
<td>Page Down</td>
<td>CTRL+SHIFT+PageDown</td>
</tr>
<tr>
<td>View Hiding Configuration</td>
<td>CTRL+SHIFT+ALT+M</td>
</tr>
<tr>
<td>Print List</td>
<td>CTRL+ALT+P</td>
</tr>
<tr>
<td>Print Preview</td>
<td>CTRL+SHIFT+ALT+P</td>
</tr>
</tbody>
</table>

Marking and Selecting Rows.

The different methods of selecting rows are:

- Click on a row to select it. The selected row becomes highlighted.
- Press <Ctrl> and click on another row to select nonsequential rows.
- Press <Shift> key to select a sequential group of rows. For example, select row 2, hold <Shift> 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 89.

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 89.
In a similar manner, two adjacent columns can be selected and moved. This change is only in effect while this view is active.

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 90 is displayed.
3. The example below is the ObjectName column:

---

**Figure 89. Moving a Column in a Process Alarm List**
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).

![Runtime Attribute Filter](image)

*Figure 90. 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**

<table>
<thead>
<tr>
<th>Character</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>.</td>
<td>Matches any single character. Same as “?” in a simple query.</td>
</tr>
<tr>
<td>[ ]</td>
<td>A character class that will match all character inside the brackets. [AB] will match all strings containing the character A or B.</td>
</tr>
<tr>
<td>^</td>
<td>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 &quot;a&quot;, &quot;b&quot;, and &quot;c&quot;). 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 &quot;a&quot;, &quot;b&quot;, or &quot;c&quot;).</td>
</tr>
<tr>
<td>-</td>
<td>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.</td>
</tr>
<tr>
<td>?</td>
<td>Indicates that the preceding expression is optional, i.e [0-9][0-9]? matches both one and two digits.</td>
</tr>
<tr>
<td>+</td>
<td>Indicates that the preceding expression matches one or more times, for example [2]+ matches 2, 22, 222 and so on.</td>
</tr>
<tr>
<td>*</td>
<td>Indicates that the preceding expression matches zero or more times.</td>
</tr>
<tr>
<td>??, +?, *?</td>
<td>Tries to match as little as possible. Example the expression &lt;.<em>?&gt; on the string “&lt;abc&gt;&lt;def&gt;” will match &lt;abc&gt; while the expression &lt;.</em>&gt; will match the whole string “&lt;abc&gt;&lt;def&gt;”.</td>
</tr>
<tr>
<td>( )</td>
<td>Grouping operator. For example ([0-9]<em>)* will match 0 a string of digits separated with underscores, like 0</em>, 0_1, or 0_1_1.</td>
</tr>
<tr>
<td>\</td>
<td>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.</td>
</tr>
<tr>
<td>!</td>
<td>Separates two expressions, for example AllO in a character class matches both Al and AO</td>
</tr>
<tr>
<td>!</td>
<td>Negation operator. A!B matches a string starting with A and not followed by a B.</td>
</tr>
</tbody>
</table>
There are some abbreviations that could simplify an expression if used. The following exist:

**Table 8. Abbreviations**

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Matches</th>
</tr>
</thead>
<tbody>
<tr>
<td>\a</td>
<td>Any alphanumeric character: [a-zA-Z0-9]</td>
</tr>
<tr>
<td>\b</td>
<td>White space (blank): ([ \t])</td>
</tr>
<tr>
<td>\c</td>
<td>Any alphabetic character: [a-zA-Z]</td>
</tr>
<tr>
<td>\d</td>
<td>Any decimal character: [0-9]</td>
</tr>
<tr>
<td>\h</td>
<td>Any hexadecimal digit: ([0-0a-fA-F])</td>
</tr>
<tr>
<td>\n</td>
<td>Newline: (\r(\r?\n))</td>
</tr>
<tr>
<td>\q</td>
<td>A quoted string: (&quot;[^&quot;]*&quot;)</td>
</tr>
<tr>
<td>\w</td>
<td>A simple word: ([a-zA-Z]+)</td>
</tr>
<tr>
<td>\z</td>
<td>An integer: [0-9]+</td>
</tr>
</tbody>
</table>

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 91.

![Message Comment Dialog Box](image)

**Figure 91. 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 represents the highest priority alarm present.

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 92), 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 93 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 93. Hidden Alarms](image)

**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 94 for more information.
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 95. 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 96**. It is also possible to access it via a Hot Key, if this is configured for your Operator Workplace.

*Figure 96. Alarm Logger Manager in the Application Bar*
All available printers will be shown in the Alarm Logger Manager dialog. See Figure 97.

![Alarm Logger Manager](image)

**Figure 97. 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 82).
- from an Alarm Band button in the Application Bar (see Figure 98).

Figure 98. Accessing the System Alarm List

Figure 99. 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 114.

Silence Audible Alarm and External Alarm

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 119.

Print
See Print on page 128.

Moving System Alarm Data to other Applications
See Moving Process Alarm Data to other Applications on page 129

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).

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 if 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.

• **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.
• **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 101.
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 101. 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:

<table>
<thead>
<tr>
<th>Legend</th>
<th>Description</th>
<th>Toolbar Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Start/Stop</td>
<td>To start, restart or stop list updates.</td>
</tr>
<tr>
<td>2</td>
<td>Details</td>
<td>To see extended information of the selected event.</td>
</tr>
<tr>
<td>3</td>
<td>Select Attribute Filter Set</td>
<td>To remove the current filter. Click the drop-down to select a predefined attribute filter. If a filter is selected, this will be indicated between the toolbar and the event list.</td>
</tr>
<tr>
<td>4</td>
<td>Page Up</td>
<td>To show the previous 500 events in the list.</td>
</tr>
<tr>
<td>5</td>
<td>Page Down</td>
<td>To show the next 500 events in the list.</td>
</tr>
</tbody>
</table>
### 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](#).

