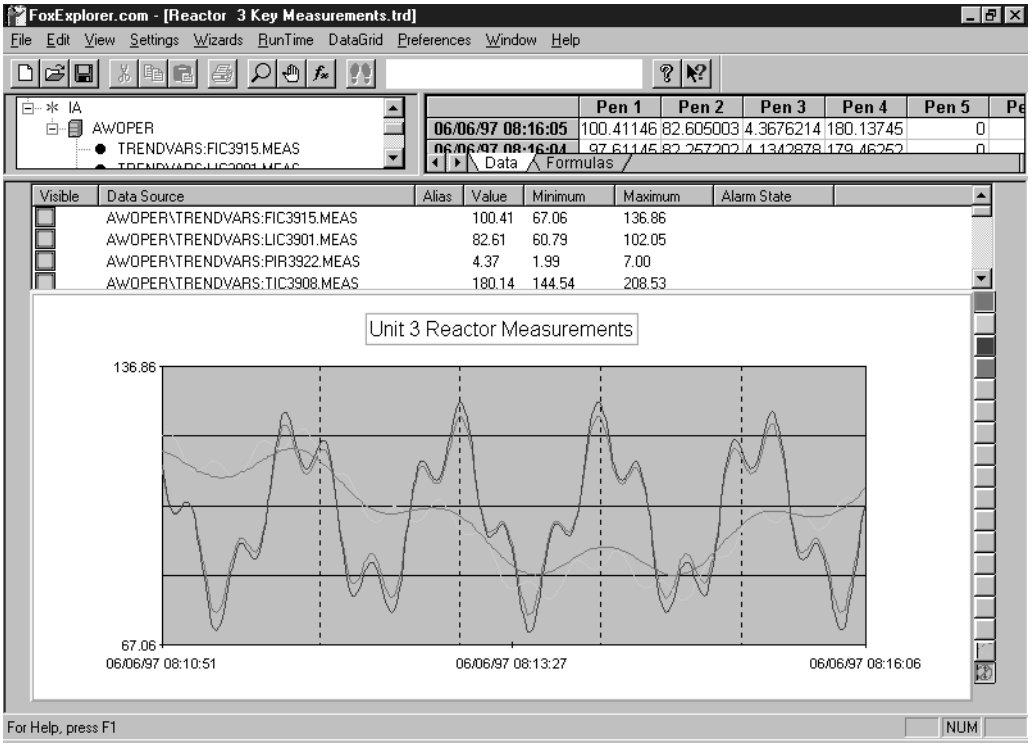
FOXBORO®

PSS 21S-7A5 B3

I/A Series® Information Suite
AIM*Explorer™



*AIM*Explorer is a PC desktop tool for visualizing and exploring real-time and historical process data served from I/A Series systems and other data servers. AIM*Explorer features three different window types: Real-time trends (above) that dynamically track up to 16 data objects; charts of historical data from multiple historians; and Batch™ events that compare completed batches monitored by AIM*Track™ and the I/A Series Batch Set.*

Introducing AIM*Explorer

The AIM*Explorer software package allows you to obtain visual displays of historical and real-time process data, including the ability to:

- Create, modify, and save real-time trends from the I/A Series system and other Distributed Control Systems (DCS)
- Display process information from connected historians in a wide variety of chart formats
- Chart batch events and related process variables sourced from AIM*Track and the I/A Series Batch Set databases
- Monitor up to 16 sources of data simultaneously
- Zoom into selected areas of any chart
- Switch the chart between normal and banded data presentations
- Select and display charts from reduction group data

- Use a marker bar and a statistical toolbox to examine data in detail
- Time-shift historical chart data and make visual comparisons
- Create various charts to analyze the data
- Define a data transform as a mathematical function of one or more other data sources
- Display the data values and transform results as they are obtained.

