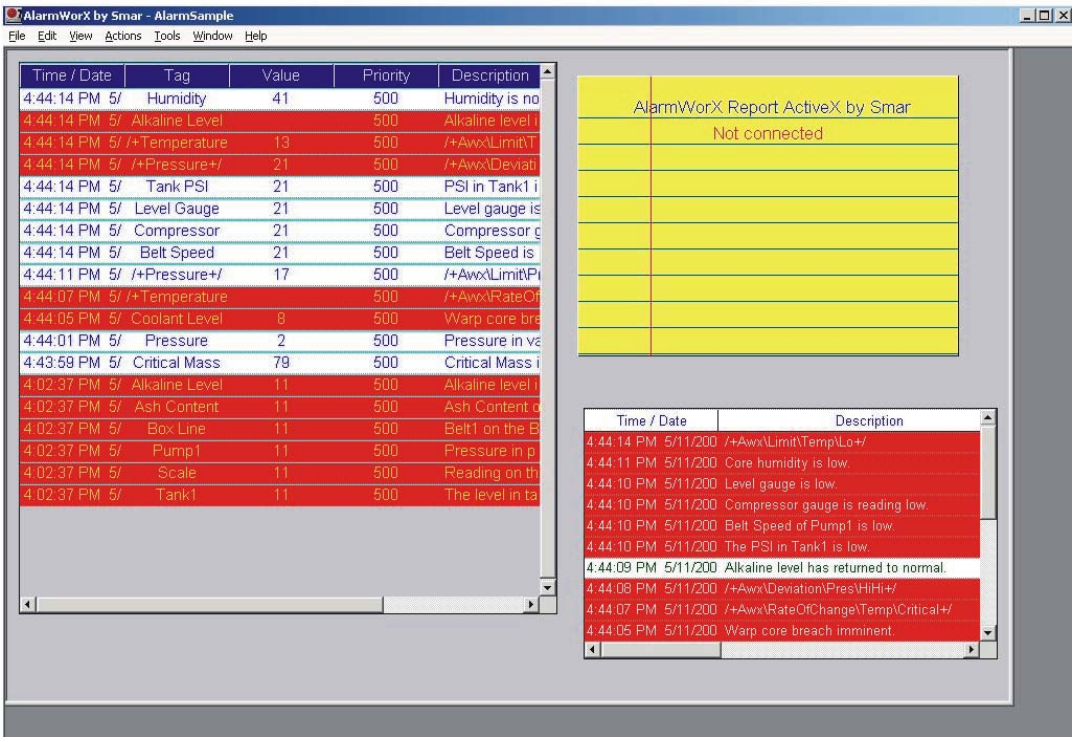
AlarmWorX

smar

FIRST IN FIELDBUS

INSTALLATION AND OPERATION MANUAL

AlarmWorX



JUN / 04

AlarmWorX

VERSION 7.1

FOUNDATION

PVIEWAWKME

smar

web: www.smar.com

Specifications and information are subject to change without notice.
For the latest updates, please visit the SMAR website above.

BRAZIL
Smar Equipamentos Ind. Ltda.
Rua Dr. Antonio Furlan Jr., 1028
Sertãozinho SP 14170-480
Tel.: +55 16 3946-3510
Fax: +55 16 3946-3554
e-mail: smarinfo@smar.com

ARGENTINA
Smar Argentina
Soldado de La Independencia, 1259
(1429) Capital Federal – Argentina
Telefax: 00 (5411) 4776 -1300 / 3131
e-mail: smarinfo@smarperifericos.com

CHINA
Smar China Corp.
3 Baishiqiao Road, Suite 30233
Beijing 100873, P.R.C.
Tel.: +86 10 6849-8643
Fax: +86-10-6894-0898
e-mail: info@smar.com.cn

FRANCE
Smar France S. A. R. L.
42, rue du Pavé des Gardes
F-92370 Chaville
Tel.: +33 1 41 15-0220
Fax: +33 1 41 15-0219
e-mail: smar.am@wanadoo.fr

GERMANY
Smar GmbH
Rheingaustrasse 9
55545 Bad Kreuznach
Germany
Tel: + 49 671-794680
Fax: + 49 671-7946829
e-mail: infoservice@smar.de

MEXICO
Smar México
Cerro de las Campanas #3 desp 119
Col. San Andrés Atenco
Tlalnepantla Edo. Del Méx - C.P. 54040
Tel.: +53 78 46 00 al 02
Fax: +53 78 46 03
e-mail: ventas@smar.com

SINGAPORE
Smar Singapore Pte. Ltd.
315 Outram Road
#06-07, Tan Boon Liat Building
Singapore 169074
Tel.: +65 6324-0182
Fax: +65 6324-0183
e-mail: info@smar.com.sg

USA
Smar International Corporation
6001 Stonington Street, Suite 100
Houston, TX 77040
Tel.: +1 713 849-2021
Fax: +1 713 849-2022
e-mail: sales@smar.com

Smar Laboratories Corporation
10960 Millridge North, Suite 107
Houston, TX 77070
Tel.: +1 281 807-1501
Fax: +1 281 807-1506
e-mail: smarlabs@swbell.net

Smar Research Corporation
4250 Veterans Memorial Hwy.
Suite 156
Holbrook , NY 11741
Tel: +1-631-737-3111
Fax: +1-631-737-3892
e-mail: sales@smarresearch.com

Index - AlarmWorX

Index – AlarmWorX Multimedia

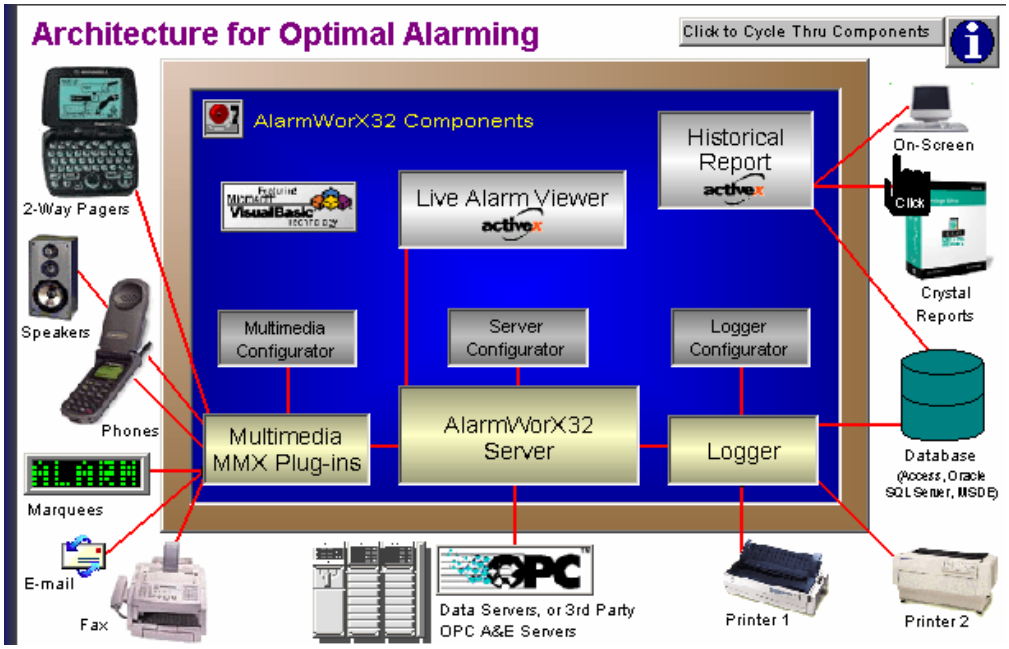
Chapter 1

Getting Started

About AlarmWorX

AlarmWorX is a distributed enterprise-wide alarm and events management system. Available in the standard ProcessView suite of application, or as a stand-alone Open Series component, AlarmWorX offers the tools you need to deliver real-time alarm information throughout your system. AlarmWorX is a family of modular alarming products, including the Alarm Container, the Alarm Server, the Alarm Logger, the Alarm Viewer ActiveX, the Alarm Report ActiveX, and the Multimedia Server. The Alarm Container is an ActiveX container capable of embedding various ActiveX components. The AlarmWorX architecture is shown in the figure below.

AlarmWorX is the first OPC-compliant alarming product based on the OPC Alarm and Events (AE) specification. It can easily "Plug and Play" not only with SMAR applications but also with other third-party OPC alarming software.



AlarmWorX Architecture

Alarm Container

AlarmWorX delivers a "Container" application, which can host not only the Live and Historical ActiveX controls, but also other third-party controls. It also offers the rich Microsoft Visual Basic for Applications (VBA) scripting language. Use this, or other containers (e.g., GraphWorX) to fulfill your alarm viewing needs.

Alarm Server and Server Configurator

Alarm Configuration is easy with the Alarm/Event Configurator. You can define your own alarms on any OPC data and/or expression (complex combinations of OPC data), choosing from analog limit alarms, deviation, rate-of-change, and digital alarms. In keeping with the open standards employed throughout the ProcessView architecture, your alarm configurations are saved to a Microsoft Access or Microsoft SQL Server database.

Once the alarms are configured, the OPC Alarm Server takes care of monitoring the live data, posting new alarms throughout your network. This component runs in the background (even as a Windows NT Service if desired), and is tuned to give your system the performance required of an alarming system.

The AlarmWorX Server receives field data from any OPC-compliant Data Access (DA) server and performs alarm detection and reporting based on the OPC data sent to any OPC Alarm and Event (AE) clients that subscribe. The AlarmWorX Viewer and the AlarmWorX Logger are two examples of clients that can receive these notifications from the server.

Alarm Logger

The **AlarmWorX Logger** logs alarms to Microsoft Access, Microsoft SQL Server, or Oracle databases. It also can print out the information to one or even a redundant set of printers. You can create alarm reports and calculations with Microsoft's built in Visual Basic for Applications (VBA) scripting language. Alarm calculations can be performed on individual tags or groups of tags.

The logger can run as an executable or a service and is able to process alarm information from several alarm severs locally or over a network. The database is user-configurable (i.e. it allows autoflushing at a specified period, autostart, circular and append logging modes, etc.). Of primary importance to the database issue is performance. The logger is able to handle bursts of alarms due to the design and implementation of the logger's database handling.

Live Alarm Viewer ActiveX

The **Alarm Viewer** is a current-events alarm ActiveX. Because this component is an ActiveX, it can be placed in any ActiveX container application, such as GraphWorX, Microsoft Visual Basic, or a Web page. The Alarm Viewer displays current alarm information and handles the user interface to the alarm system (such as alarm acknowledgement). The layout of information displayed, including sort order, color, font, and displayed data, is user-configurable.

You can drop this ActiveX Control in the provided AlarmWorX Container, within any GraphWorX HMI Display, an HTML Internet/intranet-based Web page, or any other ActiveX container, and it automatically configures itself to deliver live alarms in a scrollable window. You can easily customize the view via its properties page to control the colors, fonts, columns, rows, alarm filtering, subscriptions, hot-links, etc.

Alarm Report ActiveX

Alarms logged to a database can be a chore to sort through and analyze. The powerful **Historical Alarm Analysis (Report) ActiveX** solves this problem by easily creating filtered reports, pie charts, bar plots, and even exporting to custom Crystal Reports. At the click of a button, you can find out which alarm is occurring most often and see if there are certain "trouble-spots," review downtime, and more.

The Alarm Report ActiveX allows reporting (user-configured or preconfigured) and graphing of alarms. The source of the Alarm data can be live alarms, alarms previously logged by the Alarm Logger, or a combination of both. Because the Alarm Report is an ActiveX, you can drop it into the AlarmWorX Container, within any GraphWorX HMI Display, an HTML Internet/intranet-based Web page, or any other ActiveX container.

Multimedia Server

AlarmWorX Multimedia is a distributed enterprise-wide alarm notification system that delivers real-time alarm information to you wherever you may be through various multimedia "agents," including from e-mail, pager, fax, voice, text-to-speech, phone, and marquees. AlarmWorX Multimedia can easily "Plug and Play" not only with SMAR Alarm and Event Servers but also with other third-party OPC alarming software.

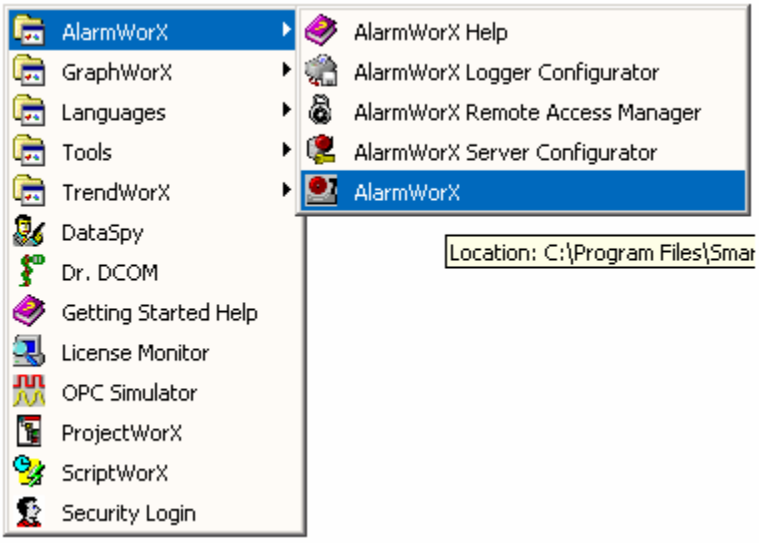
MMX Alarm Server Configurator

Multimedia Configurator takes you through the steps to create alarm notification rules and action sets. There is even a step-by-step animated tutorial to help you configure your system. You can easily apply filters so only specific alarms trigger your multimedia announcements. When an alarm occurs, specify multiple notifications methods (e.g., page the technician, phone the supervisor, and email the QA lab.). You can also send notifications only to on-duty personnel using the built-in scheduling mechanism. Create sophisticated (yet easy-to-build) work schedules with vacation times, re-occurring patterns and more. There's even the concept of "roles" for various personnel.

Starting the AlarmWorX Container

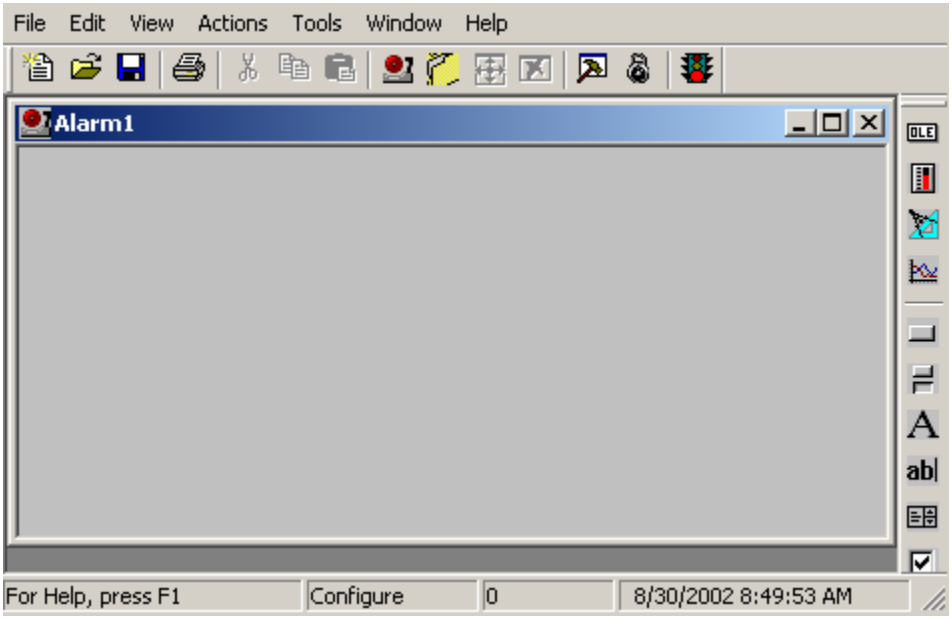
To start the AlarmWorX Container:

1. From the Windows **Start** menu select **Programs > SMAR** ProcessView **> AlarmWorX > AlarmWorX,** as shown in the figure below.