---

<table>
<thead>
<tr>
<th>Legend</th>
<th>Description</th>
<th>Toolbar Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>Connected To All Servers</td>
<td>To view the System Status Viewer. For more information, refer to <em>System 800xA, Administration and Security (3BSE037410</em>)*.</td>
</tr>
<tr>
<td>7</td>
<td>Reset Runtime Configuration Changes</td>
<td>To restore the initial view if you have made changes to the event list, for example moved columns.</td>
</tr>
<tr>
<td>8</td>
<td>View Hiding Configuration</td>
<td>To view the Hiding Mask Manager. See <em>System 800xA, Operations, Operator Workplace Configuration (3BSE030322</em>)* for more information.</td>
</tr>
<tr>
<td>9</td>
<td>Print List</td>
<td>See <a href="#">Print</a> on page 128</td>
</tr>
<tr>
<td>10</td>
<td>Print Preview</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Help</td>
<td>To open the online help.</td>
</tr>
</tbody>
</table>
Moving Process Event Data to other Applications.
See Moving Process Alarm Data to other Applications on page 129.

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).

Column.
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 140.

**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 129.
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 104).
- The same as above but with the Trend Table on top, this is the Top View (Figure 105).
- 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 106).
- The same as above also exist with the Item Area to the right, this is the Right View (Figure 107).

The first two layouts are divided into three areas: the Trend Area, the Trend Tool Bar and the Trend Table, see Figure 104.

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 106.
Figure 104. Trend Display Main View

<table>
<thead>
<tr>
<th>Legend</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Trend Area</td>
</tr>
<tr>
<td>2</td>
<td>Trend Tool Bar</td>
</tr>
<tr>
<td>3</td>
<td>Trend Table</td>
</tr>
</tbody>
</table>
Figure 105. Trend Display Top View
Figure 106. Trend Display Left View
Trend Area

The Trend Area displays trend data as traces. See Figure 108.

Figure 107. Trend Display Right View

Figure 108. 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 151 and Trend Table on page 161.

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 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 109. Trace Identification](image)

**Trend Tool Bar**

The Trend Tool Bar contains buttons for frequently used functions to operate the Trend Display. See Figure 110.

The Trend Tool Bar lets you, among other things:

- freeze the graphical view in time.
- select a point on the graphical view, and then read the corresponding times and values for each trace.
- pan the Trend Area left and right.
zoom in to see greater detail, and zoom out to see a wider time scope.

Figure 110. Trend Tool Bar

<table>
<thead>
<tr>
<th>Legend</th>
<th>Description</th>
<th>Toolbar Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Save Configuration</td>
<td>To save the configuration.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>This is enabled when changes are done to the trend configuration.</td>
</tr>
<tr>
<td>2</td>
<td>Cancel Changes</td>
<td>Cancels all unsaved changes in the Trend Display view. Note that not all changes can be cancelled.</td>
</tr>
<tr>
<td>3</td>
<td>Reset to Template</td>
<td>Resets all applicable data in the Trend Display configuration to the default read from the template configuration, that is, any change to the Trend Template is applied to the Trend Display on clicking Reset. Note that you can lose earlier saved changes.</td>
</tr>
<tr>
<td>4</td>
<td>Show/Hide Table</td>
<td>Shows or hides the Trend Table.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Click to view the table.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>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.</td>
</tr>
</tbody>
</table>

Legend: 1 - Save Configuration 2 - Cancel Changes 3 - Reset to Template 4 - Show/Hide Table
<table>
<thead>
<tr>
<th>Legend</th>
<th>Description</th>
<th>Toolbar Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>Block/Unblock</td>
<td>Toggles the updating of the graphical view. The graphical view update is stopped if this is pressed. Click again to unblock the view. 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.</td>
</tr>
<tr>
<td>6</td>
<td>Print Trend</td>
<td>Prints the trend display and the contents of the Trend Table. It maximizes the window before taking the screenshot and scaling the Trend Table so that all information fits on one page.</td>
</tr>
<tr>
<td>7</td>
<td>Ruler</td>
<td>See <a href="#">Rulers</a> on page 171.</td>
</tr>
<tr>
<td>8</td>
<td>Move Ruler</td>
<td>See <a href="#">Rulers</a> on page 171.</td>
</tr>
<tr>
<td>9</td>
<td>Move Scope</td>
<td>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 click the vertical ruler and move it outside the grid.</td>
</tr>
<tr>
<td>10</td>
<td>Zoom In/Out</td>
<td>To 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.</td>
</tr>
<tr>
<td>Legend</td>
<td>Description</td>
<td>Toolbar Description</td>
</tr>
<tr>
<td>--------</td>
<td>-----------------</td>
<td>-----------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>11</td>
<td>Magnifying Glass</td>
<td>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 to move the pointer. 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.</td>
</tr>
<tr>
<td>12</td>
<td>XY Plot</td>
<td>See XY Plot on page 177.</td>
</tr>
<tr>
<td>13</td>
<td>Help</td>
<td>To open the online help.</td>
</tr>
<tr>
<td>14</td>
<td>Refresh</td>
<td>To refresh and plot the data for the time span in the Trend.</td>
</tr>
</tbody>
</table>
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

<table>
<thead>
<tr>
<th>Button</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Zoom in</td>
</tr>
<tr>
<td>O</td>
<td>Zoom out</td>
</tr>
<tr>
<td>A</td>
<td>Toggle between area zoom and vertical ruler.</td>
</tr>
</tbody>
</table>
Table 9. Keyboard functions in Trend Display (Continued)