AIM*Explorer Features

Multiple Chart Styles

AIM*Explorer allows you to build real-time and historical trend charts, bar charts, area charts, or stacked bar charts easily. Each chart style can be further configured with scaling, color, and marker options to show your data with maximum clarity.

Library of Charts

Charts are easily saved and reused with AIM*Explorer. Any trend or chart definition can be saved in a file, used again, and shared with others.

Cut and Paste

AIM*Explorer has the ability to copy trend and spreadsheet data to the Windows™ clipboard. The Trending Area can be copied either as a bitmap file or metafile. Numerical data or formulas can be copied from the spreadsheet area directly into spreadsheet programs such as Microsoft™ Excel™.

Wizards

AIM*Explorer has built-in wizards that can assist you step-by-step in creating a trend or chart.

Windows OLE Support

AIM*Explorer supports the drag-and-drop operation between the Data Object Tree and the Trending Area. You select data sources from the Data Object Tree and drag them into the Trending Area.

Windows Help

AIM*Explorer is supplied with a Microsoft Windows Help file. The Help file contains the complete user's guide with index and keyword search features. In addition, run-time context-sensitive Help is available by clicking the mouse button over an item or by pressing the F1 key.

Windows Registry Support

AIM*Explorer uses the Windows Registry to store the default configuration settings. These settings are used when a new session is started, but can be modified with the Preferences menu.

Windows Style Guidelines

AIM*Explorer has a visual and interactive functionality consistent with the Microsoft Windows operating system – the same functionality that is used in other Windows applications.

Controlled Memory Usage

AIM*Explorer allows you to determine how much data is active in the program via how many data points to collect. When the limit of data points is reached, the next data point collected causes the first data point to be discarded, thereby limiting the set of system resources.

Automatic Screen Management

AIM*Explorer was designed to give the maximum amount of screen area to the actual trending object. In real-time mode, the time-shifting controls disappear to allow the trending object to use more screen area. If you further reduce the size of the window, the list view control likewise becomes invisible, keeping the Trending Area at the maximum possible size, even on the small screens of laptop PCs.

Operations

AIM*Explorer analytical displays use AIM*AT™ servers to access data from three different sources:

- AIM*Explorer trend windows read values in real time from I/A Series data objects using AIM*API™. (When a trend window is started, the immediate history of the selected objects are read from connected historians if the objects are historized.)
- Charts derive values from connected AIM*Historian and I/A Series Historian™ instances. For comparative analysis, you can select two time frames for the same objects.
- Batch Event windows display event time lines and associated process variables as monitored by AIM*Track or the I/A Series Batch Suite. When employed with either batch module, AIM*Explorer provides a wizard for accessing selected event data. (Batch Event windows also allow you to relate events to objects selected from connected AIM*Historians.)

For trends and charts, you can configure up to 16 data objects (also referred to as pens). The objects can be sourced from either a database point or a mathematical expression that may include any combination of other pens. When you request a data collection, AIM*Explorer gets historical data for the requested time range, performs the specified calculations, and continuously adds the latest real-time and calculated data.

The user interface of AIM*Explorer is made up of four functional components:

- Data Object Tree
- Spreadsheet Area
- Data Object List
- Trending Area.

When the Batch Event option is installed, AIM*Explorer also includes a fifth component, the Segment Browser.

Trend Windows

Descriptions of how the functional components are used to create Trend windows follow.

Data Object Tree

This component allows you to select which data objects to use in the Trending Area. You make your selection from a hierarchical tree showing all the I/A Series servers, stations, and the control object names in those stations (Figure 1) and then copy them to the pens in AIM*Explorer by dragging them to the Data Object List.

