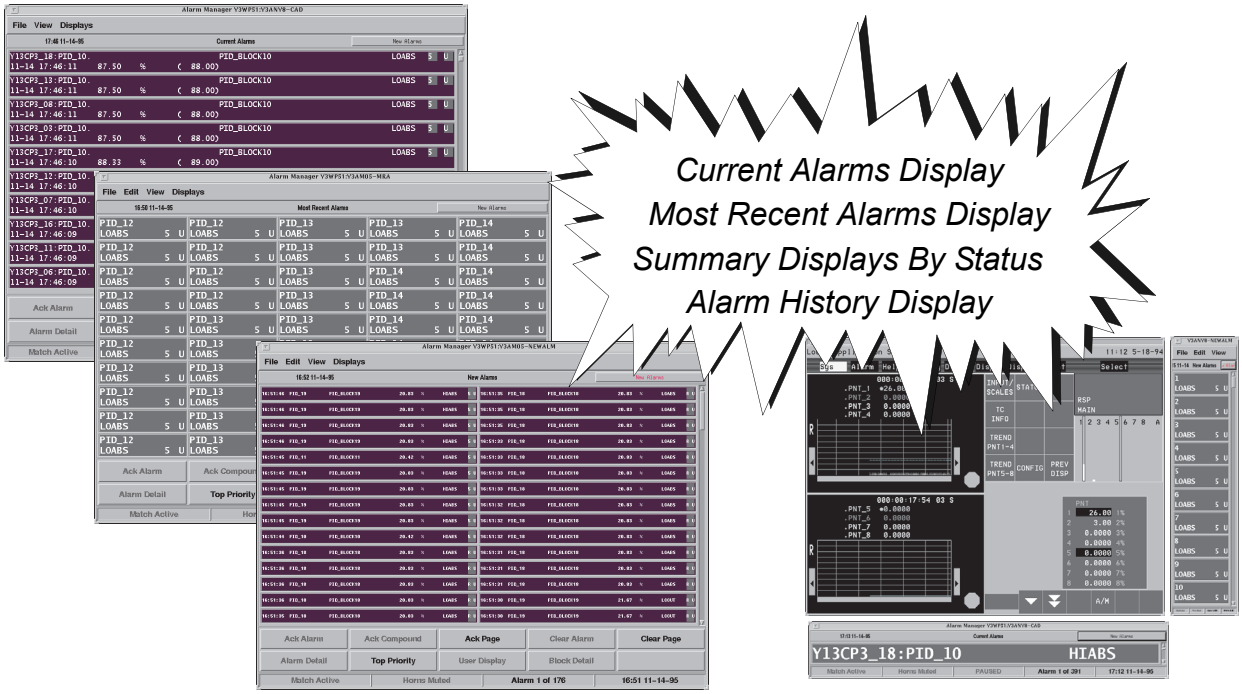
Foxboro Evo™ Process Automation System

Product Specifications

Foxboro by Schneider Electric

PSS 31S-2B2

FoxAlert™ Alarm Manager



An Extensive Collection of Configurable Alarm Displays to Meet Your Process Alarm Requirements

FoxAlert™ is an Alarm Manager providing an easy-to-use graphical interface of preconfigured alarm displays for viewing and quickly responding to process alarm conditions. The alarm display windows present alarm messages initiated by the control blocks and related to digital input state changes, absolute analog, deviation, rate of change, device status mismatch, and other alarm conditions.

OVERVIEW

Accessible from any FoxView environment, the Alarm Manager display windows provide:

- Quick, easy access to the most recent alarm messages via the Most Recent Alarm display or Current Alarms display
- Alarm status and value information dynamically updated from the control station
- Color-coded priority and status indicators that allow you to quickly focus in on critical alarms
- Summary displays for different views of the alarm database based on alarm status
- An historical list of alarms
- The capability to view subsets of alarms based on specific user-defined criteria

- The capability to silence or temporarily mute workstation and annunciator horns
- The capability to view alarms from a remote workstation
- Secured access to alarming functions dependent on user or system responsibility.