Starting the AlarmWorX Container

2. When you start AlarmWorX, the AaIrmWorX Container screen opens and a window appears, as shown in the figure below. If you do not install an SMAR Software License, you will only be able to run the AlarmWorX Container in a two hour Demo mode. If you have a software license and do not wish to run in Demo mode, make sure that the license is properly installed.



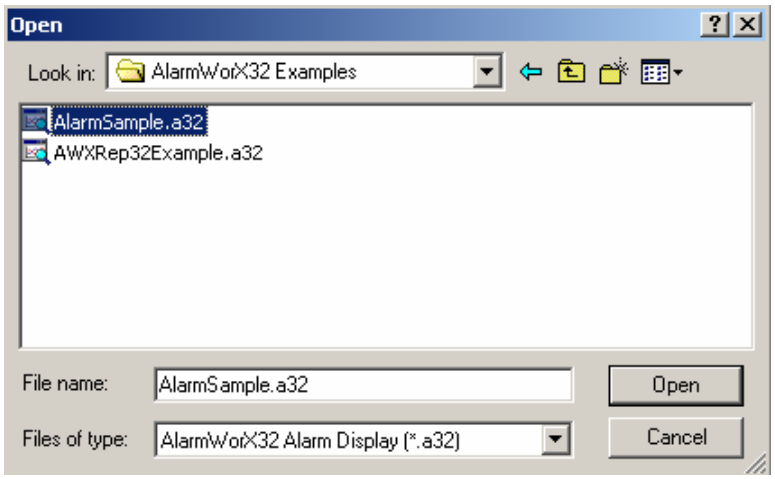
AlarmWorX Container Screen and Alarm Window

The table below lists the basic AlarmWorX Container screen components and their functions. Refer to the **Screen Features** section for a complete description of the menu bar, toolbar, and status bar functions.

Component	*Function*
Title bar	Displays the name of the application and the name of the current screen displayed. To reposition the screen, click the title bar using the left mouse button and drag the screen to the desired location.
Control-menu box	Displays the Windows Control menu. Refer to your Windows documentation for more information about the control menu.
Minimize button	Reduces the window to an icon.
Maximize button	Enlarges the active application window to fill the entire screen.
Menu bar	Contains the various menus through which you can access AlarmWorX Container features, such as printing and saving to a file.
Toolbar	Contains toolbar buttons for certain useful menu items.
Work area	Displays the various AlarmWorX Container screens as you select them.
Status bar	Displays context-sensitive help, display mode, and the current time and date.

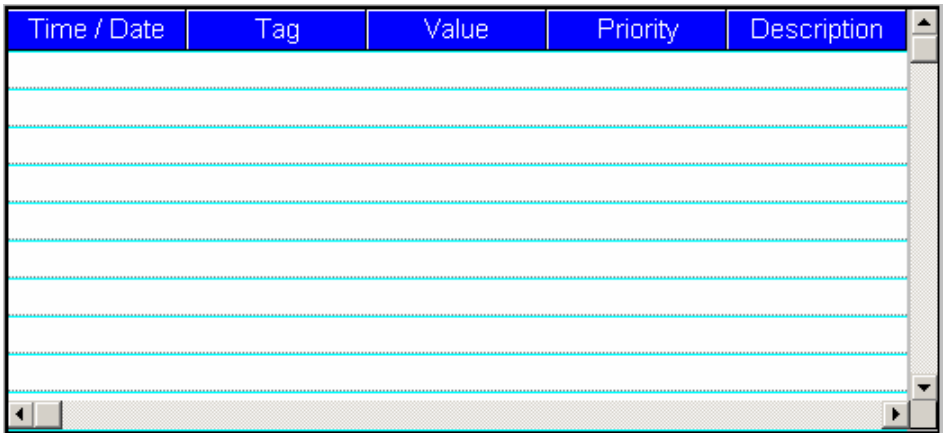
AlarmWorX provides an example alarm configuration. To open this example in the AlarmWorX Container:

Select **Open** from the **File** menu and browse to **...\installed directory** ProcessView **-\Examples\AlarmWorX Examples,** as shown in the figure below. Select the **AlarmSample.a32** file, and then click **Open.**



Opening the Alarm Sample

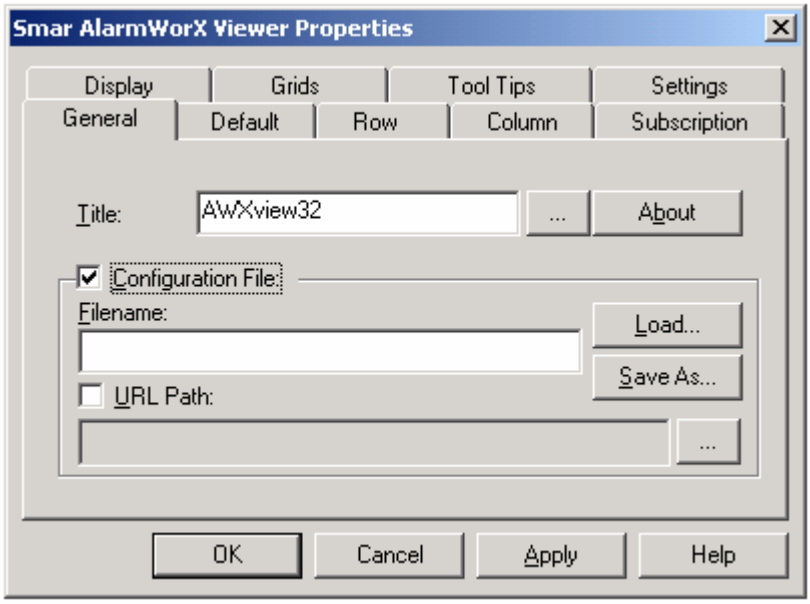
1. This opens a configured Alarm Viewer file, as shown in the figure below.



Sample Alarm Viewer

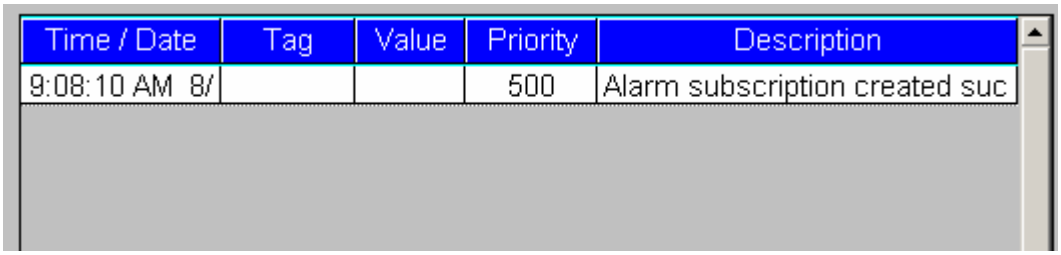
2. To configure the Alarm Viewer, click anywhere in the Alarm Viewer window. This opens the **Alarm Viewer ActiveX Properties** dialog box, as shown in the figure below. Within the Properties dialog, you can configure column and row settings, set filtering, and the alarm-sorting format.

Note: For complete information about the Alarm Viewer configuration, please see the AlarmWorX Viewer ActiveX Help.



Configuring the Alarm Viewer ActiveX

3. In the Alarm Container, select **Runtime Mode** from the **Actions Menu.** The container will enter runtime mode and alarms will start posting in the Alarm Viewer. Based on the configuration settings in the **AlarmSample.a32** file, the Alarm Viewer will start the AlarmWorx Server. The AlarmWorx Server will then start the Simulator OPC Server, which provides simulated OPC data.



Alarm Viewer in Runtime

Additionally, AlarmWorX offers the following functionality in runtime, while right clicking on the display:

When you right-click on the AlarmWorX Viewer ActiveX during runtime mode, the following functions are available:

Alarm acknowledgement: In the Alarm Acknowlegdement dialog box, you can choose from Point, Global, Visible, Filtered or Area acknowlegement.

Sorting: The sorting feature also allows for multilevel sorting of alarm data up to five levels with ascending/descending specific to each level.

ToolTips: Choose from context, help, content, and alarm line ToolTips.

VB event: This option allows a user to trigger an automation event during runtime mode. Using this event requires VBA programming tied to the user event.

Application: This option only appears if the you select the extra attribute associated with it. This attribute is server-specific (for example, when using the Alarm OPC Server, select Default Display. This allows you to launch applications (i.e. *.exe, *.com or *.bat files) by clicking on the corresponding attribute cell.

Display options: This option only appears if the Alarm Viewer creates the display list by checking the extra attributes field for the registered file types. This attribute is server-specific (for example, when using the SMAR Alarm OPC Server, select Default Display). All displays configured for a particular alarm will be displayed. Selecting one, by clicking on the attribute cell, launches the display.

Display Tricks

Introduction

The ability to customize visual information is an important feature of HMI software. Alarm software configuration has increased in its complexity, due to the vast majority of different needs, design tastes corporate standards, and plant processes. This section attempts to simplify some of the layout process and provide some ideas for design consideration.

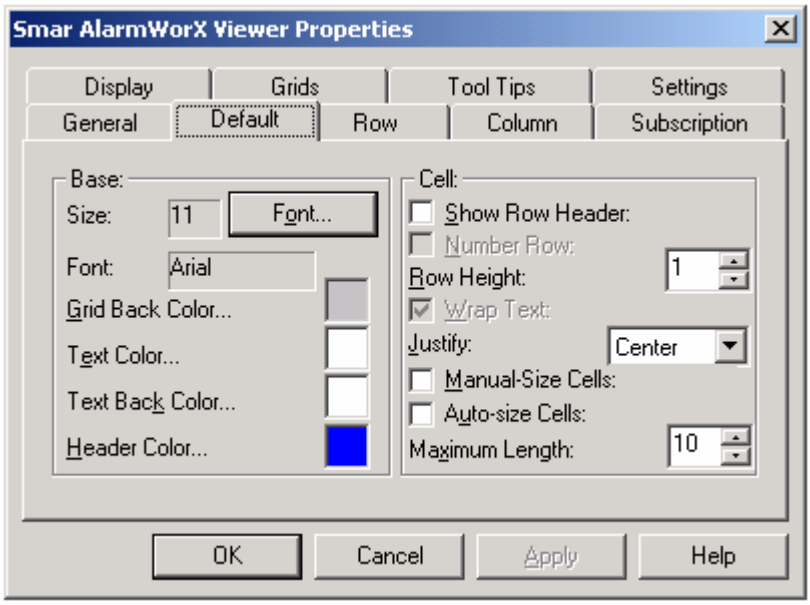
Color

Besides raw data, color is probably the single most important piece of information for an alarm display. As shown in the figure below, the color configuration of the **Alarm Viewer ActiveX Properties** dialog box is based on three levels:

Default

Row

Column

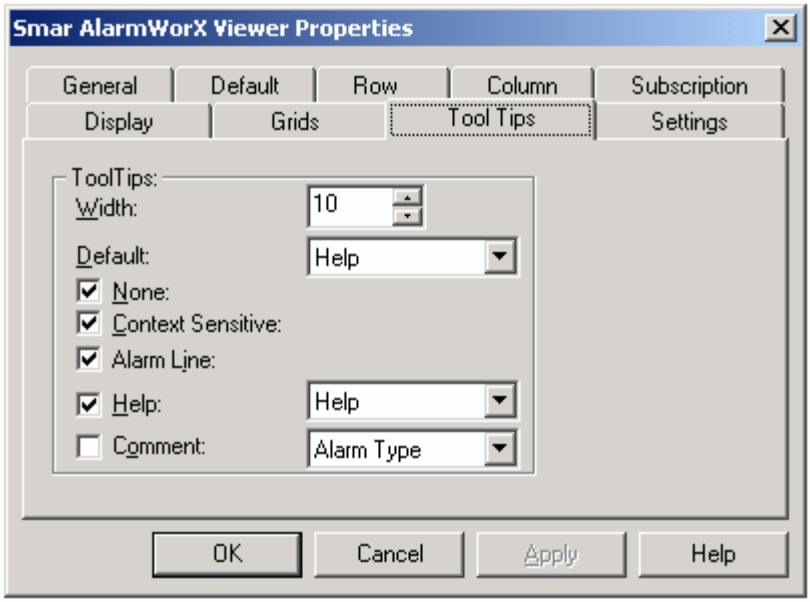


Configuring Colors for the Alarm Viewer ActiveX

A judicious combination of these levels can greatly simplify configuration time. The default settings are applied when a column or row setting is not provided. If a majority of the settings requires a background color of white, set the default background color to white. Row settings are used a majority of the time to provide specific colors for various alarm states. If severity is not important, it is not necessary to have multiple color configurations for severity. On the other hand, multiple color configurations for severity can be used to display sub-conditions. For example, if all High alarms are configured to be severity 700, then a color of purple for severity 700 would only show up for High alarms even though High alarms are a substate of the limit condition. Column settings can be used effectively to provide constant color combinations. This is good a place to set colors for help text or to set a column apart from the rest of the display.

ToolTips

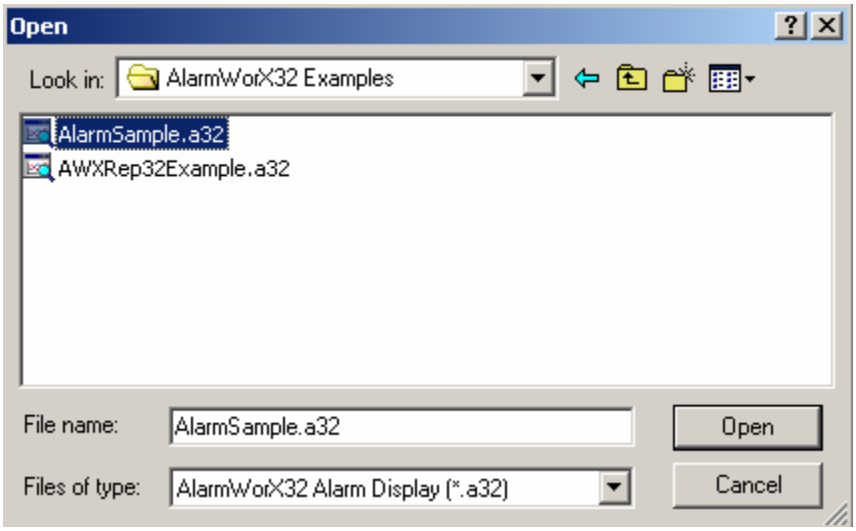
ToolTips are an easy way to provide extra information to the operator without constantly using screen resources. ToolTip configuration in the **Alarm Viewer ActiveX Properties** dialog box involves setting the visual format and the subscription.