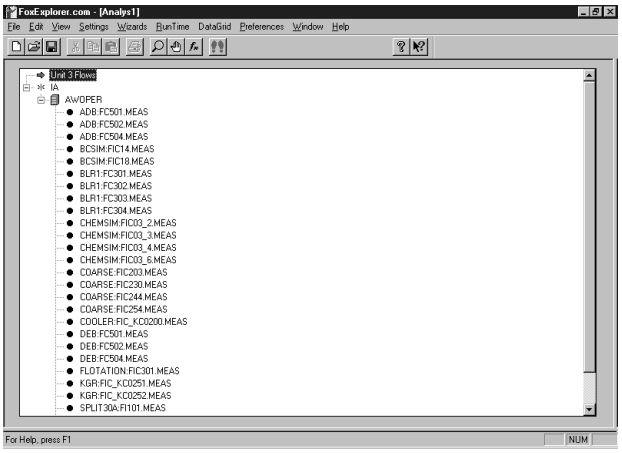


Figure 1. Data Object Tree (shown expanded)

Spreadsheet Area

The spreadsheet component is made up of two worksheets. One worksheet allows you to define mathematical formulas that AIM*Explorer uses for a data pen (Figure 2). The formula can simply display the current value of the object, perform a calculation such as a rolling average and display the result, or combine values from objects connected to other pens. The spreadsheet follows Microsoft Excel conventions for the formula syntax.

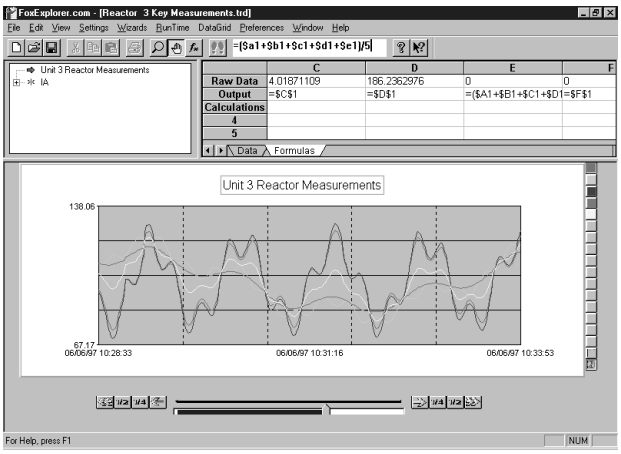


Figure 2. Spreadsheet Formula Entry

The second worksheet shows the data values which are displayed in the Trending Area (including calculations). The data values appear in red if the control object is in an alarm condition, otherwise they appear in black. Calculated values appear in blue (Figure 3).

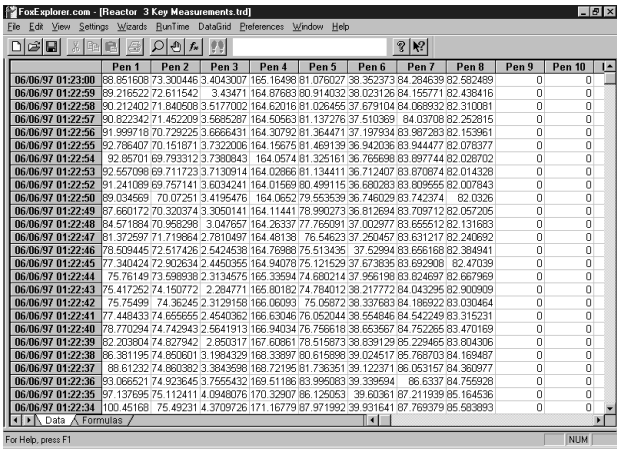


Figure 3. Spreadsheet Area (shown expanded)

Data Object List

To select objects for use in a Trend window, you drag an object from the Data Object Tree and drop it into the Data Object List, which is displayed above the Trending Area. For each selected object, the Data Object List shows the object source; a description; the current, minimum and maximum values of the object; and the status of alarms configured within the AIM*Explorer application (Figure 4). The Visible attribute in the Data Object List allows you to toggle the display of the object in the Trending Area on and off.