<table>
<thead>
<tr>
<th>Button</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>P</td>
<td>Toggle between normal and X/Y plot mode</td>
</tr>
<tr>
<td>G</td>
<td>Toggle between normal and looking glass mode</td>
</tr>
<tr>
<td>Q</td>
<td>Removes the ruler</td>
</tr>
<tr>
<td>N</td>
<td>Sets auto scroll on</td>
</tr>
<tr>
<td>R</td>
<td>Resets Y zoom</td>
</tr>
<tr>
<td>L</td>
<td>Clears trim curves and redraws trend</td>
</tr>
<tr>
<td>Z</td>
<td>Toggle between ruler and zoom mode</td>
</tr>
<tr>
<td>X</td>
<td>Toggles mode between vertical ruler and horizontal ruler, or between vertical zoom and horizontal zoom</td>
</tr>
<tr>
<td>C</td>
<td>Removes the ruler</td>
</tr>
<tr>
<td>Q</td>
<td>Removes the ruler</td>
</tr>
<tr>
<td>Shift-Ctrl-C</td>
<td>Puts data on clipboard with full time resolution</td>
</tr>
<tr>
<td>B</td>
<td>Toggle between Y buffer and order draw</td>
</tr>
<tr>
<td>H</td>
<td>Displays Trend Keyboard Help</td>
</tr>
<tr>
<td>M-B</td>
<td>Toggle between bad data mode Nothing and Dashed</td>
</tr>
<tr>
<td>M-D</td>
<td>Toggle between draw mod, Linear, Stepped, Filled and Point</td>
</tr>
<tr>
<td>M-I</td>
<td>Toggle between item draw mode</td>
</tr>
<tr>
<td>Ctrl-C</td>
<td>Puts data on clipboard</td>
</tr>
<tr>
<td>&lt;Delete&gt;</td>
<td>Removes the ruler</td>
</tr>
<tr>
<td>&lt;Back&gt;</td>
<td>Removes the ruler</td>
</tr>
<tr>
<td>&lt;Escape&gt;</td>
<td>Removes the ruler</td>
</tr>
<tr>
<td>Shift&lt;Left&gt;</td>
<td>Scrolls left</td>
</tr>
<tr>
<td>&lt;Left&gt;</td>
<td>Moves ruler left</td>
</tr>
</tbody>
</table>
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.

### Table 9. Keyboard functions in Trend Display (Continued)

<table>
<thead>
<tr>
<th>Button</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shift&lt;Right&gt;</td>
<td>Scrolls right</td>
</tr>
<tr>
<td>&lt;Right&gt;</td>
<td>Moves ruler right</td>
</tr>
<tr>
<td>&lt;Up&gt;</td>
<td>Moves horizontal ruler up</td>
</tr>
<tr>
<td>&lt;Down&gt;</td>
<td>Moves horizontal ruler down</td>
</tr>
<tr>
<td>&lt;Space&gt;</td>
<td>Executes operation performed using the keyboard</td>
</tr>
<tr>
<td>&lt;Enter&gt;</td>
<td>Executes operation performed using the keyboard</td>
</tr>
</tbody>
</table>

**Figure 111. Top Tool Bar**
<table>
<thead>
<tr>
<th>Legend</th>
<th>Description</th>
<th>Toolbar Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Save Configuration</td>
<td>To save the configuration. This is enabled when changes are done to the trend configuration.</td>
</tr>
<tr>
<td>2</td>
<td>Cancel Changes</td>
<td>Cancels all unsaved changes in the Trend Display view. Note that not all changes can be cancelled.</td>
</tr>
<tr>
<td>3</td>
<td>Reset to Template</td>
<td>Resets all applicable data in the Trend Display configuration to the default read from the template configuration, that is, any change to the Trend Template is applied to the Trend Display on clicking Reset. Note that you can lose earlier saved changes.</td>
</tr>
<tr>
<td>4</td>
<td>Help</td>
<td>To open the online help.</td>
</tr>
<tr>
<td>5</td>
<td>Refresh</td>
<td>To refresh and plot the data for the time span in the Trend.</td>
</tr>
<tr>
<td>6</td>
<td>Reset zoom and time scope</td>
<td>To return to the original zoom and time scope.</td>
</tr>
<tr>
<td>7</td>
<td>Set new time scope</td>
<td>Opens a Time Scope selection dialog box where you enter the length of the time scope that you want to view. Note that this time scope cannot be saved.</td>
</tr>
<tr>
<td>8</td>
<td>Configured time scopes</td>
<td>Displays the configured time scopes.</td>
</tr>
</tbody>
</table>
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.

**Legend**

<table>
<thead>
<tr>
<th>Legend</th>
<th>Description</th>
<th>Toolbar Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>Create new time scope</td>
<td>Opens a <strong>Time Scope selection</strong> dialog box where you enter the length of the time scope that you want to view. This time scope is then added to the selectable time scopes. Note that there cannot be more than six selectable timescopes.</td>
</tr>
</tbody>
</table>
| 10     | Select Aggregate     | Used to select the aggregate to be uses when drawing the 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 remove the selection of an aggregate, click the button one more time.

**Bottom Tool Bar**

*Figure 112. Top Tool Bar*
<table>
<thead>
<tr>
<th>Legend</th>
<th>Description</th>
<th>Toolbar Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Scroll back 50%</td>
<td>Moves the scope back by 50% of the current time scope. The panning blocks the trend updating. Another way to move the scope is to click the vertical ruler and move it outside the grid.</td>
</tr>
<tr>
<td>2</td>
<td>Scroll back 25%</td>
<td>Moves the scope back by 25% of the current time scope. The panning blocks the trend updating. Another way to move the scope is to click the vertical ruler and move it outside the grid.</td>
</tr>
<tr>
<td>3</td>
<td>Set end time</td>
<td>Shows the current end time in the trend display. Note that if a Vertical Ruler is active the ruler time is shown instead. If a Horizontal ruler is active, the time of click at the latest trend area is shown. Click to open the <strong>End Time selection</strong> dialog box that allows you to select a new end time. Selecting a new end time blocks the trend updating.</td>
</tr>
<tr>
<td>4</td>
<td>Scroll forward 25%</td>
<td>Moves the scope forward by 25% of the current time scope. The panning blocks the trend updating. Another way to move the scope is to click the vertical ruler and move it outside the grid.</td>
</tr>
<tr>
<td>5</td>
<td>Scroll forward 50%</td>
<td>Moves the scope forward by 50% of the current time scope. The panning blocks the trend updating. Another way to move the scope is to click the vertical ruler and move it outside the grid.</td>
</tr>
</tbody>
</table>
Item Area