This set of resizable alarm displays, providing a variety of current and historic views of the process alarm database, include:

- A multi-page list of all the current alarms
- A single page of the most recent, active, unacknowledged alarms with dynamically updating value and status fields
- Three summary displays specific to alarm status also with updating values and statuses:
  - All active, unacknowledged alarms
  - All unacknowledged alarms that have returned to normal
  - All active, acknowledged alarms.
- A list of historized alarms related to the selected historian database
- An operations display for silencing horns, temporarily muting horns, and changing HMI environments.

These displays allow you to respond to alarm conditions, filter and analyze specific alarm data, and maintain alarm message files for reporting purposes.

FEATURES

Alarm Manager (AM) features include:

- Alarm notification from a Foxboro Evo™ or I/A Series® FoxView™ display manager environment as well as notification of new alarms within the AM window
- Simultaneous viewing of each of the seven Alarm Manager displays
- Dynamic updates (received from the control station software) to the alarm value and alarm status on select displays
- Alarm messages queued based on a default or user-configurable sorting method
- Access to additional alarm detail information not currently displayed in the alarm message
- Easy access to Block Detail or user graphic displays in a separate FoxView display manager window
- A find function to aid in performing acknowledge and clear functions on specific sets of alarms
- A match/filter function for isolating a set of alarms for problem analysis
- A sort function to dynamically re-sort alarms on a display
- A View All mode for accessing a snapshot of the entire alarm database from any summary display
- Workstation/annunciator horn management which includes:
  - Horn silencing
  - Temporary horn muting.
- Secured access to Alarm Manager features based on the HMI environments and their associated access level schemes
- File utilities to:
  - Save alarm data in file formats suitable for reporting purposes
  - Print alarm data from the display.
- The capability to configure user-defined menus and buttons and assign protection codes
- The capability to configure the alarm message presentation.

MULTIPLE ALARM MANAGERS

Multiple Alarm Managers, like multiple display managers, are optionally available to display on multiple workstations, for example, on both heads of a dual-headed workstation, on X terminals (Solaris based only), and/or on remote workstations (Solaris based workstations and Windows based terminal server clients). This feature provides the convenience of monitoring and/or maintaining the process from multiple locations, such as from a central control room, from a terminal in the plant area, or from a terminal located on another network logged into the Foxboro Evo Control Network.

The Alarm Manager allows multiple unique alarm display windows to be simultaneously viewed, thus providing different perspectives of the alarm database.

ALARM MANAGER DISPLAYS

The Process button in the FoxView display manager window indicates the presence of alarms (both acknowledged and unacknowledged) and provides access to Alarm Manager displays. By default, the Current Alarms Display (CAD) appears and the other displays are easily accessible from the CAD via its default Displays menu:

- Most Recent Alarms display (MRA)
- New Alarms display (NEWALM)
- Unacknowledged Alarms display (UNACK)
- Acknowledged Alarms display (ACKALM)
- Alarm History display (AHD)
- Operations display (OPR).

These easy-to-use displays support the following features:

- A pre-configured number of alarms per screen or page
- Pre-configured alarm message information and formatting per alarm type
- A status area for indication of current Alarm Manager and display status, such as horns muted, match active, display paused, initial call-up time
- Single or multi-state buttons for responding to alarm conditions, such as acknowledging or clearing alarms, and for accessing additional alarm information and process displays
- Pull-down menus for edit, view, and file functions
- A pull-down menu for accessing other displays
- Pop-up menus for quick access to commonly used functions
- A scroll bar, scroll by time command, and Go To Page option for moving easily through the alarm list.

Although a preconfigured set of alarm displays is provided, many aspects of the displays and alarm message content are user configurable to accommodate different process control applications and operational needs. See the section on Alarm and Display Manager Configurator (ADMC).