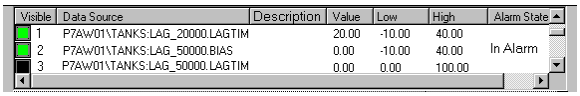


Figure 4. Data Object List

Trending Area

The Trending Area displays the currently visible pens, and scrolls the data to keep the most current data visible. The user determines which pens are attached to data sources; the visible settings for each data pen; display options for the trend; the scaling factor for each pen; and the time range for data collection. While data collection is active, you can:

- Zoom in on one part of the graph
- Perform time-shifting operations to compare data at different times
- Obtain real-time statistics
- Freeze the current screen while the data collection continues in the background
- Change each pen's scaling option or value
- Change the time range that is displayed on the trend
- Make pens visible or invisible.

Scaling Options

Individual Pen Options

You can set AIM*Explorer to display each pen on its own individual scale or display all pens using a global scale. The individual scale options are as follows:

- Auto – the maximum and minimum values for the value axis are dynamically determined from the data.
- System Default – the maximum and minimum values for the value axis are obtained directly from the I/A Series Object Manager database.
- Hi-Lo – you set the maximum and minimum values for the value axis.

Global Pen Options

You can set AIM*Explorer to display the pens in one of the following ways:

- Each Pen Full Screen – each visible pen is scaled to use the entire size of the trend's value axis. The maximum and minimum values are set by the individual pen's scaling option.
- Each Pen Non-Full Screen – the maximum value for the value axis is set by finding the largest number in each visible pen's current scale. The same is done to determine the minimum value. If the global autoscale option is set, the maximum and minimum values for the value axis are determined dynamically.
- Banding – each visible pen is given a range of the value axis. This allows you to see all of the visible pens without any overlap.

When you press a corresponding button on the side of the trend, the value axis displays the pen's maximum and minimum values. When the banding option is activated, these values appear at the top and bottom of that pen's display range on the value axis.

Time Span of Data Collected

There are two factors used to determine the amount of data collected by AIM*Explorer: the Trending Area data and the underlying data store.

Trend Window Data

You set the time span of the Trending Area and the sampling frequency. The number of data points to be displayed in the window is the product of the time span in seconds divided by the sampling frequency.

Data Store

You set a factor that is the number of data points in the underlying data store. The data store is used so that you can time shift the data that is in the Trending Area. The number of points in the data store is the product of the number of points in the Trending Area data set multiplied by the data store factor.

Chart Windows

AIM*Explorer Chart windows are used to display process information sourced from connected AIM*Historians and other databases. Charts use the same components as Trend windows, but allow additional flexibility in selecting and analyzing process data. For example, the same object can be assigned to multiple pens so you can compare the values of different time frames. Slider bars for each time frame allow you to shift the data in one time frame independently or in relation to the other time frame. Figure 5 shows an AIM*Explorer Chart using two time frames for time-shifted analysis.

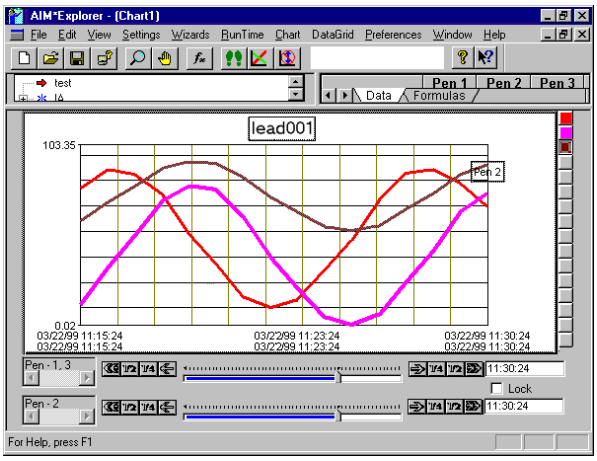


Figure 5. Chart with Two Time-Shifting Sliders

Chart formats (Figure 6) include two- and three-dimensional stacks, boxes, and filed areas. Three-dimensional stacks can be rotated and tilted forward to enhance perspective on the historical data.