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

![Diagram of Item Area]

Figure 113. Item Area

<table>
<thead>
<tr>
<th>Legend</th>
<th>Description</th>
<th>Toolbar Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Toggle and fill mode</td>
<td>Toggles the fill mode between on and off.</td>
</tr>
<tr>
<td>2</td>
<td>Show/hide trace</td>
<td>Toggles the visibility of the trace between on and off.</td>
</tr>
<tr>
<td>3</td>
<td>Object and property name</td>
<td>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.</td>
</tr>
<tr>
<td>4</td>
<td>Current or ruler value</td>
<td>Shows the current value. If a vertical or horizontal ruler is active, the ruler value is shown instead.</td>
</tr>
<tr>
<td>5</td>
<td>Object Description</td>
<td>Shows the object description if available.</td>
</tr>
<tr>
<td>6</td>
<td>Range Min and Max</td>
<td>Shows the Range Min and Range Max values.</td>
</tr>
</tbody>
</table>

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, modification is not possible without selecting the Trend Display aspect by a right-click, and then selecting Override from the context 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.

### Figure 114. Trend Table

#### Columns

- **Row Number**

  The Row Number is the index number for a specific trace in the Trend Display. Click the cell to highlight 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 169 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.

  During a drag and drop of an object to a row in a trend table, the property tagged as **Primary** (in the **Control Connection** aspect) on the dragged object is selected.

  If no property is tagged as **Primary** on the dragged object, but there are logged properties on the object, the first property configured for logging is selected.

- **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 115. Example of Selection of SEAMLESS Data](image)

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 178.

- **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 116 both traces have linear style.

  Below are examples of how Stepped (see Figure 116), Point (see Figure 117) and Filled (see Figure 118) presentations look like.

  ![Figure 116. Trace Style Stepped](#)
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 a row in the Trend Table (on the Main and Top Views), see **Figure 119**.

The second is shown when you right-click an item in the Item Area (on the Left and Right Views), see **Figure 120**.

The third is shown when you right-click the Trend Area, see **Figure 121**.
Trend Table Context Menu

![Trend Table Context Menu](image)

Figure 119. *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.
Item Area Context Menu

- **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**

<table>
<thead>
<tr>
<th>Axis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area</td>
</tr>
<tr>
<td>Axis Type</td>
</tr>
<tr>
<td>Configure</td>
</tr>
<tr>
<td>Clear</td>
</tr>
</tbody>
</table>

*Figure 120. 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 121. 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 110). 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 110) 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 122) 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. To select the ruler, click 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 122. Vertical Ruler](image)

To use this ruler in the Left and Right Views:

1. To place a Vertical Ruler in the Trend Area, click the Trend Area where you want the ruler to be placed.

2. There are two ways to move the ruler.
   - Click and then drag it left or right, or you can use the left/right arrow keys on the keyboard.
   - 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 123**) 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. To select the ruler, click and then drag left or right.

![30 Minutes](image)

**Figure 123. Vertical Size Ruler**

To use this ruler in the Left and Right Views:

1. Click the Trend Area to place a Vertical Ruler there.
2. Press <Z> to change it to a Vertical Size Ruler.
3. To select the ruler, click and then drag left or right.

Note that you also can use the left/right arrow keys to move the ruler, and then press <Enter> to complete the zoom operation.

**Horizontal Ruler**

The horizontal ruler (see Figure 124) 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. To select the ruler, click 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.

![Horizontal Ruler](image)

*Figure 124. Horizontal Ruler*

To use this ruler in the Left and Right Views:

1. To place a Horizontal Ruler in the Trend Area, click the Trend Area and then press `<X>`.

2. There are two ways to move the ruler.

   You can select it by clicking and then dragging 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 125) 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. To select the ruler, click and then drag up or down.

To use this ruler in the Left and Right Views:

1. Click the Trend Area to place a Vertical Ruler there.
2. Press <X> to change to a horizontal ruler.
3. Press <Z> to change it to a Horizontal Size Ruler.
4. To select the ruler, click and then drag up or down.

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

Figure 125. Horizontal Size Ruler
Area Size Ruler

The area size ruler (see Figure 126) 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. To select the ruler, click and then drag from upper-left down to a lower-right point.

![Figure 126. Area Size Ruler](image)

To use this ruler in the Left and Right Views:

1. Click the Trend Area to place a Vertical Ruler there.
2. Press <A> to change to an area size ruler.
3. Click where you want one of the corners for the new area, then drag and drop to the opposite corner (diagonally).

Note that you also can use the up/down and left/right arrow keys to select the area, and then press <Enter> 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 127):

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 127. 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.
**How to Create an Operator Trend Display**

To create an Operator Trend Display follow the steps below:

1. Click on the **Toggle 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 129.

![Figure 129. Create New Aspect](image)

3. Select Operator Trend in the list, see Figure 130, and give the new aspect a name.
4. Double-click on the new aspect in the aspect list to bring up the newly created Operator Trend Display, see Figure 131 and Figure 132.
Adding a Trace

To add a trace:

1. Click the Object Name cell on an empty row in the Trend Table.
2. Enter the name of an existing object or click the Browse button (see Figure 133). This displays a dialog to browse to the required object.

<table>
<thead>
<tr>
<th>Visible</th>
<th>Status</th>
<th>Object Name</th>
<th>Property</th>
<th>Log Name</th>
<th>Current Value</th>
<th>Low Range</th>
<th>High Range</th>
<th>Ruler Time</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Figure 133. 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 133.

   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**

To change a trace:

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**

To remove a trace:

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

**Changing the Area or Axis**

Right-click the cell in the Trend Table for the trace you want to change area or axis for. Do changes in the context menu, see Figure 134.

![Figure 134. Change Area or Axis](image)

**Exporting 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. Open the third party software application for example, Microsoft Excel.
2. Use zooming and move the scope to display the desired interval in the Trend Area.

3. Click the trace area of the Trend Area.

4. 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>.