Configuring ToolTips for the Alarm Viewer ActiveX

Example

1. Select **Open** from the **File** menu and browse to **...\installed directory** ProcessView **-\Examples\AlarmWorX Examples,** as shown in the figure below. Select the **AlarmSample.a32** file, and then click **Open.**



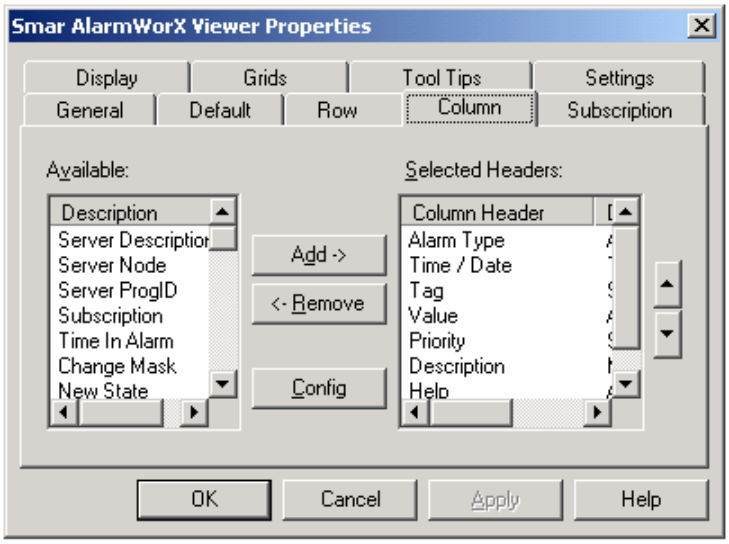
Opening the Alarm Sample

2. This opens a configured Alarm Viewer file, as shown in the figure below.

Sample Alarm Viewer

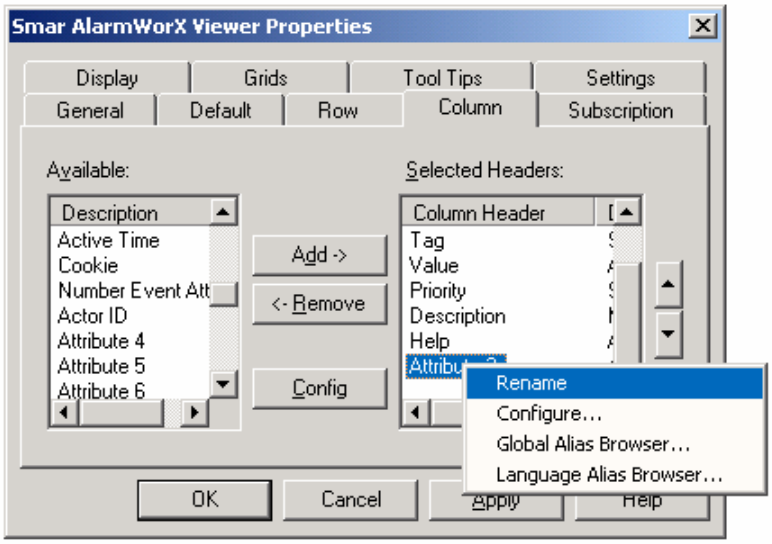
3. To configure the Alarm Viewer, click anywhere in the Alarm Viewer window. This opens the **Alarm Viewer ActiveX Properties** dialog box, as shown in the figure below. Select the **Column** tab.

Note: For complete information about the Alarm Viewer configuration, please see the AlarmWorX Viewer ActiveX Help.



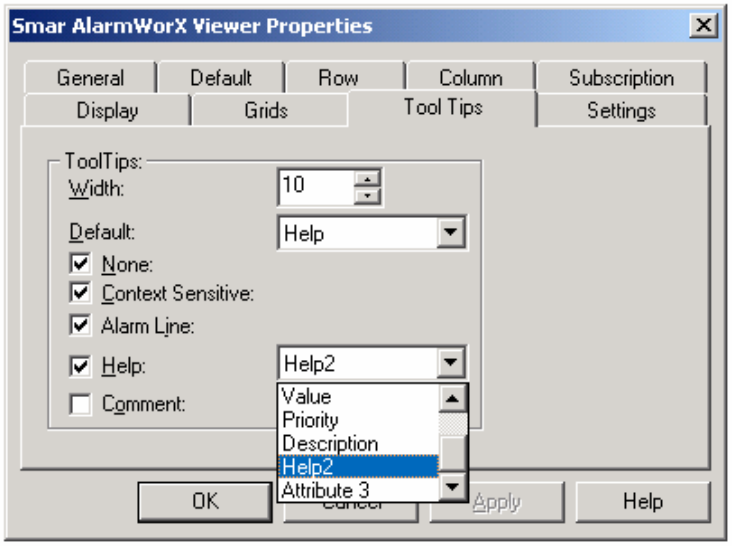
Configuring Columns in the Alarm Viewer ActiveX

4. Scroll down the list of **Available** columns until **Attribute 3** is visible. Select Attribute 3 and click the **Add** button to add it to the **Selected Headers** list. This adds the Attribute 3 to the column list. Right-click on Attribute 3 and select **Rename** from the pop-up menu, as shown in the figure below. Rename Attribute 3 to "Help2."



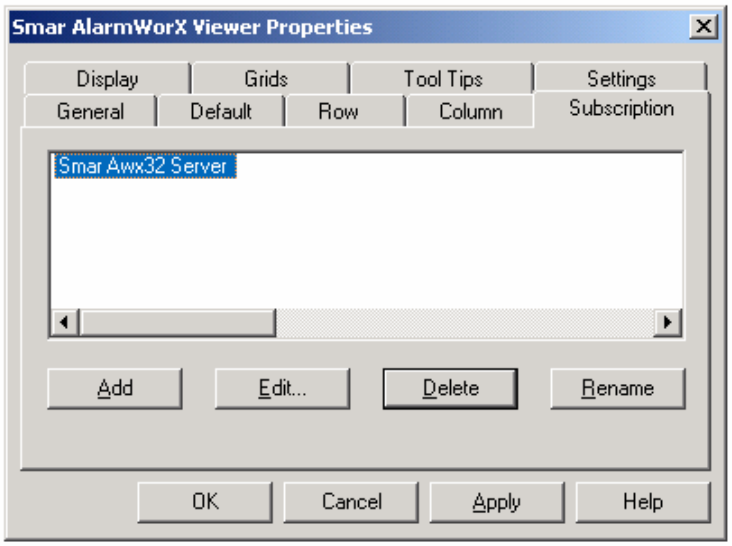
Renaming the Attribute

5. In setting up the visual format quickly, it is faster to configure all of the columns before configuring the rest of the visual settings. To configure these settings go to the **ToolTips** tab. In the **ToolTips** tab, change the associated column for the **Help** ToolTip to the **Help2** column. Do this by selecting **Help2** from the drop down list, as shown in the figure below. The Help2 column is now associated with the **Help** ToolTip by choosing **Comment** in the ToolTip section.



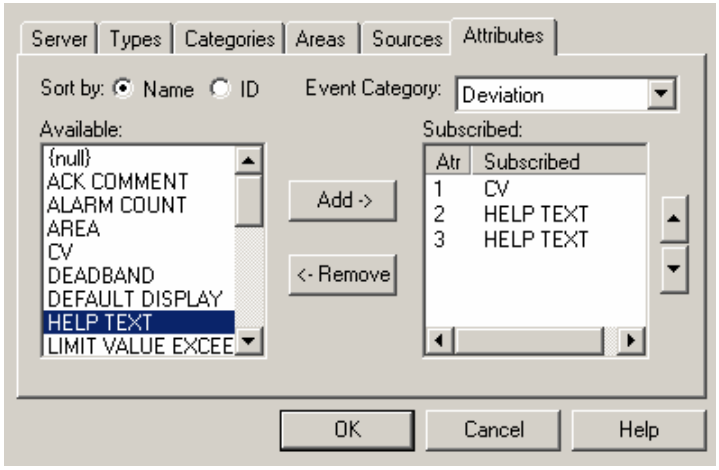
Configuring the Help ToolTip

6. Now that the visual side of things is set up, it is necessary to change the subscription to request the additional help information. Select the **Subscription** tab of the **Alarm Viewer ActiveX Properties** dialog box tab, highlight the SmarAWX Server subscription, and then click the **Edit** button, as shown in the figure below.



Alarm Viewer ActiveX Properties: Subscription Tab

7. This opens the **Event Subscription** dialog. Select the **Attributes** tab, as shown in the figure below, which allows you to add extra attributes to a particular event category within a subscription. As you can see in the figure below, the **Current Value (CV)** and **Help Text** have already been subscribed. Add the **Help Text** extra attribute to the **Subscribed** list by highlighting Help Text under the **Available** list and clicking the **Add** button. Please note that order is important. Since **Current Value (CV)** is currently being used as Attribute 1 and **Help2** is assigned to the Attribute 3 column, the subscription should bring in Help Text to **Atr 3,** as shown in the figure below. Continue this process for the **Limit, Digital,** and **Rate of Change** event categories by selecting the **Event Category** item from the drop-down list and repeating the above steps. Click the **OK** button on the **Event Subscription** dialog, and then the **OK** button on the **Subscription** tab.



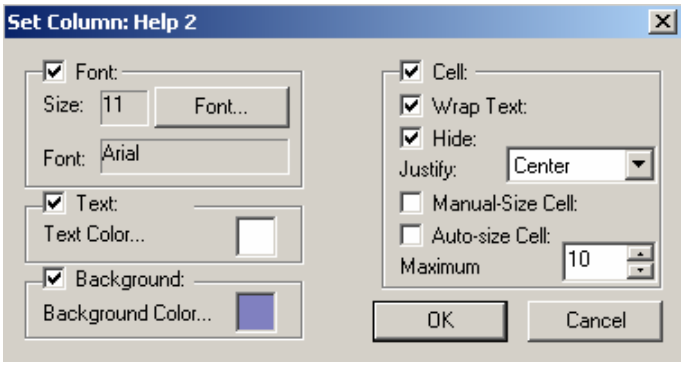
Event Subscription Dialog Box: Attributes Tab

8. Enter runtime mode by selecting **Runtime** from the **Actions** menu.

9. Right-click on any alarm and choose **ToolTips** from the pop-up menu and select **Help.** This changes the ToolTip from context sensitive to help. The ToolTip information will match the information in the **Help** column.

10. As an extra step, it is possible to hide the Help2 column. Exit runtime and open the **Column** tab of the **Alarm Viewer ActiveX Properties** dialog box. Highlight the **Help2** column, and press the **Config** button. This opens the **Set Column** configuration dialog, as shown in the figure below. Enable the Cell override feature by checking the **Cell** check box. Hide the column by checking the **Hide** check box. Click the **OK** button and the **OK** button on the **Column** tab. The help column will no longer be visible. When entering runtime, it will still be possible to receive the help information via the ToolTips. Simply right-click on an alarm line, select **ToolTips** from the pop-up menu, and then select the help ToolTip. The default ToolTip

and ToolTip width will be changed in the ToolTips tab of the **Alarm Viewer ActiveX Properties** dialog box.



Configuring the Column Properties

Miscellaneous

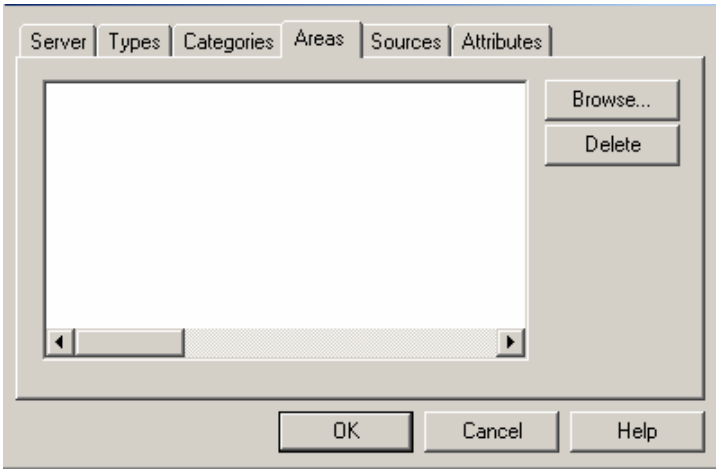
Several features of AlarmView only work in conjunction with other features. For example, the wrap text feature will only be visible if the line width is two or greater. Also, it is not possible to change row widths during runtime if the row header is not enabled. When sizing columns, use the default column size to approximate the best general settings. Then use the column override to individually size any columns not exactly correct.

Data are the most important piece of information displayed by an Alarm Viewer. However, for a display to be truly effective, only pertinent information is desirable. In alarm systems, filtering represents a major piece for weeding out unnecessary data. Using the OPC Alarm and Events Specification, filtering is largely achieved by creating alarm subscriptions with various servers. This effectively creates a server-side filter, improving speed and reducing communication traffic. Rather than go over the information found in the OPC Alarm and Events Specification or the AlarmWorX Viewer ActiveX documentation, several filtering tricks are presented here to provide a few ideas on possible filtering schemes.

Average Filter

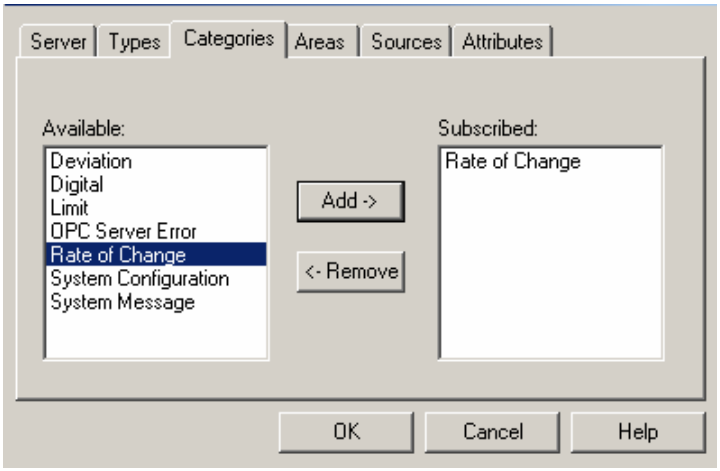
The process of setting up a subscription does more than just enable data to be passed from clients to server; it also creates a server-side filter. Server-side filters have the advantage of reduced communication traffic between the clients and the server, due to the fact that only requested messages are sent. An average filter consists of multiple subscriptions to the same server. An example of this might be a subscription that only requests alarms from **Area1** with a subscription that requests only the **Rate of Change** alarms.

Note: The **Area** can be set using the **Areas** tab in the **Event Subscription** dialog box (under the **Subscription** tab of the **Alarm Viewer ActiveX Properties** dialog box), as shown in the figure below, and clicking **Browse** to find the appropriate area.



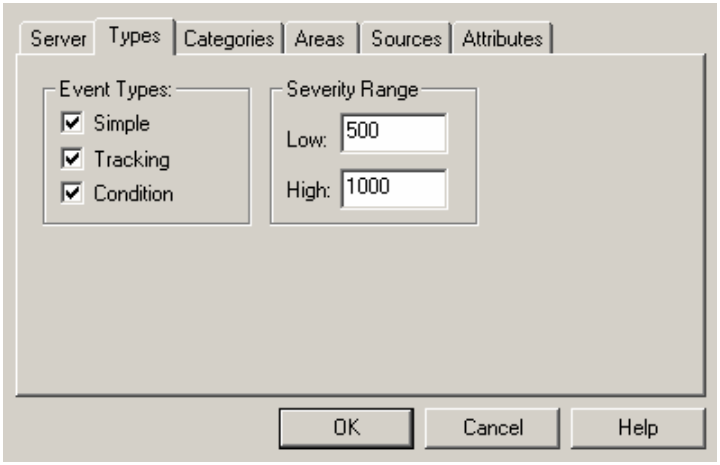
Event Subscription: Areas

Rate of Change is set on the **Categories** tab in the **Event Subscription** dialog box (under the **Subscription** tab of the **Alarm Viewer ActiveX Properties** dialog box), as shown in the figure below, by selecting **Rate of Change** as the event category.