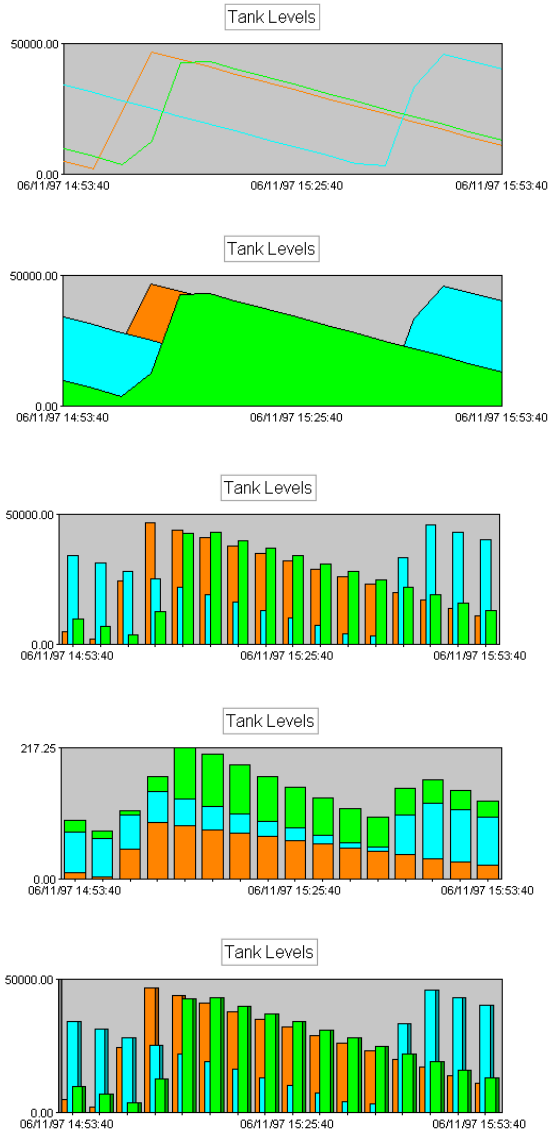


Figure 6. Typical Chart Formats

Batch Event Windows

When the Batch Event option is installed, AIM*Explorer includes the Segment Browser component, which is similar to the Data Object Tree. The browser shows a hierarchy of batches, events, and related process variables defined in an AIM*Track or I/A Series Batch Set database (Figure 7).

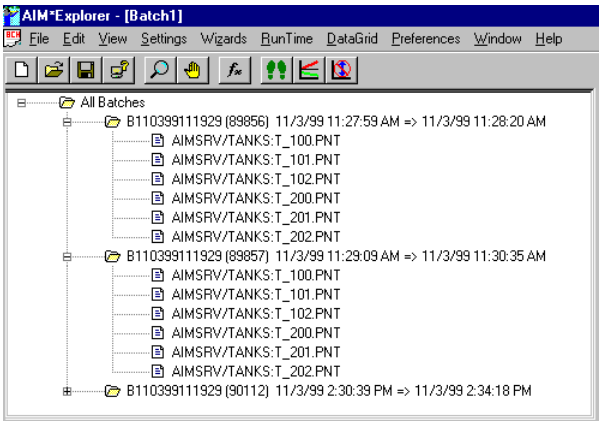


Figure 7. Segment Browser

To display batch events, you drag objects from the Segment Browser and drop them in the Data Object List. You can also add objects from the Data Object Tree and associate them with a batch.

Batch Event Trending Area Display

In a Batch Event window, the Trending Area displays the selected batch events on a time line and shows the changes with the associated process variable during each batch. You can arrange the display into separate bands for each data item, or plot the process variables on the batch event time lines. The batch events are identified with callouts based on definitions in the AIM*Track or I/A Series Batch Set database. You can selectively enable these callouts to determine their positions and modify the style to enhance your understanding of the display.