   If Bulk Data Manager is installed on the System 800xA node, ensure that Microsoft Excel is open before copying the data from the Trends Area.

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 135.

![Microsoft Excel - Book1](image)

**Figure 135. 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

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
<th>Parameters(1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hourly Log</td>
<td>1 hour log of 60 x 1 minute values</td>
<td>• Tag01 - Tag20 - List of tag names&lt;br&gt;• Tag01Algorithm - Tag20Algorithm - list of algorithms to be used for interpolation. Defaults to TimeAverage.&lt;br&gt;• Start - Time of first value to be displayed. Can be any valid Excel time format, for example: 8:30:00.&lt;br&gt;• DescriptionAtom - Tag atom of the description, for example: Description&lt;br&gt;• EUAtom - Tag atom of the engineering units, for example: Unit&lt;br&gt;&lt;b&gt;Note&lt;/b&gt;: 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.</td>
</tr>
</tbody>
</table>
Table 10. Reports (Continued)

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
<th>Parameters&lt;sup&gt;(1)&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shift Log</td>
<td>8 hour log of 32 x 15 minute values</td>
<td>• Tag01 - Tag20 - List of tag names&lt;br&gt;• Tag01Algorithm - Tag20Algorithm - list of algorithms to be used for interpolation. Defaults to TimeAverage.&lt;br&gt;• Start - Time of first value to be displayed. Can be any valid Excel time format, for example: 8:30:00.&lt;br&gt;• DescriptionAtom - Tag atom of the description, for example: Description&lt;br&gt;• EUAtom - Tag atom of the engineering units, for example: Unit&lt;br&gt;&lt;span style=&quot;font-weight: bold; color: red;&quot;&gt;Note&lt;/span&gt;: 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.</td>
</tr>
<tr>
<td>Daily Log</td>
<td>1 day log of 24 x 1 hour values</td>
<td>• Tag01 - Tag20 - List of tag names&lt;br&gt;• Tag01Algorithm - Tag20Algorithm - list of algorithms to be used for interpolation. Defaults to TimeAverage.&lt;br&gt;• Start - Time of first value to be displayed. Can be any valid Excel time format, for example: 8:30:00.&lt;br&gt;• DescriptionAtom - Tag atom of the description, for example: Description&lt;br&gt;• EUAtom - Tag atom of the engineering units, for example: Unit&lt;br&gt;&lt;span style=&quot;font-weight: bold; color: red;&quot;&gt;Note&lt;/span&gt;: 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.</td>
</tr>
</tbody>
</table>
Table 10. Reports (Continued)

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
<th>Parameters&lt;sup&gt;(1)&lt;/sup&gt;</th>
</tr>
</thead>
</table>
| Monthly Log   | 31 day log of 31 x 1 day values              | • Tag01 - Tag20 - List of tag names  
• Tag01Algorithm - Tag20Algorithm - list of algorithms to be used for interpolation. Defaults to TimeAverage.  
• DescriptionAtom - Tag atom of the description, for example: Description  
• EUAtom - Tag atom of the engineering units, for example: Unit  
**Note:** 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. |
| Trip Log      | 31 values, 20 before the trip time, 10 after the trip time and 1 at the trip time. | • Tag01 - Tag20 - List of tag names  
• Tag01Algorithm - Tag20Algorithm - list of algorithms to be used for interpolation. Defaults to TimeAverage.  
• TripTime - Trip time. Can be any valid Excel time format. e.g. 8:30:00.  
• DescriptionAtom - Tag atom of the description, for example: Description  
• EUAtom - Tag atom of the engineering units, for example: Unit |
| Snapshot Historical | Single values for 20 tags at the specified time | • Tag01 - Tag20 - List of tag names  
• ReportTime - Date and time of values. Can be any valid Excel date/time format. e.g. 10/28/2003 12:00:00 PM.  
• DescriptionAtom - Tag atom of the description, for example: Description  
• EUAtom - Tag atom of the engineering units, for example: Unit |
### Table 10. Reports (Continued)

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
<th>Parameters&lt;sup&gt;(1)&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Snapshot Current</strong></td>
<td>Current values for 20 tags</td>
<td>• Tag01 - Tag20 - List of tag names</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• DescriptionAtom - Tag atom of the description, for example: Description</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• EUAtom - Tag atom of the engineering units, for example: Unit</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• ValueAtom - Tag atom of value</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• AlarmAtom - Tag atom of alarm state</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• QualityAtom - Tag atom of quality state</td>
</tr>
<tr>
<td><strong>Alarm and Event</strong></td>
<td>List of alarms and events between two times for a particular alarm and event object</td>
<td>• AreaObject – Alarm and/or Event object</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• End Time - Report end date and time, defaults to current time.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Start Time - Report start date and time, defaults to 1 day prior to the end time.</td>
</tr>
</tbody>
</table>

<sup>(1)</sup> All parameters are optional.
View an Existing Report

Use the appropriate navigation tool to view the report. See Figure 136.

Figure 136. 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 137.

Figure 137. 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 138.

Figure 138. 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 139. 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 140. 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:

![Warning Message](image)
Zooming

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

Figure 141. Structure Diagram, Context Menu
The context menu allows the following selection:

Table 11. Context Menu Functions

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

Displaying the Whole Structure for Transition

The WholeStructure property of the SFCViewerSettings aspect is used to set the default view of SFC diagram. For more information on configuring this property, refer to System 800xA, Configuration (3BDS011222*).

Enabling the Auto Scroll of SFC Structure

The AutoScroll property of the SFCViewerSettings aspect is used to set the Auto Scroll function. For more information on configuring this property, refer to System 800xA, Configuration (3BDS011222*).

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 142. 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 143. Subsequence Diagram, Default Structure Window
Figure 144. 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).
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.)
Force Backward

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.

Block All Transitions

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 147. 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 148. Disable Action for Steps Diagram](image)

**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).

![Diagram](image-url)

*Figure 149. 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 150. 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 151. 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 83.

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.