Event Subscription: Categories

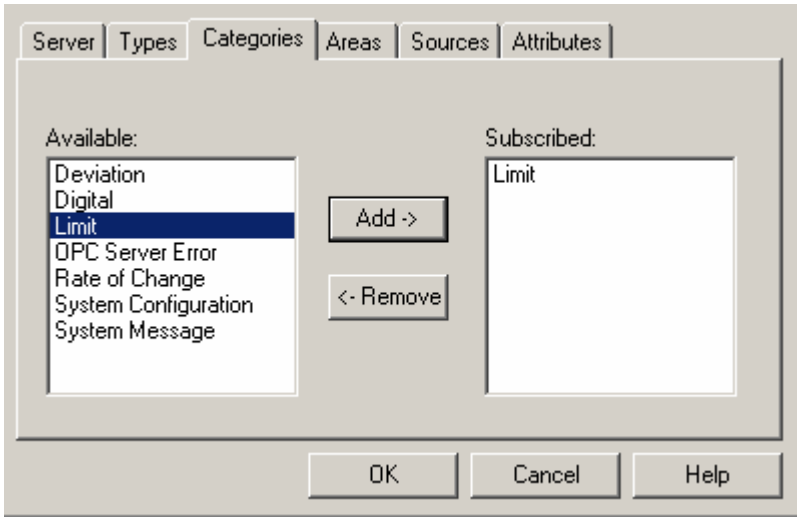
This creates a filter that will send all alarms for Area1 and all Rate of Change alarms. These filters can be further refined by setting severity levels and event types. By setting low severity to 500 and enabling condition events on the **Types** tab, as shown in the figure below, the filter can limit messages to alarms that require acknowledgment and have a severity range of 500 to 1000.



Event Subscription: Types

Filtering on High Alarms

Due to the open architecture of the OPC Alarm and Events Specification and the use of server-side filtering, some of the more specific filtering capabilities are done by client-side filtering. Server-side filtering operates by restricting alarm messages sent to clients. This makes it more efficient than client-side filtering, which operates by hiding alarm messages. It is possible to use only server-side configuration, but this requires filtering to be taken into account when configuring the alarm database. An example of this would be filtering on only high alarms. The first step is to make the limit condition the only requested event category in the **Categories** tab in the **Event Subscription** dialog box (under the **Subscription** tab of the **Alarm Viewer ActiveX Properties** dialog box), as shown in the figure below, by selecting **Limit** as the event category. Highlight the **Limit** selection and click the **Add** button. Limit now shows up in the **Subscribed** list, as shown below. Only limit alarms are requested from the server for this subscription.



Event Subscription: Categories

It is still possible to have other subscriptions to the server that request other alarm categories. To restrict the subscription further requires some configuration work on the server side. It is possible to set alarm severity for all alarm types in the SMAR OPC Alarm and Event Server. By setting alarms to a specific severity range, it is possible to filter subconditions (high, lo, hihi, etc.) by filtering on severity. This method uses the subscription capabilities of the alarm server while taking full advantage of server-side subscription (i.e. no wasted messages).

Using the Mouse and Keyboard

Mouse Functions

In Windows, you use the mouse to move a pointer (usually an arrow) on the screen. The pointer shows you where you are on the screen and enables you to point to and select application items.

In the AlarmWorX Container, you can use the mouse to:

Select icons, buttons, and other screen objects.

Resize AlarmWorX Container screens.

Reposition windows and dialog boxes.

Scroll through list boxes.

Display context-sensitive help in the status bar for screen objects, such as icons, command buttons, and parameter fields.

The table below lists various mouse functions and descriptions with which you need to be familiar.

Function	Description
Left-click	Position the mouse pointer over an object, such as an icon or a command button, and press the left mouse button once.
Right-click	Inside an Alarm window, press the right mouse button once to view ActiveX properties.
Double-click	Position the mouse pointer over an object, and press the left button twice in quick succession.
Drag-and-drop	Click an object, and with the button still depressed, move the object to the desired location and release the button.
Select	Click an object once with the left mouse button, highlighting the object (enclosing the object in a rectangle with a dotted rule or in reverse color).
Move pointer over	Place the mouse pointer on top of an object, such as an icon or a command button, to display context-sensitive help for that object in the status bar.

Shortcut Keys

The keyboard is used to enter information into dialog boxes and to select menu options. The table below lists the available shortcut keys and their related functions (English version only).

Key	Function
ALT+F	Displays the File menu options available for the displayed screen
ALT+H	Displays the available Help menu options
ALT+T	Displays the Tools menu options available for the displayed screen
ALT+W	Displays the Window menu, which contains a list of available AlarmWorX Container screens
ALT+V	Displays the View menu options available for the displayed screen
ALT+A	Displays the Actions menu options available for the displayed screen
ALT+E	Displays the Edit menu options available for the displayed screen
ALT+F8	Starts the Macros dialog
ALT+F11	Starts the Visual Basic editor
CTRL+P	Prints the current screen
CTRL+N	Opens a new Alarm window
CTRL+O	Opens an existing Alarm window
CTRL+S	Saves the currently selected Alarm window
CTRL+T	Displays the Main toolbar
CTRL+U	Displays the status bar
CTRL+F	Sizes the Alarm window to the display
CTRL+G	Tiles all the open Alarm windows in the display
CTRL+H	Cascades all open Alarm windows in the display
CTRL+A	Toggles the current window between runtime mode and configuration mode
CTRL+M	Toggles the entire display between runtime mode and configuration mode
Del	Deletes an object from the display
F12	Inserts a new object in the display
F9	Launches the AlarmWorX Configurator
F4	Displays Properties window for object inserted in the display
F3	Opens the Display Preferences dialog
F2	Opens the Application Preferences dialog
F6	Launches security login in runtime mode
F7	Starts the Security Configurator
F1	Opens the Help topics file

AlarmWorX Container Application

The AlarmWorX ActiveX Container application integrates the following components.

Alarm Logger Configurator

Alarm Viewer ActiveX

Alarm Reporting/Analysis ActiveX

Alarm Reporting/Analysis ActiveX

Alarm Server

Alarm Server Configurator

AlarmWorx Container Application

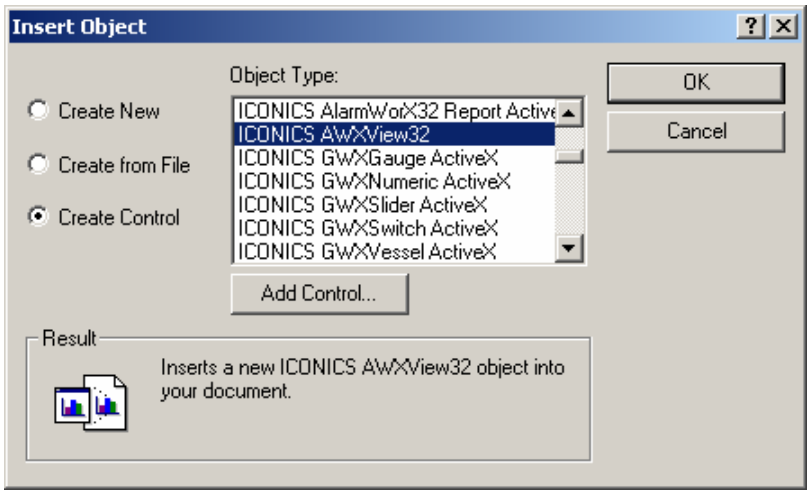
This is a multiple document interface (mdi) container that integrates the various ActiveX alarm components and configuration tools into one user-friendly tool. Menus and toolbar items are provided to allow easy access to all configuration and runtime features of all of the AlarmWorX components. It also adds Microsoft VBA (Visual Basic for Applications) scripting support.

AlarmWorX includes many new features that not only add functionality to the product but also make it easier to use. The AlarmWorX Container now has Unicode support and enhanced international language support, as well as global aliasing support. The Container also includes VBA 6.3 integration.

About the AlarmWorX Container

The AlarmWorX Container is a fully VBA-enabled application, which allows for a high degree of customization and functionality. A container is an application that supports embedding of ActiveX objects, which are available from the **Edit** menu and the **ActiveX** toolbar**.**

To insert an ActiveX object from the **Edit** menu, choose **Insert New Object,** or press the shortcut key **F12.** This opens the **Insert Object** dialog box, which is shown in the figure below. You can select an existing ActiveX object from the list, or you can create a new ActiveX object. You can also open the **Insert Object** dialog box by clicking the **OLE** button on the **ActiveX** toolbar. You can also insert an ActiveX object by choosing from the **Add Trend** submenu in the **Edit** menu.



Insert Object Dialog Box

Menus

This section explains the various features available from the menu bar, toolbar, and status bar that allow you to manage your database records and use AlarmWorX easily and efficiently.

The menus in the AlarmWorX Container enable you to change the default settings for many elements of the container. You can also use the menus to add new trends and open different elements of the AlarmWorX application.

File menu

Edit menu

View menu

Actions menu

Tools menu

Window menu

Help menu

Note: The **File** menu functions vary according to the screen that is displayed. (This is documented where appropriate.)

Status Bar and Toolbar

The status bar and toolbar are objects in the AlarmWorX Container screen. The information contained in the status bar varies depending upon the current screen displayed and the current system configuration and activity. The toolbars provide a convenient way to choose commands that are also available in the menu bar.

Status Bar

The status bar, shown in the figure below, is located at the bottom of the TrendWorX screen. To display or hide the status bar, choose the **Status Bar** command in the **View** menu, or press the shortcut keys **CTRL+B.** The left side of the status bar describes the functions of menu commands as you navigate through each menu. This side also describes the functions of toolbar buttons. When you move the mouse pointer over a toolbar button, the function of the button is displayed in the status bar. The status bar also indicates the display mode (runtime or configure), the number of open ActiveX objects, the current time, and the current date.

Status Bar

Toolbar

The **Main** toolbar is located below the menu bar. As shown in the figure below, the **Main** toolbar contains buttons for different functions available in AlarmWorX.

New: Creates a new trend display.

Open: Opens an existing trend display.

Save: Saves the current display file.

Print: Prints the current trend display.

Cut: Deletes current selection, sending it to the clipboard.

Copy: Copies the current selection to the clipboard.

Paste: Pastes the current contents of the clipboard.

Alarm Viewer: Inserts an Alarm Viewer ActiveX in the display.

Alarm Report: Inserts an Alarm Report ActiveX in the display.

Tile Objects: Fit all open windows into the container screen as non-overlapping tiles.

Delete: Deletes the selected object from the Trend window.

Configurator: Starts the Alarm WorX Server Configurator application.

Security: Launches the Security Server Configurator.

Runtime: Activates runtime mode for all Trend windows.

The **ActiveX** toolbar enables you to select Active X objects. For more information, refer to the **ActiveX Toolbar** section.

ActiveX Toolbar

The **ActiveX** toolbar consists of two main parts. The **OLE** button is used to display the ActiveX Control Selection dialog, while the other buttons represent additional ActiveX controls including:

GraphWorX ActiveX Control

AlarmWorX Viewer ActiveX Control

AlarmWorX Report ActiveX Control

AlarmWorX Indicator ActiveX Control

TrendWorX Viewer ActiveX Control

GraphWorX Gauge ActiveX Control

ActiveX Toolbar

The other buttons represent common ActiveX controls, which are supported by and can be referenced in VBA.

File Menu

The **File** menu commands are listed in the table below.

Note: If an Alarm window is not open, the **Close, Save,** and **Print** commands are disabled.

File Menu Commands

Command	Shortcut Keys	Function
New	CTRL+N	Creates a new alarm display.
Open	CTRL+O	Opens an existing alarm display.
Close		Closes the current alarm display.
Save	CTRL+S	Saves the current display file.
Save As		Saves current display file with a new name or file extension.
Print	CTRL+P	Prints the current alarm display.
Print Preview		Displays a preview of the screen before printing.
Print Setup		Configures printer settings.
Recent File		Lists the last four files opened in AlarmWorX.
Exit		Closes the application.

Printing

Using AlarmWorX, you can perform any of the following printer functions:

Print the current window.

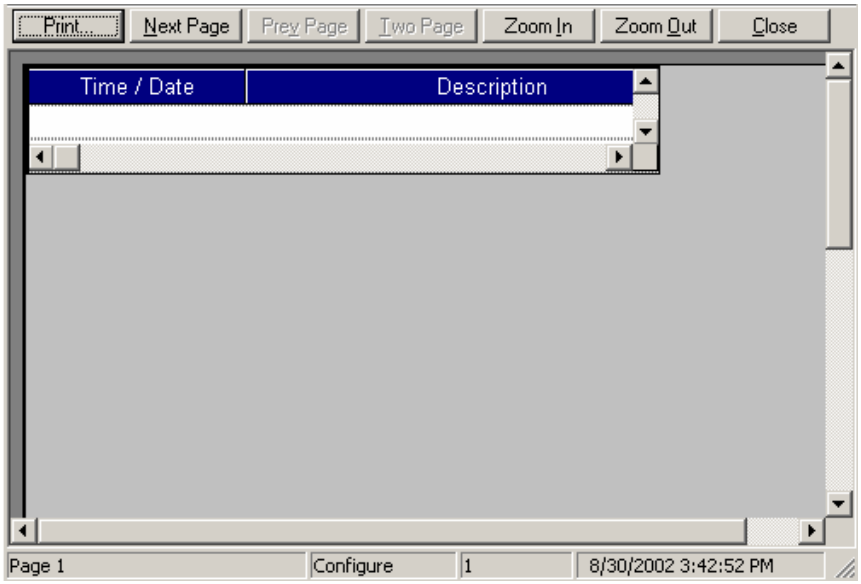
Preview the screen information before printing. Refer to the **Print Preview** section for more information.

Print only the **Help** instructions for the currently selected trend.

To configure a printer, you need to define the appropriate parameters in the Microsoft Windows Control Panel. Refer to your Windows documentation for complete information.

Print Preview

To preview the screen information before printing, choose **Print Preview** from the **File** menu. The **Print Preview** screen will appear as shown below. The figure below shows a print preview of the Alarm window. The title bar indicates the file that is currently displayed.



Print Preview Screen

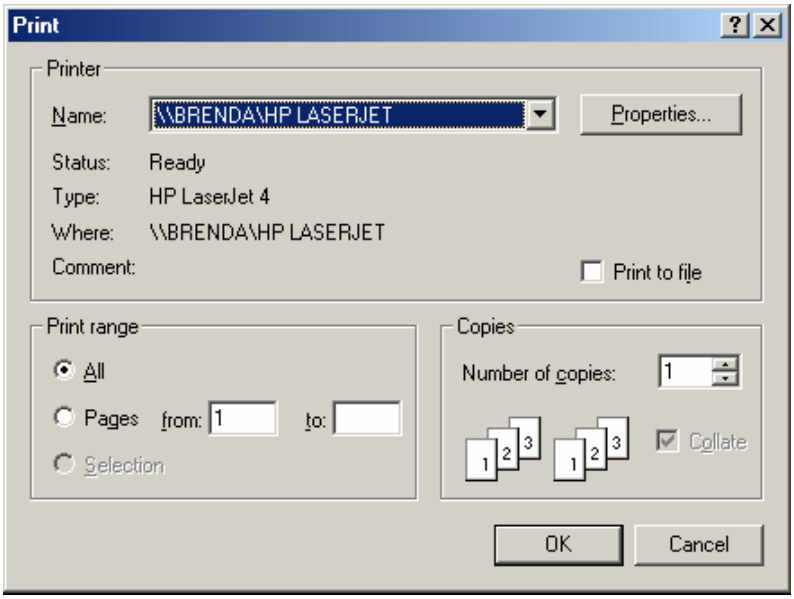
The table below lists the command buttons found in the **Print Preview** screen and their functions. These buttons enable you to view the print preview information before you print.