Figure 8 shows a banded Trending Area display with callouts identifying events on two batch event time lines.

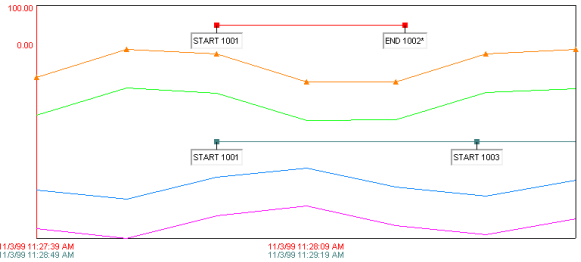


Figure 8. Banded Batch Events Display

Notes and Other Tools

In Batch Event windows, two worksheets are added to the spreadsheet tool in the upper right corner of the window: Batch Events and Batch Notes.

The Batch Events sheet lists events in the selected batch using information defined in the AIM*Track or I/A Series Batch Set database.

The Batch Notes sheet lists annotations which you and other users append to displayed batch events. AIM*Explorer provides an easy-to-use dialog box for entering notes and reviewing previous annotations.

Batch Event windows also include on-screen tools for measuring elapsed time between events and between events and variables reaching a specified value (Figure 9).

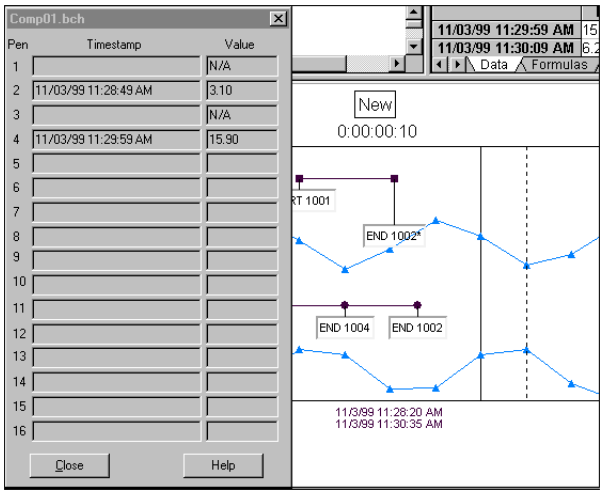


Figure 9. Time Marking in a Batch Event Display

EASE OF USE FEATURES

Registry Settings

The following parameters are stored in the Windows Registry to be used as the default settings:

- Axis Mode
- Pen Characteristics
- Time Axis Settings
- Chart Settings
- Spreadsheet Settings
- Data Store Factor.

You can save the current settings as new default settings any time.

Stored Setups

Each trend, chart, and batch event window can be saved to a file for later analysis, for export to other users, and as a template for similar applications. In addition to the data store, the file includes the object view, the data object selections, calculations, and Trending Area formatting. When you access a saved window, AIM*Explorer assists you in displaying the saved data, starting a new data collection, or modifying the setup.

Data Object Wizard

The built-in Data Object Wizard is a step-by-step guide for specifying data object views. A view is a set of process data objects from one or more I/A Series servers. Figure 10 shows an example of the wizard. In this example, a user has specified data from one control processor. Note the use of a filter to select particular station names (stations beginning with C).

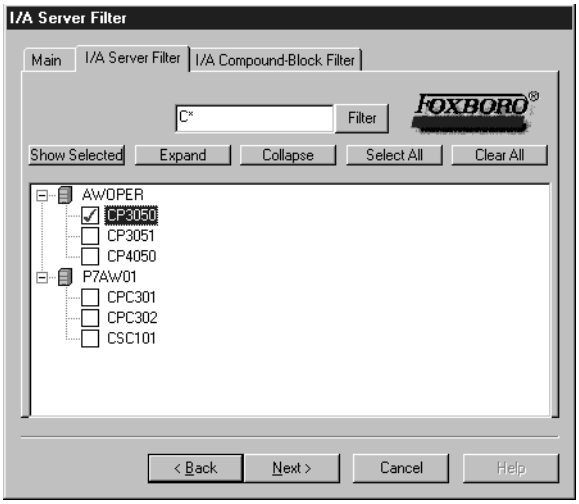


Figure 10. Wizard Example with Station Filter

Filtering can also be used to select compound or block names from I/A Series systems. Figure 11 shows a wizard which is filtering for I/A Series block names that begin with FC.