Current Alarms Display

The Current Alarms Display with automatic refresh provides a dynamically changing list of all current alarms. Alarms appear, by default, every three seconds according to the specified alarm sort order – chronological sequence, priority, and/or acknowledged status.

Acknowledging an alarm shifts the alarm message to a new position in the display list; clearing an alarm removes the alarm from the alarm database and subsequently from all alarm displays. Access to process displays in a separate FoxView display manager window is available via the Block Detail, Top Priority, and User Display buttons.

The number of alarms in the alarm database is indicated in the status area. The scroll bar, scroll by time function, and Go to Page function allow you to navigate through the entire alarm database.

Most Recent Alarms Display

As a single page of the most recent unacknowledged alarms, the Most Recent Alarms Display as shown in Figure 1 presents new alarms every second. Unlike the CAD, alarm messages are not repositioned when newer alarms appear; the oldest alarms are overwritten by newer alarms.

The Alarm Manager dynamically updates the MRA display with changes received from the control station to the alarm parameter values for analog measurement and output as well as the status of alarms. The position of each alarm message is maintained until an operator-initiated refresh rereads the database, eliminating acknowledged, returned-to-normal alarms and alarms cleared from the database.

Alarm Summary Displays

The three multi-page alarm summary displays provide quick, easy access to information in the alarm database based on alarm status at the time of display:

- The New Alarms display provides a list of all active, unacknowledged alarms.
- The Acknowledged Alarms display lists all active, acknowledged alarms.
- The Unacknowledged Alarms display shows all unacknowledged alarms that have returned to normal.

Once the displays are invoked, the set of alarm messages remains constant; however, like the MRA display, alarm message values and status information continue to update. An operator-initiated refresh rereads the database and presents a new set of alarms depending on their current status. For example, operator-acknowledged alarms on the NEWALM or UNACK display appear on a subsequent callup of the ACKALM display.

For a complete view of the alarm database, use the View All mode. As with other displays, this alarm database information can be saved to a file or printed for analysis.