Button	Function
Print	Displays the Print dialog box
Next Page	Displays the next page in a multiple-page print preview
Previous Page	Displays the page that immediately precedes the current page in a multiple-page print preview
Two Page	Displays two pages simultaneously in a multiple-page print preview
Zoom In	Enlarges the view of the **Print Preview** screen from normal view
Zoom Out	Decreases the view of the **Print Preview** screen to a full-page view, enabling you to see how the entire printed page will look
Close	Exits the **Print Preview** screen and returns to the normal view

To print the document, click **Print** to display the **Print** dialog box. For more information on printing, refer to the **Printing Screen Information** section. If you decide not to print, click **Close** to exit the Print Preview screen.

Printing Screen Information

To print the information on the screen, choose **Print** from the **File** menu, or press the shortcut keys **CTRL+P.** The **Print** dialog box appears as shown below. When you are ready to print, click **OK.** AlarmWorX prints all records contained within the scroll window on the screen.



Print Dialog Box

When the information is sent to the print queue, the **Printing Status** dialog box appears on the screen. The **Printing Status** dialog box indicates the number of records printed and the page that is printing.

The **Print** dialog box indicates the configured printer to which this information prints. Refer to your Windows and printer documentation for complete information about how to configure a printer.

Cancel Printing

To cancel printing, click **Cancel** in the **Printing Status** dialog box. This immediately halts printing, and the print job is removed from the print queue.

Edit Menu

The **Edit** menu commands are listed in the table below.

Edit Menu Commands

Command	Shortcut Keys	Function
Cut	CTRL+X	Cuts the selected object from the current view and places it on the clipboard.
Copy	CTRL+C	Copies the selected object to the clipboard.
Paste	CTRL+V	Pastes the last object placed on the clipboard.
Paste Special		Pastes the last object placed on the clipboard (with special options).
Delete Object	DEL	Deletes the selected object from the Alarm window.
Insert New Object	F12	Opens the **Insert Object** dialog box, which allows you to embed an ActiveX control in the Alarm window.
Links		Edits linked objects.
Properties		Opens the **ActiveX Properties** dialog box.

Inserting Objects

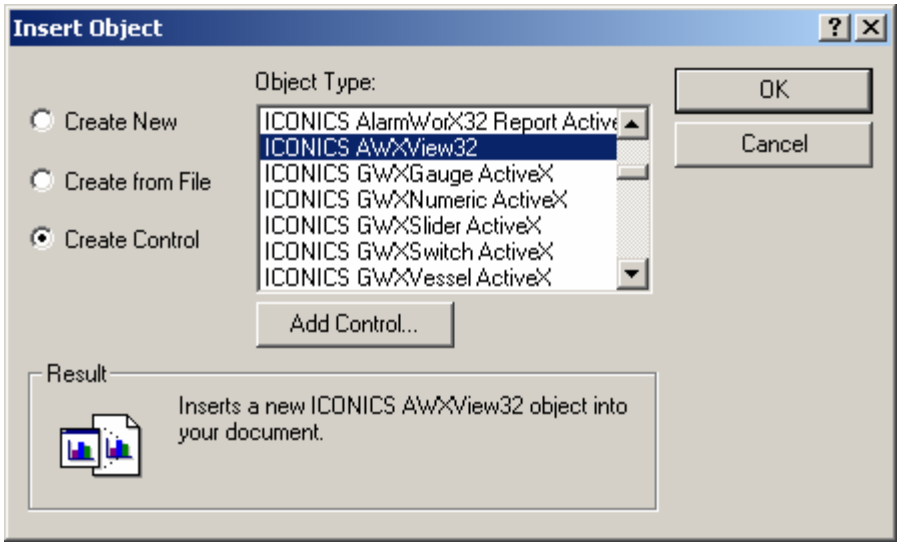
Selecting Insert Object from the Edit menu opens the Insert Object dialog box, shown in the figure below, which allows you to embed an ActiveX control in the container window. Alternatively, integrated ActiveX Controls can be inserted by selecting the corresponding button on the ActiveX toolbar. To configure the properties for an object, either double-click on that object or right-click and select the Properties from the pop-up menu.

The following options are available in the Insert Object dialog box:

Create New: Inserts the selected object into the container. Selecting this tab brings up the following dialog, which offers a list of object types to choose from as shown below:

Create From File: Inserts a user-specified object into the container that is created from an existing file. Click the **Browse** button to select a file.

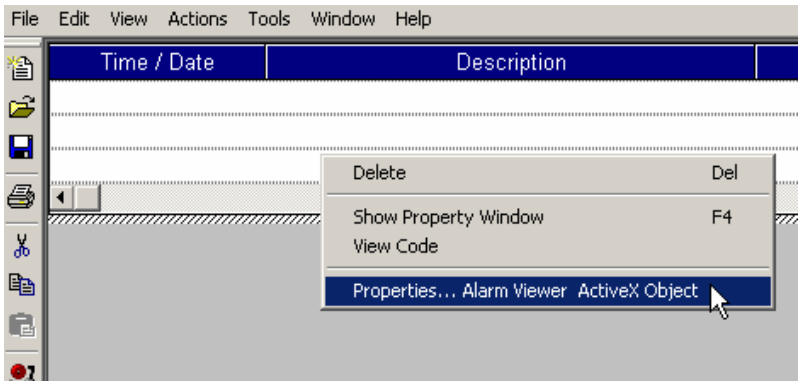
Create Control: Adds an ActiveX control to the **Object Type** list. Click the **Add Control** button to browse for a file.



Inserting an Object Into the Container

ActiveX Object Pop-up Menu

Once the object of choice is inserted in the container, right-clicking on the object displays a pop-up menu, as shown in the figure below.



ActiveX Object Menu

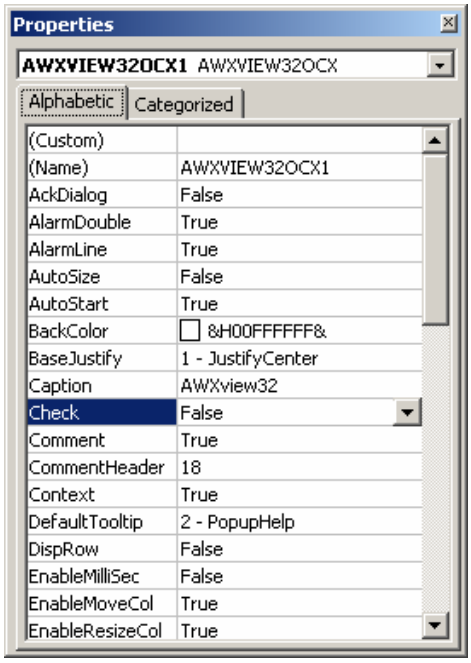
Delete

Selecting **Delete** from the pop-up menu simply deletes the object from the display. Click **Yes** to delete the object, as shown in the figure below.

Warning

Show Property Window

Selecting **Show Property Window** from the pop-up menu displays the Properties relevant to the object, as shown in the figure below.



Properties Window

This window displays, in alphabetic or categorized form, all the properties applicable to the objects within the container. The **Properties** window contains all configurable options for the selected window, whether it is the ActiveX object or the ActiveX Control or the entire display.

You can switch from window to window or from window to display by either clicking on the desired area that displays the **Properties** window or choosing it from the drop-down list at the top of the **Properties** window. To edit an option in the **Properties** window, click on that field and either use the available drop-down list or simply type in your changes. These properties can be also be modified using another the **Properties** dialog displayed by selecting **ActiveX Object/Properties** from the **Edit** menu. This item is also accessible through the **Edit** menu, which comes up if you right-click on the appropriate window.

View Code

Selecting **View Code** from the pop-up menu opens the Microsoft Visual Basic Editor as shown below, which allows you to both view and edit the code pertaining to the object.

ActiveX Object Properties Dialog

Selecting **Properties** from the pop-up menu opens the Properties dialog box for the specific ActiveX object. This menu item (specifically displaying the name of the ActiveX object inserted) also becomes available in the **Edit** menu once an object is inserted in the Container. Note that certain ActiveX properties can only be configured from the ActiveX Properties dialog box.

Note: For information about Properties for a specific ActiveX object, please see the Help documentation for that object.

View Menu

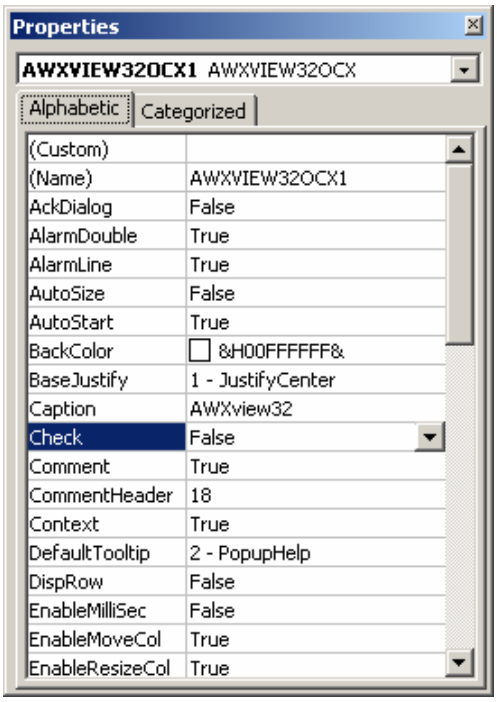
The **View** menu commands are listed in the table below.

View Menu Commands

Command	Shortcut Keys	Function
Properties Window	F4	Opens the **Properties** window, which shows alphabetical and categorical properties for the currently selected ActiveX object.
Display Preferences	F3	Opens the **Display Preferences** dialog.
Application Preferences	F2	Opens the **Application Preferences** dialog.
Main Toolbar	CTRL+T	Toggles the AlarmWorX Main toolbar.
ActiveX Toolbar	CTRL+Y	Toggles the ActiveX toolbar.
Status Bar	CTRL+U	Toggles the status bar, which indicates the status of the container, which mode you are in (configuration or runtime), and the date and time. When navigating through the menu items, whichever item the mouse is over will be displayed in the status bar.
Object Layout		Controls the positioning of currently selected ActiveX objects.
Size to Display	CTRL+F	Maximizes the size of the currently selected ActiveX object within the open Trend window.
Tile to Display	CTRL+G	Changes the size of all ActiveX objects to fit them evenly into the Trend window.
Cascade	CTRL+H	Overlaps all of the open ActiveX objects.
Grid	CTRL+SHIFT+G	Toggles the grids available in configuration mode.
Select Language	CTRL+ALT+U	Specifies the language to be used in the from the **Select Language** dialog box. Select the language you wish to use for your system and click **OK.** For navigation purposes, use the radio buttons and check boxes in the **List** section.

Properties Window

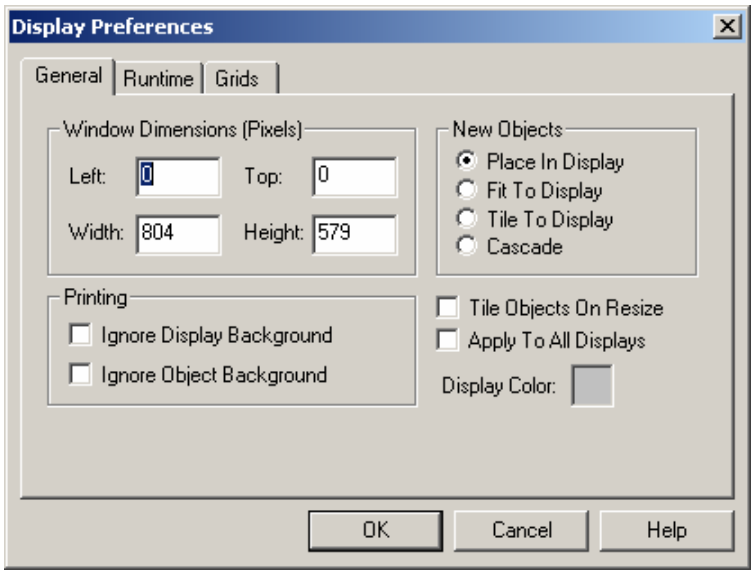
Selecting **Properties Window** from the **View** menu displays alphabetical and categorical properties for the currently selected object, as shown in the figure below. This feature is discussed in the **ActiveX Object Pop-up Menu** section.



Properties Window

Display Preferences

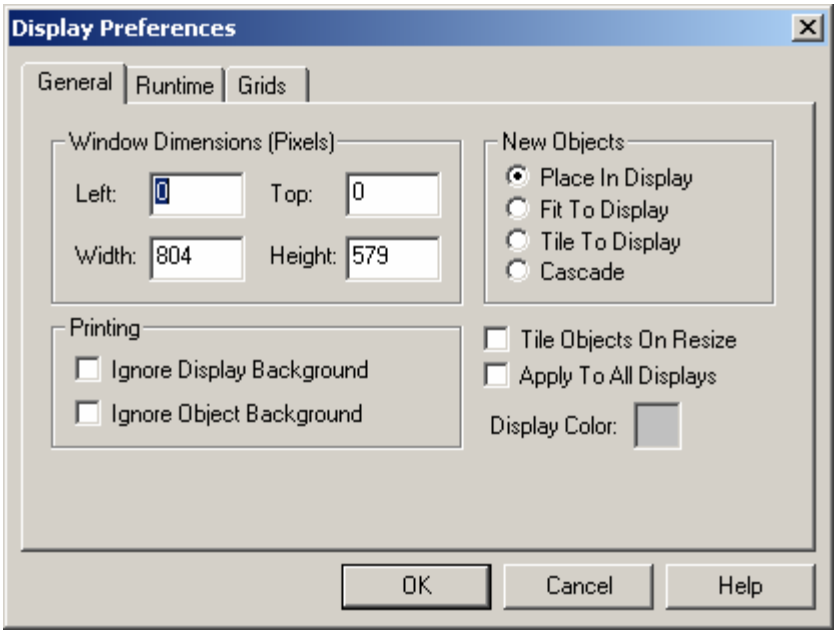
Selecting **Display Preferences** from the **View** menu opens the **Display Preferences** dialog box, as shown in the figure below. This dialog allows you to configure or change the appearance of the Alarm Container display.



Display Preferences Dialog

General Tab

The **General** tab of the **Display Preferences** dialog box, shown in the figure below, sets the size of the display window, configures the arrangement of open windows, changes the display color, and configures the display for printing.



Display Preferences: General Tab

Window Dimensions

The **Window Dimensions** field specifies dimensions (in pixels) from the left and the top of the window, as well as the width and the height of the window.

New Objects

The **New Objects** section positions the object with respect to the display. You can place the object in the display, size the object to the display, tile the object to the display, or arrange the object in the cascade mode.

Printing

Under the **Printing** section, you can choose to ignore the display background and/or ignore the object background while printing. Ignoring the background saves ink while printing displays.

If **Ignore Display Background** is checked upon printing a display, the background color of the entire display will be temporarily changed to white. The original display background color will be restored immediately after printing. If

Ignore Object Background is checked upon printing a display, all background colors of each individual area within an ActiveX Viewer will be temporarily changed to white. The original colors will be restored immediately after printing.

Apply to All Displays

If checked, the parameters defined in the **General** tab of the **Display Preferences** dialog box will be applied to all displays.

Tile Objects on Resize

If checked, objects in the display are automatically tiled when the display is resized.