For more information on configuring a transition display, refer to System 800xA, Configuration (3BDS011222*).

The Function Plan view labels the status of the intermediate and final logic of the transition.
- T - for satisfied criteria.
- F - for unsatisfied criteria.

To disable this feature, right-click the Function Plan view display and clear the **Enable Symbol Notation** check box (see **Figure 152**).

*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 (see **Figure 153**).
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.
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.
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 153.

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

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 (clear the check box and select the *SFC Viewer Aspect* property check box 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.
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

<table>
<thead>
<tr>
<th>Identifier</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Logic</td>
<td></td>
</tr>
<tr>
<td>&amp;</td>
<td>AND</td>
</tr>
<tr>
<td>&gt;=1</td>
<td>OR</td>
</tr>
<tr>
<td>&gt;=2</td>
<td>Greater equal 2</td>
</tr>
<tr>
<td>&gt;=n</td>
<td>Greater equal 3</td>
</tr>
<tr>
<td>VAR</td>
<td>Time function</td>
</tr>
<tr>
<td>MOK</td>
<td>Mono stable</td>
</tr>
<tr>
<td>XOR</td>
<td>Ex-Or</td>
</tr>
<tr>
<td>FF</td>
<td>Flip-Flop</td>
</tr>
<tr>
<td>=</td>
<td>Equal</td>
</tr>
<tr>
<td>&gt;</td>
<td>Greater</td>
</tr>
<tr>
<td>&gt;=</td>
<td>Greater or Equal</td>
</tr>
<tr>
<td>&lt;</td>
<td>Less</td>
</tr>
<tr>
<td>&lt;=</td>
<td>Less or equal</td>
</tr>
<tr>
<td>NOT</td>
<td>Not</td>
</tr>
<tr>
<td>Mod</td>
<td>Modulus</td>
</tr>
<tr>
<td>Pow</td>
<td>Exponential (that is, raising to the power)</td>
</tr>
<tr>
<td>@name</td>
<td>Function</td>
</tr>
</tbody>
</table>

**Type**  
Criteria type:  
- Transition [T]  
- Release criteria [R0, R1])  
- Protection criteria [P0, P1],  
- End position criteria [E0, E1]

**Signal**  
Name of variable
Table 12. Transition Graphics Elements (Continued)

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

**Action Display**

Click the step button in the Structure display to open the action display.

**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 157. Action Display P1 Qualifier

```plaintext
var1 := true;
if var4 then
  intVar := 10;
end_if;
```
N Qualifier:
This action is computed during the step is active.

Figure 158. Action Display N Qualifier

P0 Qualifier:
This action is computed only for one cycle when the step goes from active to passive.
Action Display with Target Diagram Reference Name and Description

For information on configuring the action display with target diagram reference name and description, refer to *System 800xA, Configuration (3BDS011222*)*.

In the action display, the diagram reference name and its description is displayed in the **Signal** column and the operation or action is displayed in **Action** column. See Figure 160.
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*

<table>
<thead>
<tr>
<th>Function</th>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
</table>
| Operator guide mode/autoscroll | ![Symbol](image) | Push button for selecting auto refresh for this window when changing step or transition.  
The **Auto Refresh** option is not available for AC 800M objects. |
|                               | ![Symbol](image) | Push button for “freezing” the data for the selected step or transition (no operator guidance). |
| Transition view                | ![Symbol](image) | Push button to change the transition view to Function Plan view (graphical) from List view.                                                  |
|                               | ![Symbol](image) | Push button for selecting transition in list form.                                                                                       |
| Transition filtering           | ![Symbol](image) | Push button for displaying the open, unfulfilled criteria.                                                                                  |
|                               | ![Symbol](image) | 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 161.

Figure 161. Object Navigation Context Menu
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 162**.

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

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 163).
Object Navigation for Structured Data Type Variables

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.

The **SFC Uploader** aspect is used in this situation. For more information on this aspect, refer to *System 800xA, Configuration (3BDS011222*)*.

**Figure 164** 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 164. Opening List View or Function Plan View of transition that uses structured variables in control modules

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 function blocks.
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.

The SFC Uploader aspect is used in this situation. For more information on this aspect, refer to System 800xA, Configuration (3BDS011222*).

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 communication variables with structured data types in an application.
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 167). The actual tag name and its description is also displayed for Unfulfilled Criteria window (see Figure 168).

![Figure 167. Display of actual tag name and description in the transition window](image-url)
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 the user clicks OK, an empty uploader window is displayed.

Object Navigation feature is supported based on the usage of **SFC Uploader** aspect. For more information, refer *System 800xA Configuration (3BDS011222)*.
Limitations

- Limitation on 8 steps and 16 transitions that can work in parallel at the same time.
- Live data is not supported inside Action Window.
- 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.
- If there are 500 or more number of steps or transitions in an SFC Viewer, the SFC Viewer aspect may not present the SFC as required. The following warning message is displayed.

  ![SFC Viewer Warning](image)

- When a complex SFC is configured, the SFC Viewer aspect might take more than 2 seconds to display the SFC.
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 169 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.
Figure 169. Notification Methods

Table 14. Notification Methods

<table>
<thead>
<tr>
<th>Device¹</th>
<th>Notification Method</th>
<th>SMTP/E-mail</th>
<th>TAP/Modem</th>
<th>SMS/GSM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Numeric Pager</td>
<td></td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Alphanumeric Pager</td>
<td>Notify</td>
<td>Notify</td>
<td>Notify</td>
<td>Notify</td>
</tr>
<tr>
<td>2-Way Pager - Fixed Reply</td>
<td>Notify</td>
<td>Notify</td>
<td>Notify</td>
<td>Notify</td>
</tr>
<tr>
<td>2-Way Pager - User Entered Reply</td>
<td>Notify</td>
<td>Notify</td>
<td>Notify/Confirm Receipt</td>
<td></td>
</tr>
<tr>
<td>2-Way GSM Pager</td>
<td>Notify</td>
<td>Notify</td>
<td>Notify/Confirm Receipt</td>
<td></td>
</tr>
<tr>
<td>Text Messaging Enabled Telephone</td>
<td>Notify</td>
<td>Notify</td>
<td>Notify/Confirm Receipt</td>
<td></td>
</tr>
<tr>
<td>Wireless Equipped PDA</td>
<td>Notify</td>
<td>Notify</td>
<td>Notify/Confirm Receipt</td>
<td></td>
</tr>
</tbody>
</table>
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 170.
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.