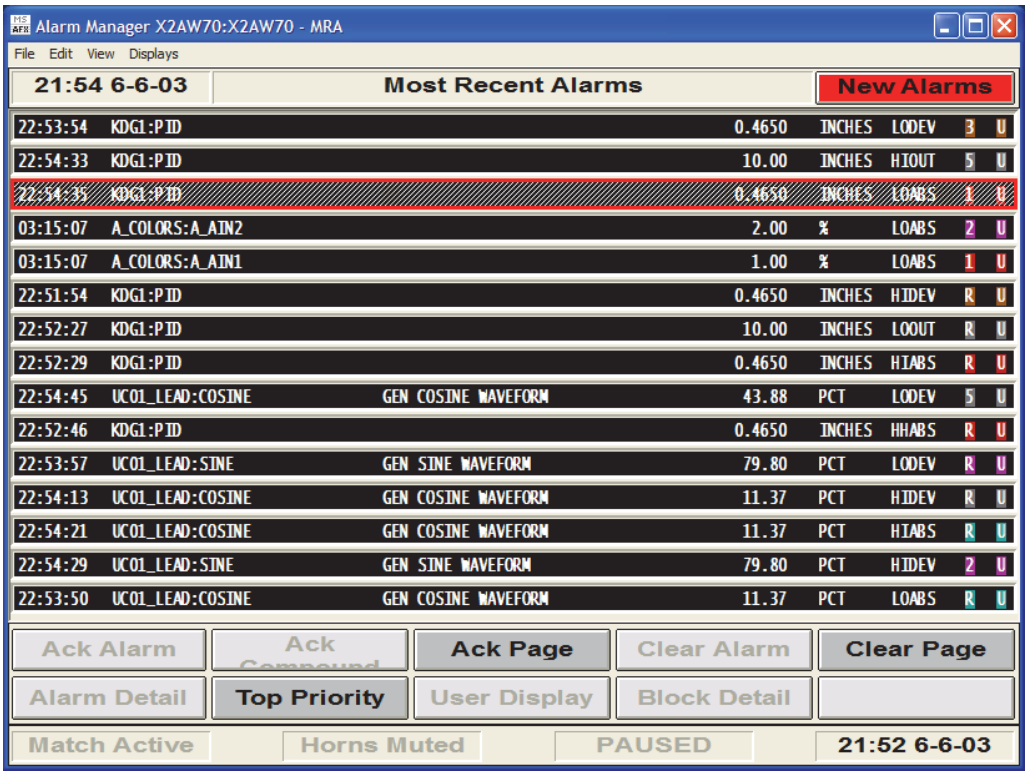


Figure 1. Most Recent Alarms Display

Alarm History Display

The multi-page Alarm History Display provides a complete list of all the alarm and return-to-normal messages from a selected Historian. Specific historic alarm information is quickly accessible and displayed as a subset of the entire historical database via the Alarm Manager match/filter feature. See Match and Filtering Features.

The display enables easy access to information from any Historian on the system via an Historian selection box. It also provides access to process displays in a separate FoxView display manager window.

Operations Display

From the Operations display, workstation and annunciator keyboard horns can easily be silenced or temporarily muted locally or throughout a group of workstations. Additionally, the Operations display allows you secured access to all HMI environments having varying degrees of security.

ALARM DISPLAY FEATURES

Alarm Messages

Quickly focusing in on the latest high priority alarms is essential in resolving alarm conditions. The CAD and MRA displays present the latest alarms. The set of alarm displays emphasize priority and status by utilizing:

- An alarm sort order (not applicable to the MRA or AHD displays)
- Color-coded (and optionally blinking) alarm priority numbers
- Status indicators for unacknowledged or returned-to-normal alarm messages.

The user-configurable alarm sort order is by any or all of the following:

- Return-to-normal versus in-alarm
- Acknowledge state
- Priority
- Time.

The displays can be dynamically re-sorted at run time.

Additionally, a user-configurable return-to-normal action allows you to:

- Retain the return-to-normal alarm in the alarm database until acknowledged, or
- Remove the return-to-normal alarm from the database regardless of the block acknowledgment state.

Each alarm message by default provides the following information as shown in Figure 2:

- Date and time
- Compound name
- Block name
- Variable text, depending on alarm type
  - Block descriptor and updating value
  - State text
  - Optional text and state text.
- Alarm state (alarm priority or return-to-normal indicator)
- Acknowledge state.

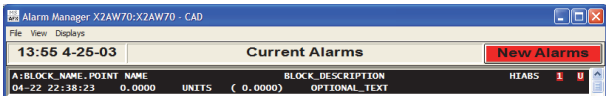


Figure 2. Example of an Alarm Message

Indicators, representing the alarm state and acknowledge state, appear in the alarm message in foreground or background colors depending on the current status:

- Color-coded alarm priority numbers 1 - 5
- R for an alarm that has returned to normal
- U for an unacknowledged alarm.

The Alarm Detail button accesses additional alarm information displayed in the Detail dialog box as shown in Figure 3. The capability to configure alarm message fields allows you to determine a subset of alarm information for the display, yet have access to complete alarm information via the detail dialog box.