Display Color

The **Display Color** field allows you to choose a color for the display. Click the color box to open the Color Palette.

Runtime Tab

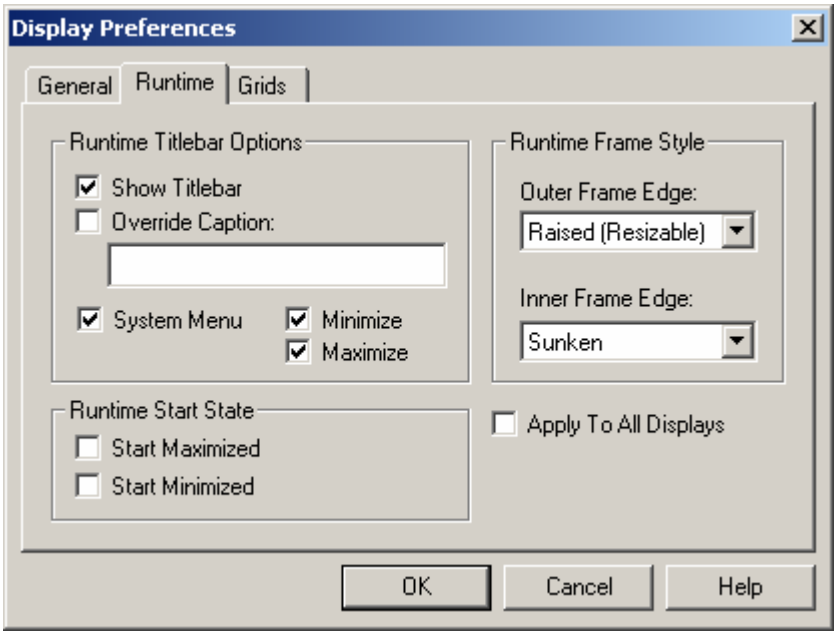
The **Runtime** tab in the **Display Preferences** dialog box, shown in the figure below, configures the way the window will appear in runtime mode. As you can see, the **Runtime** tab contains the following features:

Runtime title bar options

Runtime frame style

Runtime start state

Note: Checking the **Apply To All Displays** check box applies the settings to all currently open displays.



Display Preferences: Runtime Tab

Runtime Title Bar Options

If the **Show Title Bar** box is checked, the title bar of the window will be displayed during runtime mode. Similarly, if the **Override Caption** box is checked, you may enter a caption that you would like to appear in the title bar during runtime.

The **System Menu, Minimize,** and **Maximize** options all refer to buttons that may appear in the title bar during runtime. When all of these boxes are checked, all of the indicated buttons show up in the title bar. If you do not want a button to appear in the title bar, simply click the box that applies to that button to remove the check mark. Hiding these buttons helps to ensure the functionality of the window during runtime mode because the operator can neither close nor change the size of the window.

Runtime Frame Style

The **Outer Frame Edge** drop-down list enables you to choose from the following three frame styles:

None

Raised (resizable)

Raised (fixed size)

Selecting the **Raised (Fixed Size)** option helps to maintain the functionality of the window in runtime mode because the operator is not allowed to change the configured display.

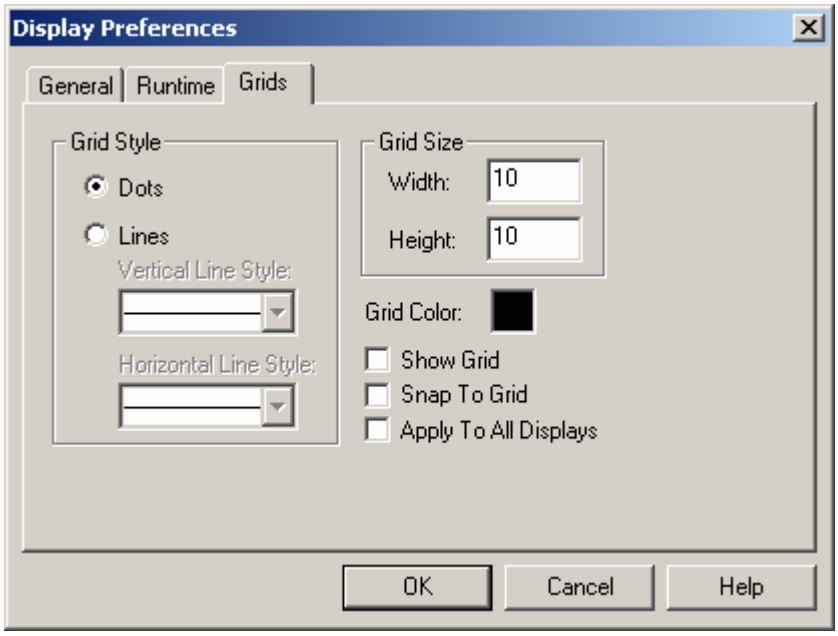
The **Inner Frame Edge** drop-down list gives you the option to have a sunken inner frame edge.

Runtime Start State Section

The **Runtime Start State** feature enables you to choose how the window will appear during runtime mode. Check the appropriate box to minimize or maximize the window.

Grids Tab

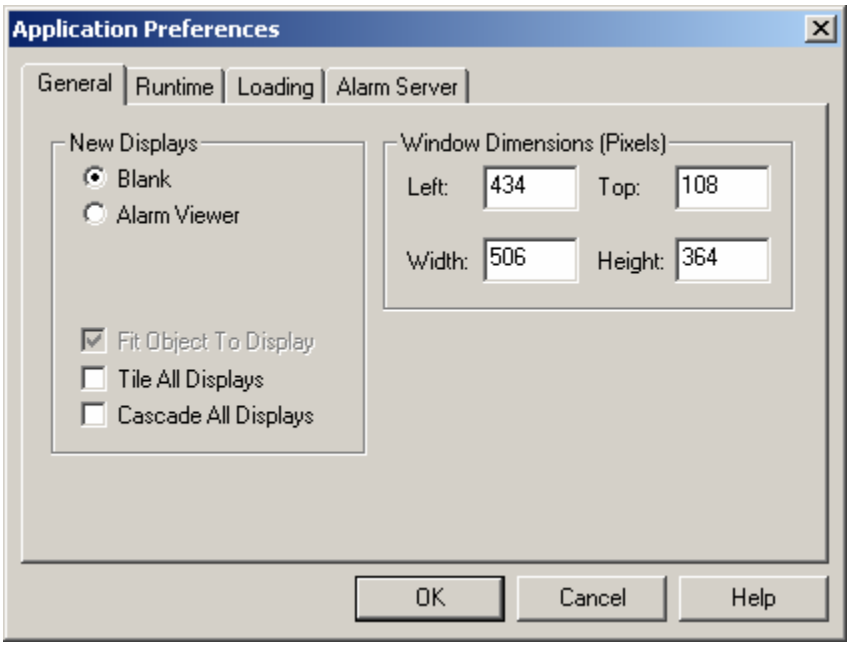
The **Grids** tab in the **Display Preferences** dialog box, shown in the figure below, configures the type, style, size, and color of the display grid. Selecting **Show Grid** makes the grid visible. Selecting **Snap To Grid** makes all borders of the display objects align with the grid lines when they are moved across the display area. The grids are not available when the display is in animation mode.



Display Preferences: Grids Tab

Application Preferences

To configure or change the application preferences for the container, select **Application Preferences** from the **View** menu, or press the shortcut key **F2.** This opens the **Application Preferences** dialog box, as shown in the figure below.



Application Preferences Dialog Box

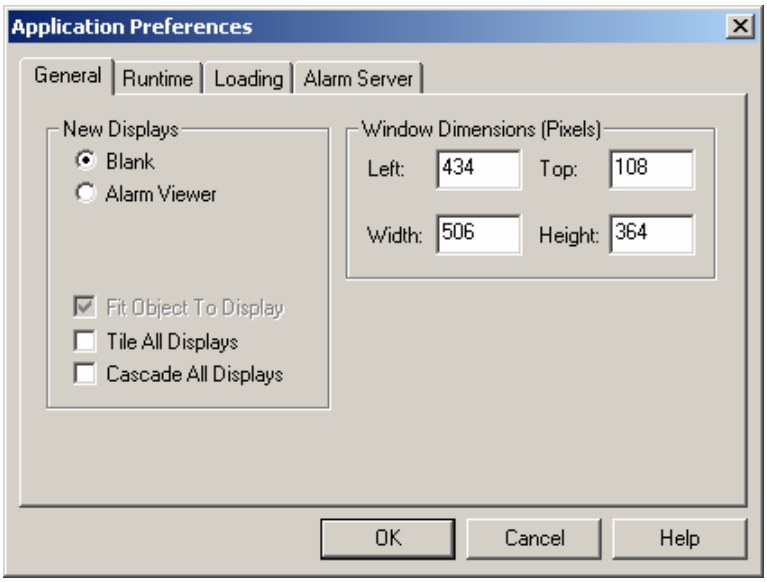
General Tab

The **General** tab in the **Application Preferences** dialog box, shown in the figure below, enables you to

Configure new displays.

Define how a new Alarm Viewer will be placed in the display.

Define the size of the window.



Application Preferences: General Tab

New Displays

You can choose to have the new display by default appear either as a **Blank** window or as a window with an embedded Alarm Viewer.

Checking **Fit Object to Display** maximizes the size of the object in the container window.

Checking **Tile All Displays** changes the size of your objects to fit them into the evenly into the display window. This is helpful if you want to compare data in different objects or if you are moving back in forth from object to object.

Checking **Cascade All Displays** resizes all of the open objects and overlaps them so that you can see the top and left side of every open object window.

Window Dimensions

The **Window Dimensions** field specifies dimensions (in pixels) from the left and the top of the window, as well as the width and the height of the window.

Runtime Tab

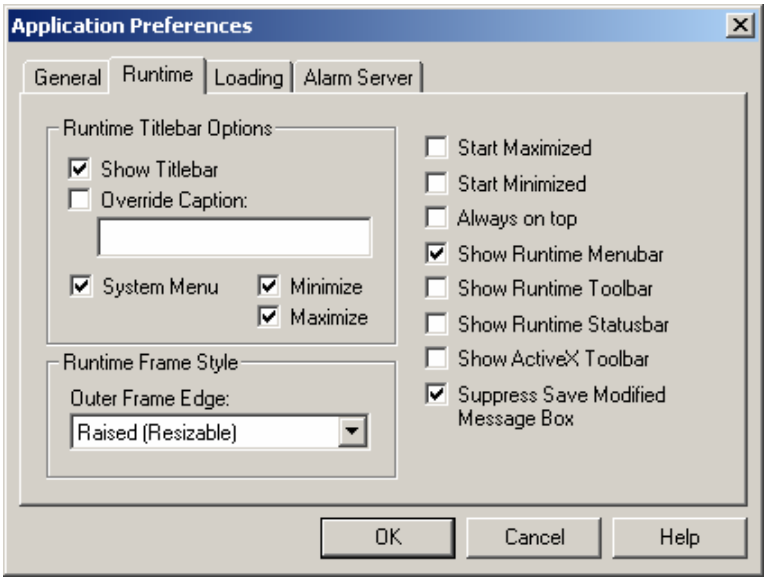
The **Runtime** tab in the **Application Preferences** dialog box, shown in the figure below, configures runtime mode options for the entire AlarmWorX application. As you can see, the **Runtime** tab contains the following features:

Runtime title bar options

Runtime frame style

Runtime settings

The right side options determine how the application will start in runtime and how you want the application to appear in runtime mode. Additionally, the last two options let the you decide if you want to view the ActiveX Toolbar (described later) and if you want the save changes dialog to appear when you make changes in runtime and then exit the application. If the **Suppress Save Modified Message Box** check box is checked, you will not be warned to save all changes made to a display while in runtime mode, and these changes will be lost.



Application Preferences: Runtime Tab

Runtime Title Bar Options

If the **Show Title Bar** box is checked, the title bar of the window will be displayed during runtime mode. Similarly, if the **Override Caption** box is checked, you may enter a caption that you would like to appear in the title bar during runtime.

The **System Menu, Minimize,** and **Maximize** options all refer to buttons that may appear in the title bar during runtime. When all of these boxes are checked, all of the indicated buttons show up in the title bar. If you do not want a button to appear in the title bar, simply click the box that applies to that button to remove the check mark. Hiding these buttons helps to ensure the functionality of the window during runtime mode because the operator can neither close nor change the size of the window.

Runtime Frame Style

The **Outer Frame Edge** drop-down list enables you to choose from the following three frame styles:

None

Raised (resizable)

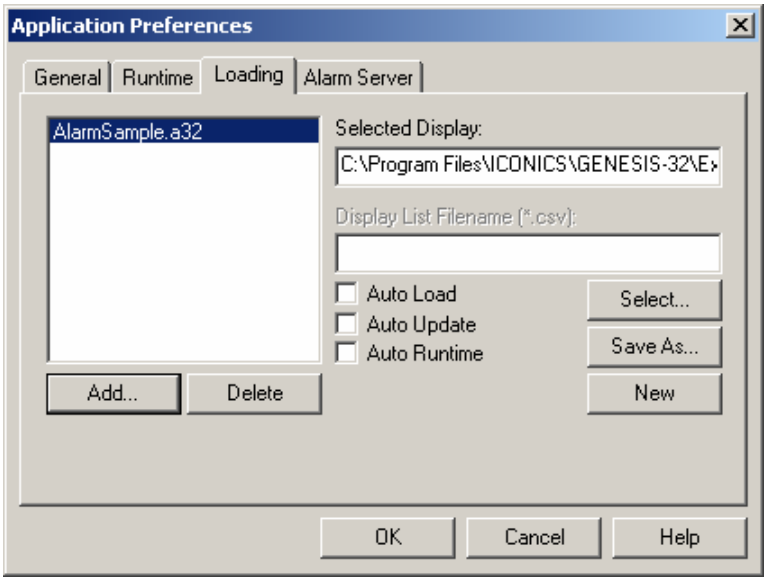
Raised (fixed size)

Selecting the **Raised (Fixed Size)** option helps to maintain the functionality of the window in runtime mode because the operator is not allowed to change the configured display.

Loading Tab

The **Loading** tab in the **Application Preferences** dialog box, shown in the figure below, enables you to add or delete previously created displays during startup. If **Auto Load** is checked, the selected displays will be loaded upon startup of AlarmWorX. If **Auto Update** is checked, AlarmWorX will automatically add the existing displays to the list of displays to be loaded during the next startup. If **Auto Runtime** is checked, the selected displays will automatically start in runtime mode upon startup.

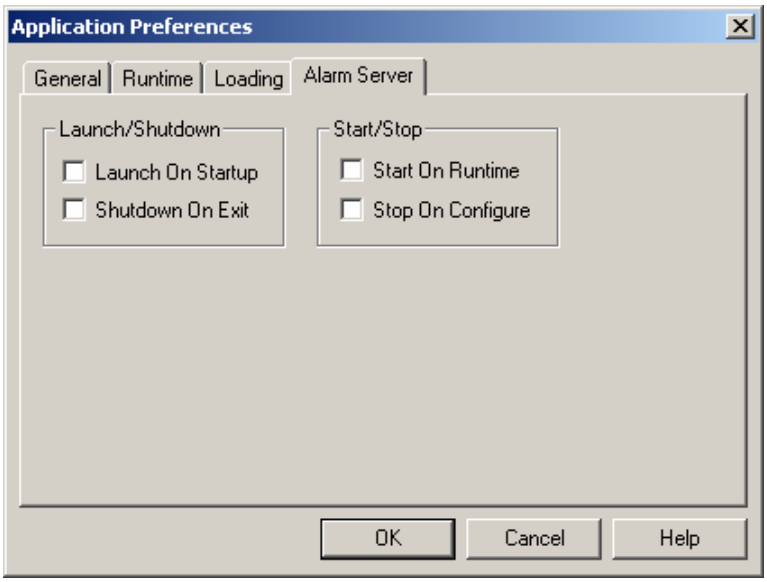
You can also select displays to add to the display startup list by simply clicking **Add,** which opens a **Display** dialog box. Similarly, you can delete a display from the startup list by selecting it and then clicking **Delete.** For this feature to go into effect, you must first save the display startup list as a .csv file. You can do this by clicking **Save As** to choose a directory for the .csv file that contains all the names of the AlarmWorX displays to be loaded upon startup. In addition, you can click **Select** to select a previously saved .csv file with the names of displays to be loaded the next time AlarmWorX starts up.