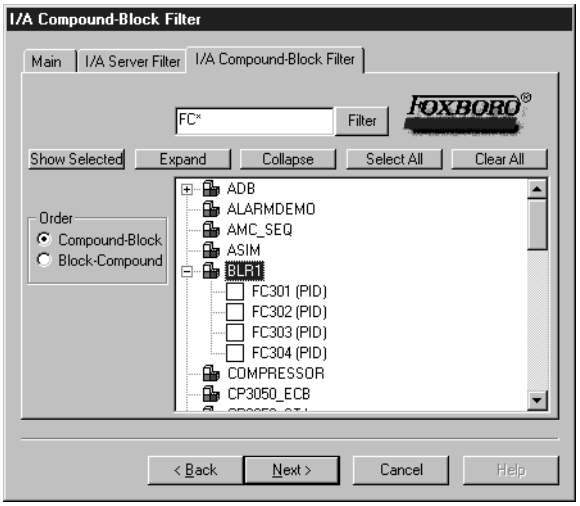


Figure 11. Wizard Example with Block Name Filter

Segment Browser Wizard

The Segment Browser Wizard provides a series of database query filters to select data from an AIM*Track or I/A Series Batch Set database. The selected data items are displayed in the Segment Browser. Similar to the Data Object Wizard, this tool allows you to construct a query using multiple criteria, and then make a final selection of data items from the returned values. Figure 12 shows a filter page in the wizard for selecting data items based on equipment defined in the AIM*Track or I/A Series Batch Set database.

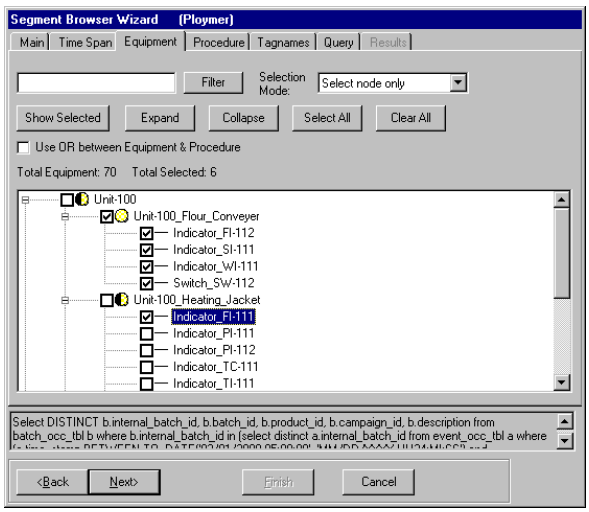


Figure 12. Segment Browser Wizard Equipment Page

Supported Platforms

AIM*Explorer is a client application that operates on a PC running Microsoft Windows 95™, Windows 98™ or Windows NT™ 4.0.

AIM*Explorer accesses real-time and historical data using an AIM*AT server, which can be on the same host or linked to the AIM*Explorer platform via a TCP/IP connection. The AIM*AT server provides the client authorization and access to connected I/A Series control databases, historian instances, and AIM*Track and I/A Series Batch Set databases. A single AIM*Explorer instance can be used to access multiple properly licensed AIM*AT servers.

To display AIM*Track event information, AIM*Explorer requires the AIM*Track Segment Browser installed on the same platform and authorized network access to the AIM*Track segment database.

To display I/A Series Batch Set event information, AIM*Explorer requires the I/A Series Batch Segment Browser installed on the same platform and authorized network access to the I/A Series Batch Set database.

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