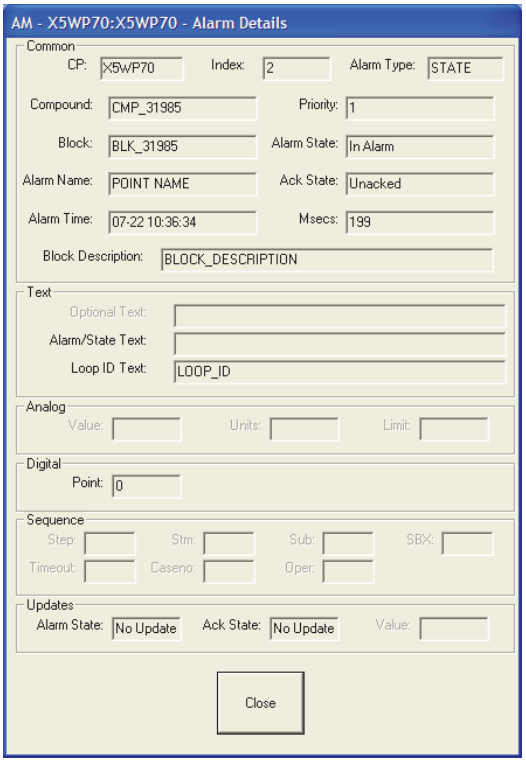


Figure 3. Alarm Message Details Dialog Box

Acknowledge and Clear Actions

You can select alarms individually or as a group for acknowledging and clearing the alarms. You can also specify the selection criteria for a subset of alarms using the Find dialog box. Each alarm matching the criteria is highlighted to show selection. A subsequent action, such as acknowledging alarms or clearing alarms, can then be performed on the selected alarms.

The Ack Alarm, Ack Page, and Ack Compound buttons allow you to acknowledge alarms by selection of an individual alarm or a set of alarms. Ack Alarm and Ack Page acknowledges all alarms in the block in which the selected alarm(s) occurred. Ack Compound acknowledges all alarms in all the blocks of the compound in which the selected alarm(s) occurred. The Clear Alarm and Clear Page buttons clear alarms from the alarm database.

Remote Alarm Source

By default, the Alarm Managers on a workstation are set up to get alarm data from the local alarm database. However, Alarm Managers can display alarms from an alarm database on a remote workstation.

There are several advantages to accessing alarms from a remote database, including to:

- Allow all alarms to be viewable from any workstation
- Allow users normally monitoring alarms for one area of the plant to be able to switch over and monitor alarms from a different area of the plant
- Allow users to monitor alarms from more than one area of the plant from a single workstation
- Provide for alarm message redundancy, thus eliminating single point of failure.

Match, Filtering, and Sorting Features

The extensive match/filtering/sorting feature provides the flexibility of viewing any subset of alarms from those currently displayed. It allows you to define customized match, filter, and/or sort specifications that, when applied to the display, allow you, for example, to:

- Focus on critical alarms
- View only sequence alarms for specific control compounds
- Filter out nuisance low priority alarms during a startup condition
- Filter out alarms from particular compounds or control stations
- Sort the alarm entries by return-to-normal/in-alarm, acknowledge state, priority, and/or time.

When viewing an extensive list of historized alarms, you can easily view just the alarms that occurred during a specific timeframe, such as a day or shift, or those alarms related to a specific block or compound over a period of time.

For comprehensive matching and filtering, the match/filter specification fields, as shown in Figure 4, support:

- Wild-card characters for single and multiple characters within entries
- Multiple entries per field
- ORing of multiple entries per field
- ANDing among multiple fields.

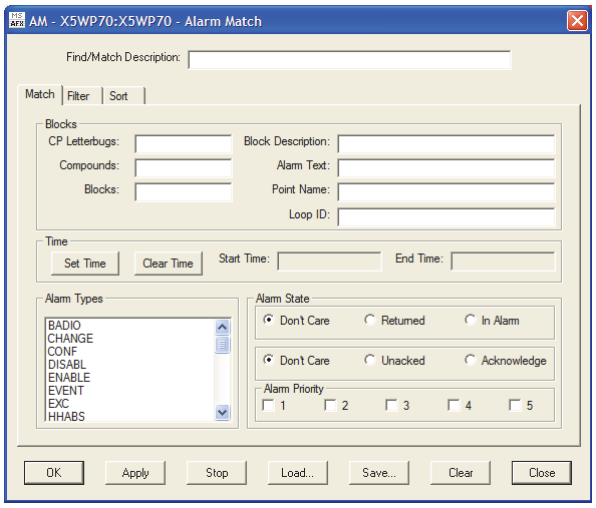


Figure 4. Match/Filter Specification Dialog Box

Saving match/filter specifications to a file allows you to re-apply the match/filtering specifications to the display(s) when needed. Assigning a pre-configured match/filter specification to a menu or button allows you to quickly and easily invoke a specific view of the alarm database. Refer to the Alarm and Display Manager Configurator (ADMC) section.