Application Preferences: Loading Tab

Alarm Server Tab

The **Alarm Server** tab in the **Application Preferences** dialog box, shown in the figure below, configures the behavior of the SMAR Alarm and Events Server.



Application Preferences: Alarm Server Tab

The server behaves according to the following selections:

Launch on Startup: Launches the alarm and events server upon startup of the AlarmWorX Container application.

Shutdown on Exit: Attempts to shut down the alarm and event server upon the shut down of the container. Other applications may still keep the server running.

Start on Runtime: Starts the alarm and events server when the alarm container enters runtime.

Stop on Configure: Attempts to shut down the alarm and event server when the alarm container exits runtime. Other applications may still keep the server running.

Object Layout

To define how current objects in your display are shown, select **Object Layout** from the **View** menu and choose one of the following options:

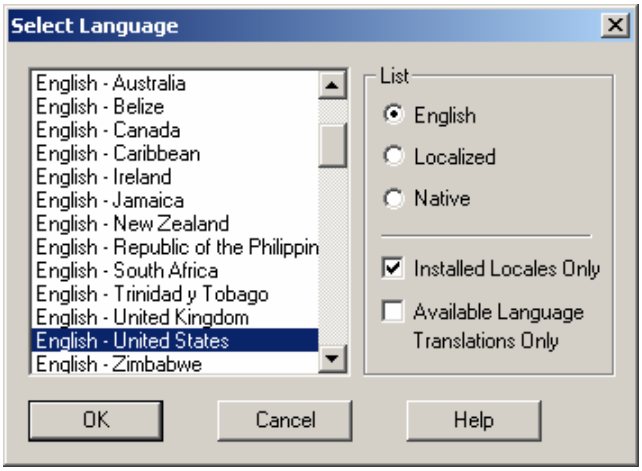
Size to Display: maximizes the size of the object in the container window. This item is not available if no object is selected.

Tile to Display: changes the size of your objects to fit them into the evenly into the display window. This is helpful if you want to compare data in different objects or if you are moving back in forth from object to object.

Cascade: resizes all of the open objects and overlaps them so that you can see the top and left side of every open object window.

Selecting Languages

The **Select Language** function on the **View** menu allows you to choose which language to use in your display. Choosing **Select Language** from the **View** menu opens the **Select Language** dialog box, shown in the figure below.



Select Language Dialog Box

Define the parameters listed in the table below. Then click **OK** to return to the work area.

Select Language Parameters

Parameter	*Description*
List	Lists available languages. Depending on which item you have selected, the view on the left will change. If **English** is checked, the languages will appear as their English name. If **Localized** is checked, the languages will appear with the native country in parentheses (for languages with several dialects only). When **Native** is checked, the languages are displayed the way they would be written in that language.
Installed Locales Only	If this is checked, local languages appear in the box.
Available Language Translations Only	Checking this box allows you to choose from available language translations only.

Actions Menu

The **Actions** menu commands are listed in the table below.

Actions Menu Commands

Command	*Shortcut Keys*	*Function*
Animation Mode	CTRL+A	Animates or deanimates the active Alarm window in the display.
Runtime Mode	CTRL+U	Activates runtime mode for all Alarm windows.

Note: You can also toggle between configuration mode and runtime mode by using the **Traffic Light** button on the **Main** toolbar. When the light is showing Red, the application is in configuration mode. When the light is showing Green, the application is in runtime mode.

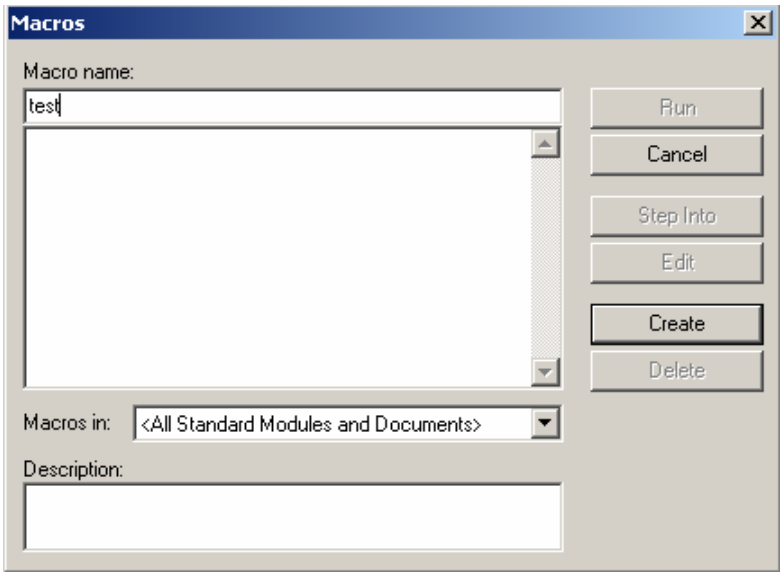
Tools Menu

The **Tools** menu commands are listed in the table below.

Tools Menu Commands

Command	Shortcut Keys	Function
Macros	ALT+F8	Runs a macro using the **Macros** dialog box.
Visual Basic Editor	ALT+F11	Opens the Visual Basic for Applications (VBA) IDE environment for developing customized VBA modules.
Launch Configurator	F9	Starts the AlarmWorX Server Configurator application, which has all the tools required for configuring the Alarm Server.
Logger Configurator		Starts the AlarmWorX Logger Configurator application, the tools required for configuring alarm logging and provides a comprehensive set of tools for monitoring and troubleshooting.
Security Login	F6	Opens the security login screen for logging into the Security Server (runtime mode only).
Security Configuration	F7	Launches the Security Server Configurator (configuration mode only).
Set Working Directory	F8	Specifies a custom directory in which all application configuration files will be stored and retrieved.
Publish to HTML		Launches the Web Publishing Wizard, which allows you to export (generate) an HTML file based on your TrendWorX display file and/or publish the HTML file to a Web server. For more information, please see the Web Publishing Wizard Help documentation.
Configure for Windows CE		Starts AlarmWorX CE configuration mode.
Windows CE Preferences		Configures settings for downloading the configuration to a Pocket PC or CE device.

Selecting **Tools > Macros > Macros** opens the **Macros** dialog box, as shown in the figure below. Type a name for the macro and then click the **Create** button. This opens the Microsoft Visual Basic Editor, where you can create a new macro. You can run an existing macro by entering the name of the macro in the **Macro Name** field and clicking the **Run** button.

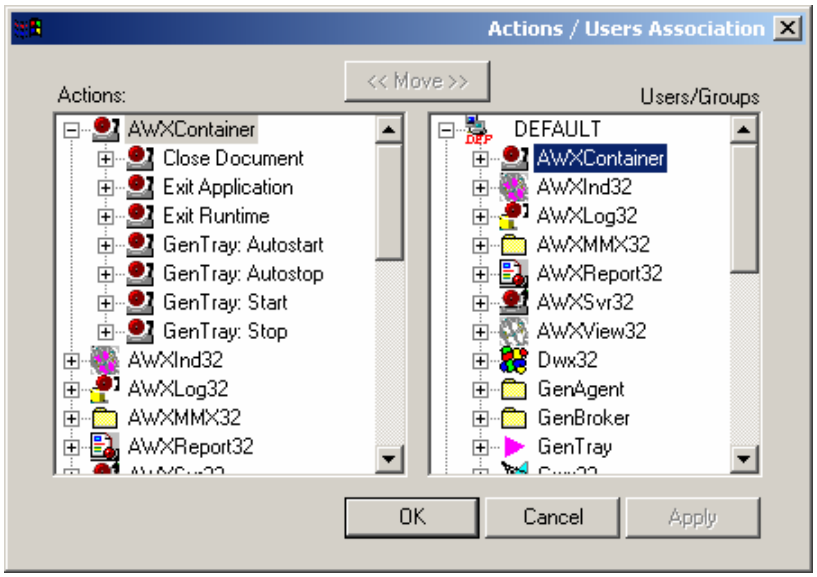


Creating and Running Macros

The **Windows CE** submenu refers to the capability of configuring Pocket AlarmWorX displays to be downloaded to the CE device. To start AlarmWorX CE configuration mode, choose **Configure for Windows CE** from the **Windows CE** submenu. The Windows CE options are not available if Pocket AlarmWorX is not installed on your PC. The CE features are further explained in the Pocket AlarmWorX documentation.

AlarmWorX Security

AlarmWorX has an interface with the Security Server and currently supports the security actions shown in the dialog box below.



Security Server

If you do not have the appropriate security actions for the functions you want to perform, an error message box will appear indicating that you do not have the security level required by the action.

Window Menu

The **Window** menu commands are listed in the table below.

Window Menu Commands

Command	*Shortcut Keys*	*Function*
Close		Closes the active Alarm window.
Close All		Closes all open Alarm windows.
Cascade		Overlaps all open Alarm windows.
Tile		Changes the size of all open Alarm windows to fit them evenly into the Container screen as non-overlapping tiles. This is helpful if you want to compare the data in different Alarm windows or move between Alarm windows.
Arrange Icons		Arranges icons at the bottom of the window.

The **Window** menu also contains a list of all open **Alarm** windows. In this list, the active window is indicated by a check mark. You can display a window by selecting it from this list.

Help Menu

The **Help** menu commands are listed in the table below.

Help Menu Commands

Command	*Shortcut Keys*	*Function*
Help Topics	F1	Launches the online help for AlarmWorX.
About Application		Launches the **About Box,** which contains information about the product version number, copyright, and available disk space. It also contains information about how to contact SMAR.

Downloading ProcessView Configuration Files to Your Pocket PC

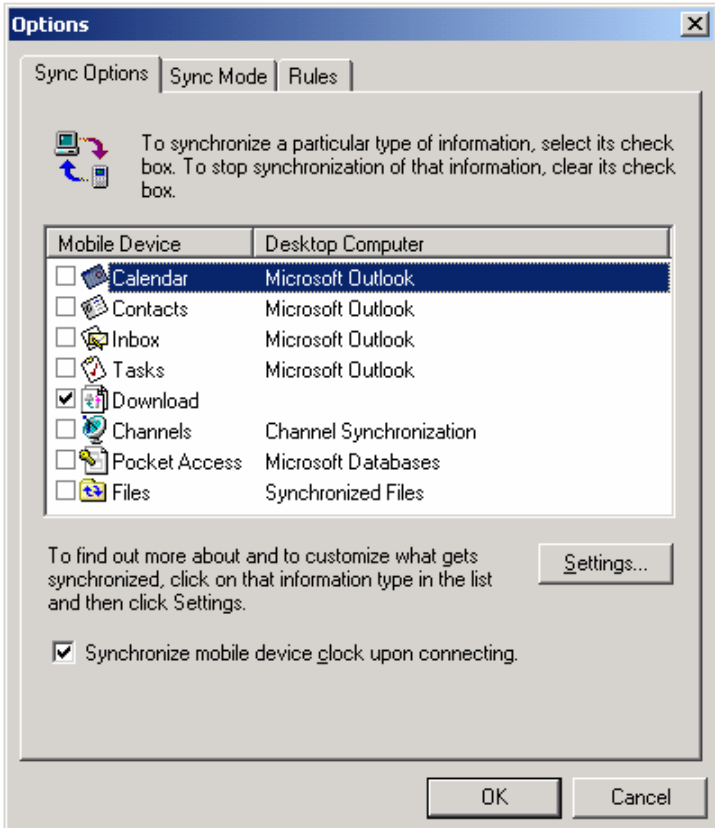
Once you have configured your application in ProcessView and saved the Pocket ProcessView display file, you can use the file Download to Windows CE Utility in ProcessView to download configuration files from GraphWorX, TrendWorX, and AlarmWorX to your Pocket or CE device. When developing a configuration file for a Pocket ProcessView application, this feature allows you to download the configuration file to a Windows CE or Pocket PC device. The file download function uses Microsoft ActiveSync to connect to the CE device.

Setting up the Download

The download to CE tool requires modules on both a desktop or workstation PC as well as a Pocket PC or CE device, because Microsoft ActiveSync services are used for connecting and authenticating the CE device.

Configuring the Desktop

The desktop is the only part that has to be configured. If the file download tool is installed properly, it will be listed in the ActiveSync Manager list of ActiveSync modules in the **Sync Options** tab of the Windows **Options** dialog box. You must enable the file download ActiveSync module in the ActiveSync Manager by checking the **Download** box, as shown in the figure below.

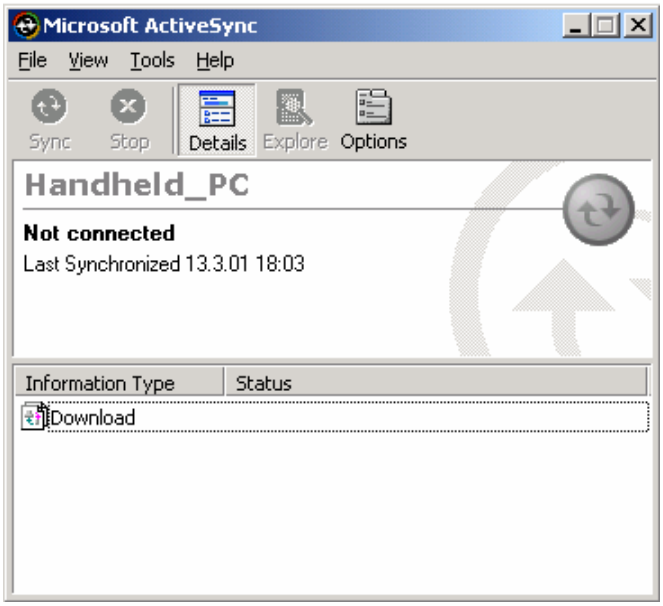


Windows Options Dialog Box

An association with the CE device must be created to synchronize the download ActiveSync modules, as shown in the figure below. When the CE device responds without any problems, the download synchronization module is active.

When enabled, the file download tool immediately downloads the configuration file for Windows CE to the CE device. When disabled, the configured file will only be saved.

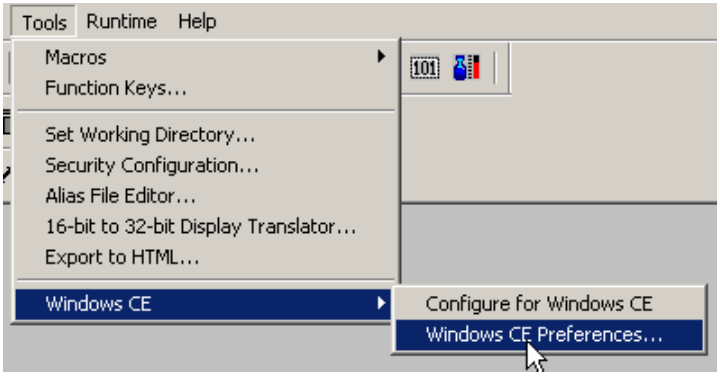
For more information about Microsoft ActiveSync services, please refer to the Microsoft ActiveSync help documentation.