Figure 170. Block Diagram
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.

**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 171* 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.
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.
Appendix A  System Alarm Messages

The System alarms generated by System 800xA functions are described in System 800xA System Alarm Messages (2PAA114623*).

The System Alarms generated by Control are available in System 800xA Control 6.0 AC 800M Configuration user manual (3BSE035980*).
## Appendix B  Priority Levels for Process Alarms and System Alarms

Table 15. Priority Levels for Process Alarms

<table>
<thead>
<tr>
<th>Process Alarms</th>
<th>Priority Level</th>
<th>Description</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Critical</td>
<td>1</td>
<td>Requires immediate operator action to not cause human health- or safety problems, plant shut-down or environment upset.</td>
<td>Risk for trip of major equipment (compressors, extruders etc.).</td>
</tr>
<tr>
<td>High</td>
<td>2</td>
<td>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.</td>
<td>Too high/low temperature, pressure, level etc. that will activate interlocks that lead to process shutdown.</td>
</tr>
</tbody>
</table>
Table 15. Priority Levels for Process Alarms (Continued)

<table>
<thead>
<tr>
<th>Process Alarms</th>
<th>Priority Level</th>
<th>Description</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medium</td>
<td>3</td>
<td>All alarms where operations have to intervene quickly to prevent process upset or quality loss.</td>
<td>These alarms are important during normal operations but may not disturb the operator during upsets where corrective action is required on critical alarms.</td>
</tr>
<tr>
<td>Low</td>
<td>4</td>
<td>All Alarms where no fast intervention is required but where the operator is requested to perform some actions as part of his normal task.</td>
<td>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.</td>
</tr>
</tbody>
</table>

Table 16. Priority Levels for System Alarms

<table>
<thead>
<tr>
<th>System Alarms</th>
<th>Priority Level</th>
<th>Description</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Critical</td>
<td>1</td>
<td>Requires immediate system maintenance action to not cause System 800xA shut down.</td>
<td>Loss of Aspect Directory, corrupt memory etc.</td>
</tr>
<tr>
<td>High</td>
<td>2</td>
<td>Requires immediate system maintenance actions to prevent parts of the System 800xA from stop functioning.</td>
<td>Loss of communication, faulty I/O module etc.</td>
</tr>
</tbody>
</table>
### Table 16. Priority Levels for System Alarms (Continued)

<table>
<thead>
<tr>
<th>System Alarms</th>
<th>Priority Level</th>
<th>Description</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medium</td>
<td>3</td>
<td>All system alarms where system maintenance has to intervene quickly to guarantee System 800xA availability, reliability and to prevent system 800xA upsets.</td>
<td>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.</td>
</tr>
<tr>
<td>Low</td>
<td>4</td>
<td>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)</td>
<td>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.</td>
</tr>
</tbody>
</table>
Appendix C  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 17 show the most common alarm indicators.

<table>
<thead>
<tr>
<th>Icon</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>![checkmark]</td>
<td>Alarm can be acknowledged.</td>
</tr>
<tr>
<td>![triangle]</td>
<td>Alarm is active and acknowledged.</td>
</tr>
<tr>
<td>![exclamation]</td>
<td>Alarm is active, but not acknowledged.</td>
</tr>
<tr>
<td>![question]</td>
<td>Indicates illegal alarm configuration.</td>
</tr>
</tbody>
</table>
Table 17. Alarm Indicators

<table>
<thead>
<tr>
<th>Icon</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Alarm is automatically disabled by the system." /></td>
<td>Alarm is automatically disabled by the system.</td>
</tr>
<tr>
<td><img src="image" alt="Alarm disabled by a user." /></td>
<td>Alarm disabled by a user.</td>
</tr>
<tr>
<td><img src="image" alt="Alarm is idle, that is there are no alarms." /></td>
<td>Alarm is idle, that is there are no alarms.</td>
</tr>
<tr>
<td><img src="image" alt="Alarm is neither active, nor acknowledged." /></td>
<td>Alarm is neither active, nor acknowledged.</td>
</tr>
<tr>
<td><img src="image" alt="Hidden Alarm." /></td>
<td>Hidden Alarm. A white rectangle covering an alarm symbol, shows that there are hidden alarms for the object.</td>
</tr>
<tr>
<td><img src="image" alt="Shelved Alarm." /></td>
<td>Shelved Alarm. A white circle appearing to the right of the alarm symbol shows that there are shelved alarms for the object.</td>
</tr>
</tbody>
</table>

**General Symbols**

Table 18 shows examples of symbols that can be found on faceplate buttons and as indicators in Graphics elements.
### Table 18. Other Symbols

<table>
<thead>
<tr>
<th>Icon</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Apply Icon" /></td>
<td>Apply</td>
</tr>
<tr>
<td><img src="image" alt="Disabled Icon" /></td>
<td>Disabled. Something in the object is disabled.</td>
</tr>
<tr>
<td><img src="image" alt="Down Icon" /></td>
<td>Down</td>
</tr>
<tr>
<td><img src="image" alt="Forward Icon" /></td>
<td>Forward</td>
</tr>
<tr>
<td><img src="image" alt="High Icon" /></td>
<td>High</td>
</tr>
<tr>
<td><img src="image" alt="Increase Icon" /></td>
<td>Increase</td>
</tr>
<tr>
<td><img src="image" alt="Internal Icon" /></td>
<td>Internal. Internal set point is used instead of an external set point.</td>
</tr>
<tr>
<td><img src="image" alt="Left Icon" /></td>
<td>Left</td>
</tr>
</tbody>
</table>
### Table 18. Other Symbols (Continued)