For safety, the status area of the display indicates "Match Active" when a match specification is applied to the display. This indicates that only a subset of alarms are visible.

Process Display Access

For additional information or to respond to alarm conditions, the following buttons provide access to a process display corresponding to the highest priority alarm or to the selected alarm:

- Top Priority
- User Display
- Block Detail.

A process display appears in the window of the FoxView display manager with which the Alarm Manager is associated. Therefore, you have the advantage of viewing the process display and the alarm displays at the same time. Alternately, process displays can be redirected to another workstation or a specified FoxView display manager depending on your operational requirements.

On Solaris based workstations you can access the 'Windows Off' mode. In 'Windows Off' mode, each CRT supports one open display window – either the Alarm Manager window or the FoxView display manager window.

File Utilities

Easy-to-use file utilities allow you to:

- Save the contents of all alarm display messages to a file in normal format (as displayed) or Comma Separated Value (CSV) format
- Print alarm display messages.

Alarm information in CSV format is easily imported into spreadsheets such as Lotus or Excel or databases such as Access for further analysis.

On Solaris based workstations selection of a printer and print script allows you to print alarm messages or a previously saved file in a selected format, such as:

- Two columns representing two pages
- A header that includes the page number and time and date of printing.

Print scripts are easily edited to meet your report format needs.

On Windows based workstations, printer setup, page setup, and print preview allow you to format, preview, and print the alarm messages. WYSIWYG printing of the alarms is supported.

OPERATIONS DISPLAY FEATURES

The default Operations display provides secured password access to other HMI environments with specific user or system responsibility permissions. Authorized users can access environments or system responsibilities depending on the access levels and protection codes configured for each environment as well as for the alarm and process displays.

The Horn menu provides workstation/annunciator horn management. You can:

- Silence local workstation/annunciator horns
- Silence all horns associated with workstations/annunciators in a predefined group (Common Alarm Group)
- Temporarily shut off the local horns
- Temporarily shut off all horns in the Common Alarm Group.

For safety, notice of temporary horn muting appears in the status area of each Alarm Manager display.

ALARM AND DISPLAY MANAGER CONFIGURATOR (ADMC)

To meet your process control operational needs, the Alarm and Display Manager Configurator allows you to customize the various Alarm Manager and display manager settings and many aspects of the Alarm Manager displays, including:

- Configure additional Alarm Managers
- Configure additional display managers
- Configure workstation properties, such as:
  - Maximum number of alarms and sort order
  - Horn settings
  - Color and blink settings for alarm states.
- Configure Alarm Managers and display managers to run on remote terminals
- Change default startup settings for display manager
- Change default startup settings for Alarm Manager
- Change the interface for each alarm display:
  - Menus and menu commands
  - Buttons (single and multi-state)
  - Number of alarm message rows and columns
  - Pop-up menu contents.
- Configure indicators in the title bar and status bar
- Change the alarm message contents and format for each alarm type:
  - Alarm fonts, foreground and background colors, alarm state indicators, time and date format, field layout
  - Alarm text fields per alarm type.

Alarm Manager User Interface

The Alarm and Display Manager Configurator allows you to configure many aspects of the user interface including the alarm message information and format.

Workstation Property Scheme

From the Workstation property scheme you can configure station-wide settings, which include:

- Maximum number of alarms, alarm discard sort order, return-to-normal action, clear alarm, and alarm recovery options
- Horn mute timeout, horn silence, horn resound, horn silence key, and horn feedback options
- Alarm text update and update priority options

- Color and blink rate settings for unacknowledged, acknowledged, and unacknowledged return-to-normal alarms; and alarm selection rectangle color
- Maximum number of alarms and maximum number of annunciator table assignments
- "Top Priority" command association and display update options.

Display Manager Property Scheme

From the Display Manager Property scheme you can configure/customize properties such as:

- Display manager class (for example, operator or engineer)
- Initial HMI environment in which the FoxView display manager starts up
- Initial display size and position, and resizing options.

Alarm Manager Property Scheme

From the Alarm Manager Property scheme you can configure/customize properties such as:

- Alarm Manager class (for example, operator or engineer)
- Initial alarm display type
- Action to be taken upon the receipt of a new alarm
- Initial size and position of each alarm display type
- Specific parameters associated with the display type, such as alarm pause timeout and alarm refresh rate for dynamic displays.

User Interface Scheme

The flexibility to customize the user interface scheme allows you to view alarm information according to your presentation needs. Within the user interface scheme you can configure:

- The number of alarm rows and columns on the display
- The content of the menu bar
- The menu content or command associated with each menu bar field
- The label on each button and the state, access code, condition, and command associated with it
- A pop-up menu for quick access to frequently used commands
- Title and status bar.

Alarm Format Scheme

Fonts, indicators, color-coding, and content of the alarm information per alarm class or alarm type are easily customized using a wide variety of fonts, colors, and the cell editor. You can configure the:

- Alarm cell font
- Alarm cell color based on, for example, priority, alarm type, or status
- Font for the alarm state and status indicators
- Indicators using, for example, text or symbols instead of priority numbers and R and U
- Time and date format
- Cell contents for the generic classes as well as each alarm type within the following generic classes:
  - Analog
  - Digital
  - Message
  - Other.
- Size and layout of alarm fields within the alarm message cell
- Overrides for cell and field font and color.

ALTERNATE ALARM DISPLAYS

In addition to the standard Alarm Manager Displays, Foxboro® provides additional schemes to aid in customizing displays. These alternate display presentations include:

- A horizontal strip with a single alarm
- A horizontal strip with five columns each with a single alarm
- A vertical column strip with ten numbered alarms
- A grid with two columns by fifteen rows of alarms
- A grid with five columns by ten rows of alarms
- A grid with one column by ten rows with large text indicators.

See Figure 5, 6, 7, 8, and 9.

Strip displays are designed to be used with standard sized FoxView displays. Quarter-sized alarm displays can be used with quarter-sized FoxView displays.

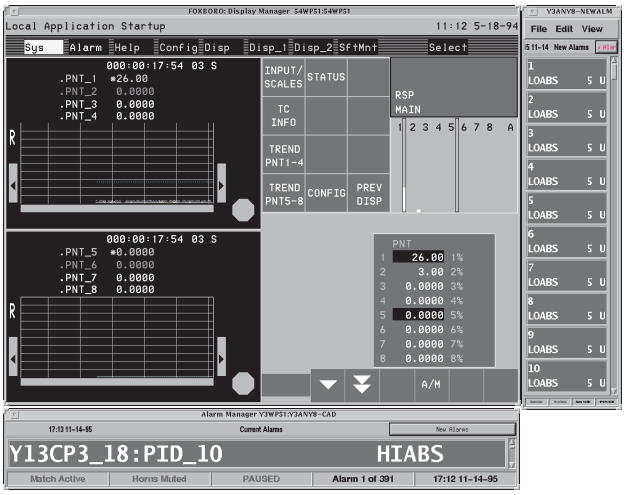


Figure 5. Examples of Horizontal and Vertical Strip Formats with Foxboro Default Size Display Manager

SPECIAL FEATURES

Alarm Manager built-in commands and keywords allow you to utilize alarm tasks and information in other applications. AM built-ins are normally used for configuring button actions, menu items, and new alarm actions. Keywords and modifiers are used to indicate the contents of each alarm type message. At run time the Alarm Manager replaces the keywords with text derived from the alarm messages generated by the control software.