<table>
<thead>
<tr>
<th>Icon</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1" alt="Icon" /></td>
<td>Low</td>
</tr>
<tr>
<td><img src="image2" alt="Icon" /></td>
<td>Object is controlled manually.</td>
</tr>
<tr>
<td><img src="image3" alt="Icon" /></td>
<td>Object is set to be run automatically by the system.</td>
</tr>
</tbody>
</table>
| ![Icon](image4) | Operator Note.  
See [Operator Note](#) on page 89 for more information about Operator Note. |
| ![Icon](image5) | 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. |
| ![Icon](image6) | Pause |
| ![Icon](image7) | Reverse |
| ![Icon](image8) | Right |
### Table 18. Other Symbols (Continued)

<table>
<thead>
<tr>
<th>Icon</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Start Icon" /></td>
<td>Start</td>
</tr>
<tr>
<td><img src="image" alt="Stop Icon" /></td>
<td>Stop</td>
</tr>
<tr>
<td><img src="image" alt="Status Uncertain Icon" /></td>
<td>Status is uncertain. This symbol on top of a graphic element shows that controller communication status is uncertain.</td>
</tr>
<tr>
<td><img src="image" alt="Status Bad Icon" /></td>
<td>Status is bad. This symbol on top of a graphic element shows that controller communication status is bad.</td>
</tr>
<tr>
<td><img src="image" alt="Value Forced Icon" /></td>
<td>Value is forced by a user.</td>
</tr>
<tr>
<td><img src="image" alt="Unforce Icon" /></td>
<td>Unforce</td>
</tr>
<tr>
<td><img src="image" alt="Undo Icon" /></td>
<td>Undo</td>
</tr>
<tr>
<td><img src="image" alt="Up Icon" /></td>
<td>Up</td>
</tr>
</tbody>
</table>
Table 19 shows the graphic elements that are used for AC 800M Status Monitoring. For more information, refer to AC 800M Status Monitoring on page 108.

Table 19. Graphic Elements

<table>
<thead>
<tr>
<th>Icon</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>![Green Circle]</td>
<td>Hardware Unit status is Good.</td>
</tr>
<tr>
<td>![Exclamation Mark]</td>
<td>Hardware Unit Status is Warning.</td>
</tr>
<tr>
<td>![Red Cross]</td>
<td>Hardware Unit Status is Error.</td>
</tr>
</tbody>
</table>

Asset Condition Reporting Icons

See System 800xA, Asset Optimization, Operation (3BUA000150*) for information on AO Asset Condition Reporting.

Table 20. Asset Tree Severity Indicator Icons

<table>
<thead>
<tr>
<th>Icon</th>
<th>Severity</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>![Box]</td>
<td>None</td>
<td>None: 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.</td>
</tr>
<tr>
<td>![Check Mark]</td>
<td>Blank</td>
<td>Normal: No maintenance required.</td>
</tr>
</tbody>
</table>
### Table 20. Asset Tree Severity Indicator Icons (Continued)\(^{(1)}\)

<table>
<thead>
<tr>
<th>Icon</th>
<th>Severity</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Info" /></td>
<td>Low 1 to 100</td>
<td><strong>Maintenance</strong>: Maintenance required soon to avoid functional restrictions, e.g. caused by a nearly exhausted wear reserve or operational conditions.</td>
</tr>
<tr>
<td><img src="image" alt="Info" /></td>
<td>Low 101 to 250</td>
<td><strong>Maintenance</strong>: Maintenance required now to avoid functional restrictions, e.g. caused by a nearly exhausted wear reserve or operational conditions.</td>
</tr>
<tr>
<td><img src="image" alt="Flag" /></td>
<td>Medium: 251 to 500</td>
<td><strong>Out of specification</strong>: Asset is operating outside specified limits, caused by internal problems or process characteristics.</td>
</tr>
<tr>
<td><img src="image" alt="Exclamation" /></td>
<td>High: 501 to 750</td>
<td><strong>Function check</strong>: Asset functionality might be temporarily restricted, due to ongoing work on the asset, e.g. as local operation, maintenance, simulation, or a function check.</td>
</tr>
<tr>
<td><img src="image" alt="Cross" /></td>
<td>Critical: 751 to 1000</td>
<td><strong>Failure</strong>: Asset functionality lost due to malfunction in the asset itself or its peripherals.</td>
</tr>
</tbody>
</table>

\(^{(1)}\) Severity is defined by an increasing loss of device health and functionality.

### Table 21. Quality Indicator Overlay Icons

<table>
<thead>
<tr>
<th>Icon</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>Good quality.</td>
</tr>
</tbody>
</table>
Table 21. Quality Indicator Overlay Icons (Continued)

<table>
<thead>
<tr>
<th>Icon</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1.png" alt="Icon" /></td>
<td>Uncertain quality.</td>
</tr>
<tr>
<td><img src="image2.png" alt="Icon" /></td>
<td>Bad quality.</td>
</tr>
</tbody>
</table>
Revision History

This section provides information on the revision history of this User Manual.

The following table lists the revision history of this User Manual.

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<tr>
<th>Revision Index</th>
<th>Description</th>
<th>Date</th>
</tr>
</thead>
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<tr>
<td>-</td>
<td>First version published for 800xA 6.0</td>
<td>August 2014</td>
</tr>
<tr>
<td>A</td>
<td>Provided references to the System Alarms document in Appendix A.</td>
<td>October 2015</td>
</tr>
<tr>
<td>B</td>
<td>Published for 800xA 6.0.3, updated the content based on PRC#40698.</td>
<td>May 2016</td>
</tr>
<tr>
<td>C</td>
<td>Published for 800xA 6.0.3, cleaned FM source files for restructuring.</td>
<td>September 2016</td>
</tr>
<tr>
<td>D</td>
<td>Published for 800xA 6.0.3, Deleted Appendix reference to VB Graphics Extension.</td>
<td>September 2016</td>
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