These built-ins and keyword features extend the functionality of the Alarm Manager. They facilitate a link from the Alarm Manager to your own applications to meet your plant-specific needs. For example, the operator instructions for a selected alarm could be called up from a user-defined alarm response manual application. Or, you could select a point that is in alarm and trend it automatically.

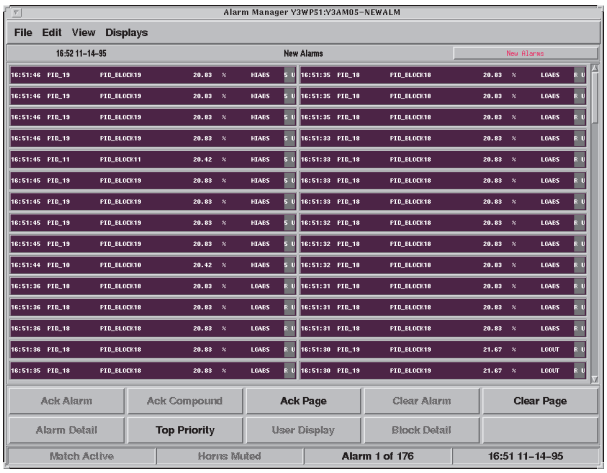


Figure 6. Example of 2-Column 15-Row Format for New Alarms Display

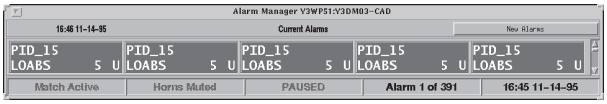


Figure 7. Example of 5-Column Horizontal Strip Format for Current Alarms Display

HARDWARE SPECIFICATIONS

The Alarm Manager runs on I/A Series Solaris based workstations and Foxboro Evo or I/A Series Windows based workstations. The Alarm Manager is part of the standard human interface software included with your workstation.

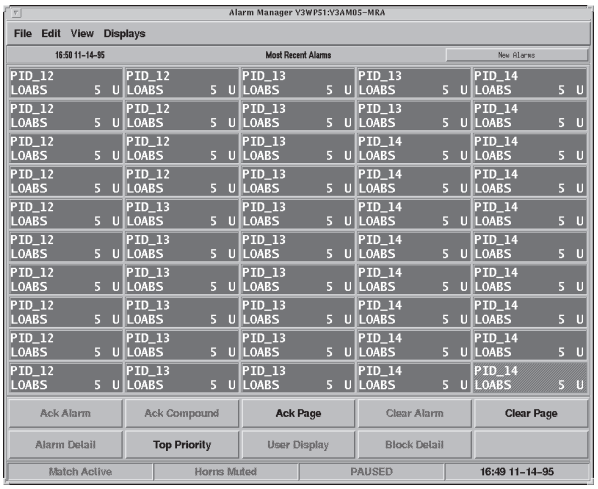


Figure 8. Example of 5-Column 10-Row Format for the Most Recent Alarms Display

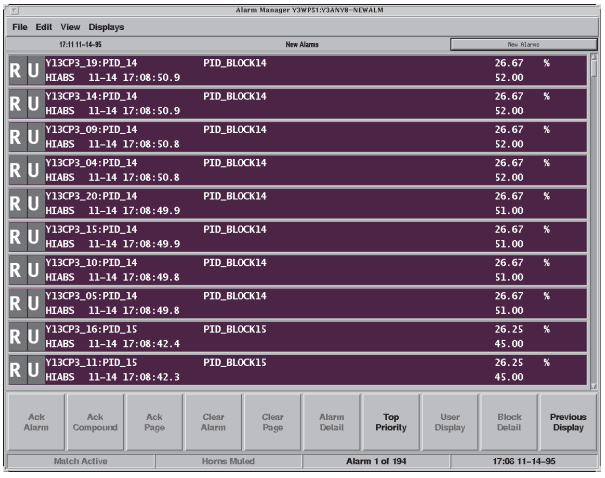


Figure 9. Example of Enlarged Status Indicators and Square Buttons

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