Microsoft ActiveSync

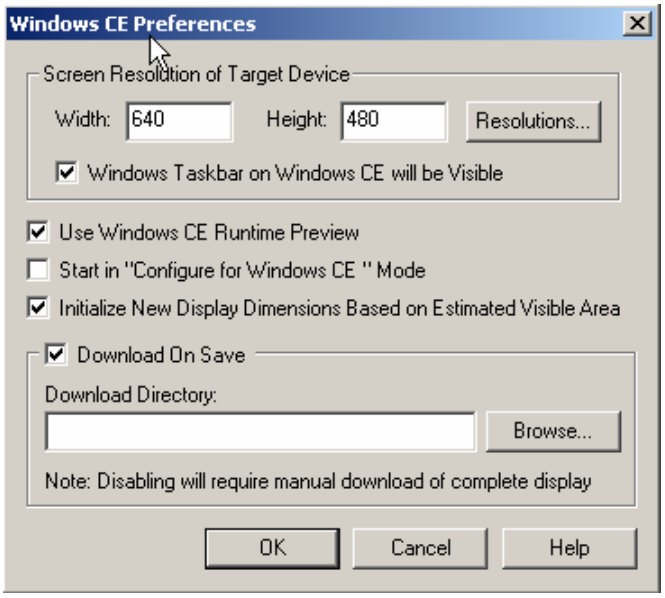
File Download Application Configuration

GraphWorX, TrendWorX, and AlarmWorX have their own version of the file download tool. In these applications, choose **Tools > Windows CE > Windows CE Preferences,** as shown in the figure below.



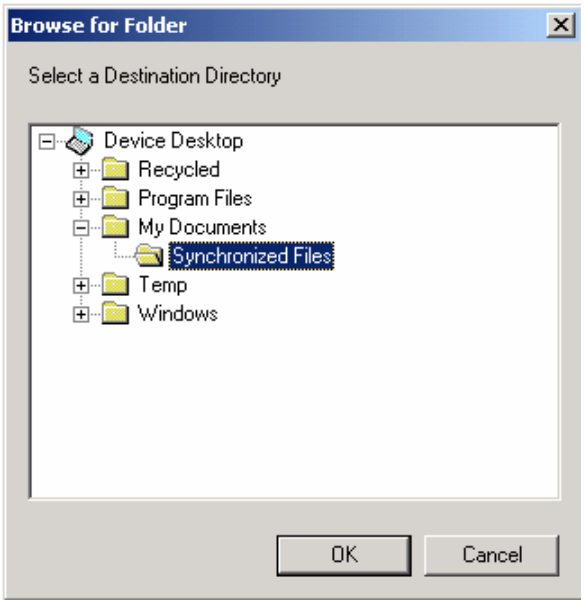
Starting the Windows CE Download Tool

This opens the **Windows CE Preferences** dialog box, which allows you to enable or disable the file download tool. To enable this tool, check the **Download On Save** check box. Then select the destination directory on the CE device by entering the path name in the **Download Directory** field, as shown in the figure below.



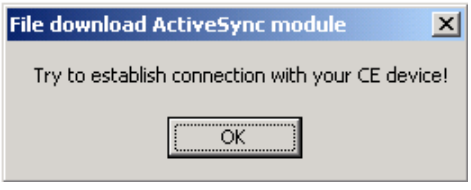
Setting Windows CE Preferences

You can also click the **Browse** button to select the destination directory. Clicking the **Browse** button opens the **Browse for Folder** dialog box, which shows the CE device directories, as shown in the figure below. A warning message box will be displayed when the file download ActiveSync module is inactive.



Browsing for a Folder on the CE Device

To establish a connection with the CE device, click **OK,** as show in the figure below.



File Download ActiveSync Module

You can also use the **Windows CE Preferences** dialog box to configure other settings for the CE device. You can set the resolution of the target device by clicking the **Resolution** button. This displays a list of resolutions from 200 x 320 up to 1024 x 768.

Downloading the File to the CE Device

When you have finished configuring a display file and would like to save it to Windows CE, choose **Save As** from the **File** menu. This opens the **Save As** dialog box.

In GraphWorX, enter the file name and select either "GraphWorX Displays for WinCE (*.gdc)" or "GraphWorX Templates for WinCE (*.gdc)" from the **Save As Type** box.

In AlarmWorX, enter the file name and select "AWXview32 CE File (*.awv)" from the **Save As Type** box.

In TrendWorX, enter the file name and select "TWXviewerCE File (*.tce)" from the **Save As Type** box.

The SMAR **Import File** dialog box will be displayed, indicating that the files are downloading to the Windows CE device.

Starting Pocket ProcessView Applications on Your Pocket PC

Once you have downloaded your GraphWorX, AlarmWorX, or TrendWorX configuration files from your desktop PC to your Pocket PC or CE device, you can run the applications on your Pocket PC. The Pocket ProcessView client applications (Pocket GraphWorX, Pocket AlarmWorX, and Pocket TrendWorX) are located in the **SMAR/Pocket ProcessView** directory on your Pocket PC. Open the application you wish to run, and then select **Open** from the **File** menu. Browse for the desired .gdc, .awv, or .tce file.

Chapter 2

Introduction to the AlarmWorX Indicator ActiveX

The AlarmWorX Indicator ActiveX, shown below, notifies you of alarms that are occurring in your ProcessView system. The flexible Alarm Indicator allows you to monitor alarm activity from virtually anywhere on your computer display, including various container applications as well as the Windows taskbar.

AlarmWorX Indicator ActiveX

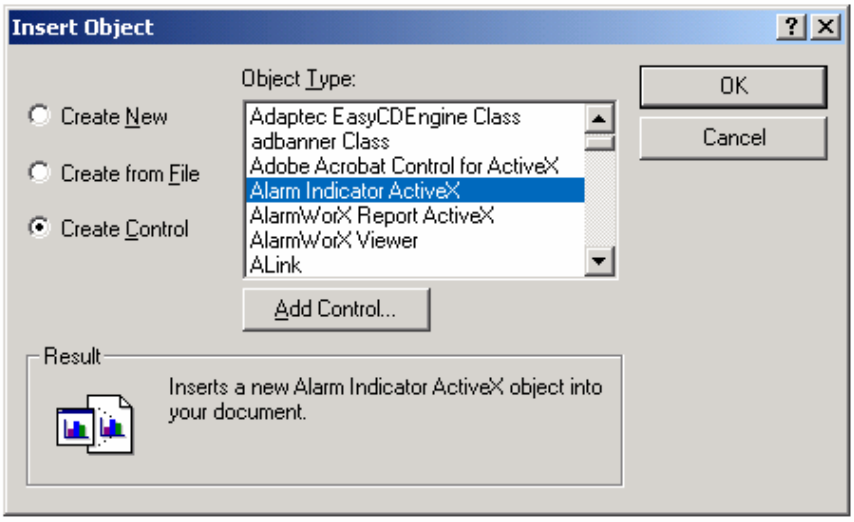
The Alarm Indicator includes the following features:

- Monitors the alarm status of the aggregate system
- Configurable color, flashing, and sound parameters
- Configuration for multiple alarm severity ranges
- Sound suppression
- Sizing and scaling for increased flexibility
- Support for multiple concurrent instances
- Global sound suppression for multiple instances
- Ability to launch applications from Alarm Indicator
- Configuration of alarm filters and subscriptions
- Support for custom image files
- Support for custom sound files

The AlarmWorX Indicator ActiveX is included in the ProcessView installation. It can be inserted into any container (such as GraphWorX, AlarmWorX, TrendWorX, Microsoft Visual Basic forms, Microsoft Word, and Microsoft Excel) that has the capability to embed ActiveX objects.

AlarmWorX Indicator ActiveX Properties

To insert the AlarmWorX Indicator ActiveX, choose **Insert New Object** from the **Edit** menu in any of the ProcessView containers, including GraphWorX, TrendWorX, and AlarmWorX. This opens the **Insert Object** dialog box, shown below. Select **AlarmWorX Indicator ActiveX** from the list of object types in the **Insert Object** dialog box. Alternatively, you can click the **AlarmWorX Indicator ActiveX** button on the **ActiveX** toolbar.



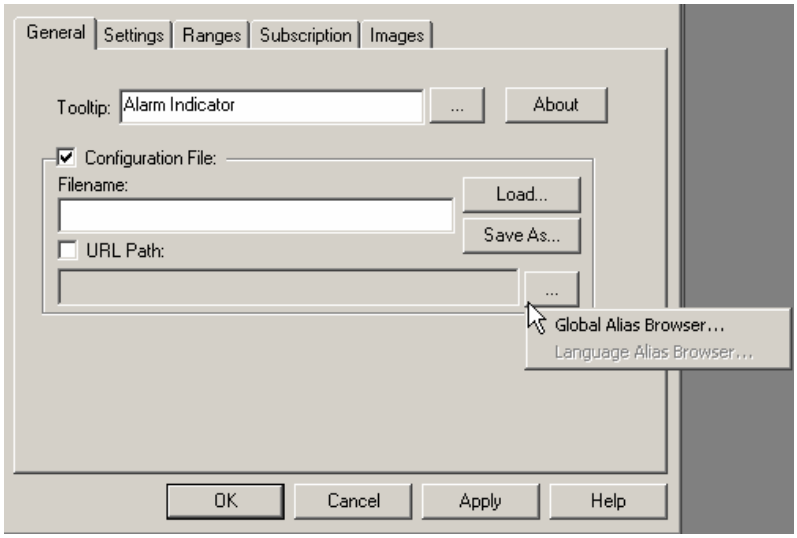
Insert Object Dialog Box

Double-clicking on the Indicator ActiveX (or right-clicking and then selecting **AlarmWorX Indicator ActiveX Object** from the pop-up menu) opens the **AlarmWorX Indicator ActiveX Properties** dialog box, which contains the following tabs:

- **General**
- **Settings**
- **Ranges**
- **Subscription**
- **Images**

General Tab

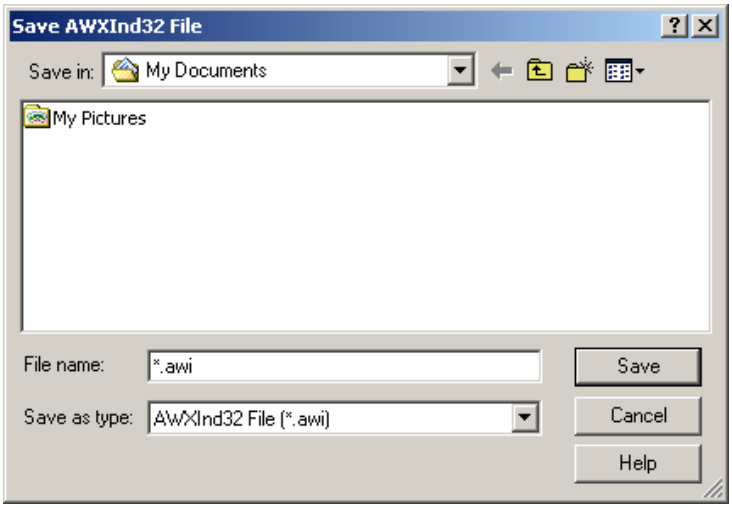
The **General** tab of the **AlarmWorX Indicator ActiveX Properties** dialog box, shown below, allows you to specify the text for the ToolTip that appears when the mouse pointer is placed over the Indicator ActiveX during runtime mode. Simply enter the desired text in the **ToolTip** field. In the example below, the text "Alarm Indicator" will appear in the ToolTip during runtime mode.



AlarmWorX Indicator ActiveX Control Properties: General Tab

Configuration File

By default, information is stored as part of the container application's document file. If the **Configuration File** check box is checked, as shown above, information is stored as part of a separate (.awi) file. To save the .awi file, click **Save As** to open the **Save AWXInd File** dialog box, shown below. Enter the name for the .awi file in the **File Name** field.



Saving an .awi File

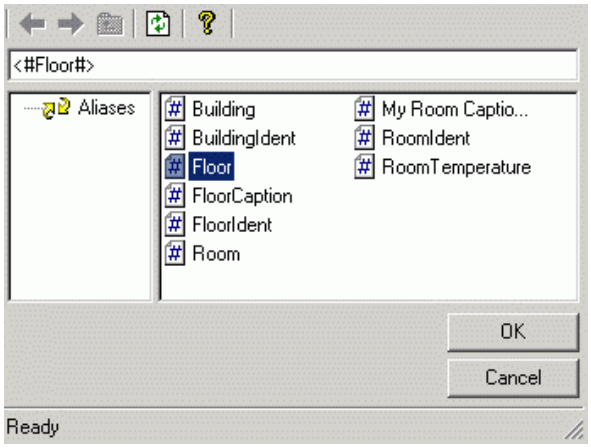
You can also open an existing configuration file by clicking the **Load** button on the **General** tab and browsing for the file. If **Configuration File** is selected, the viewer will attempt to load from the file listed in Filename. If both **Configuration File** and **URL Path** are selected, the ActiveX will use the URL path upon loading the file.

You can also open an existing configuration file by clicking the **Load** button on the **General** tab and browsing for the file. If Configuration File is selected, the Report ActiveX will attempt to load from the file listed under **File name.** If **URL Path** is checked, the ActiveX will use the specified network URL path upon loading the file.

Note: The ActiveX cannot be saved to a URL path. To create a URL file, save a report configuration to a local file and copy the file to the desired network location.

Clicking the **About** button on the **General** tab opens the **About Box,** which contains information about this product.

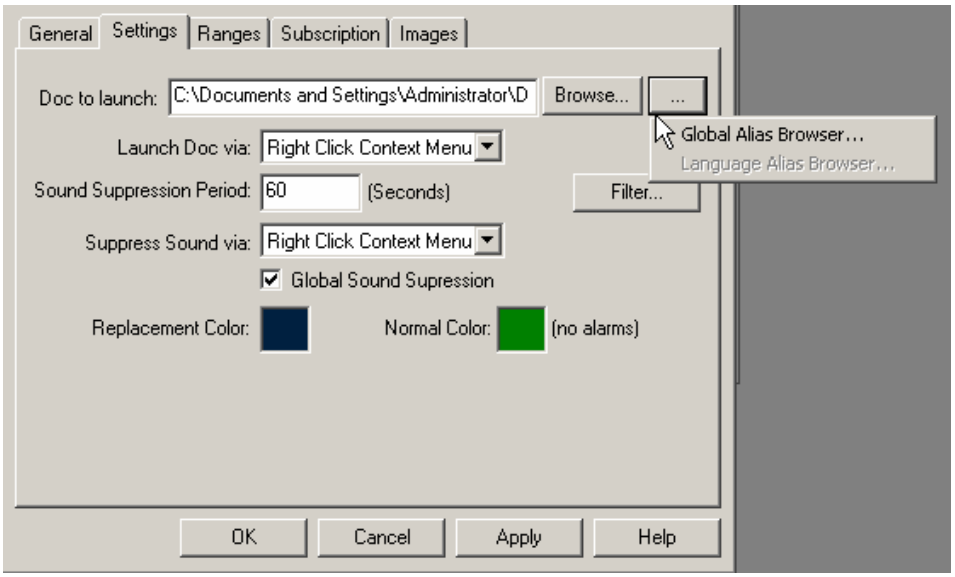
You can also select aliases to use for the configuration file. Clicking the **...** button and selecting **Global Alias Browser** from the pop-up menu opens the Global Alias Browser, as shown in the figure below. Select a global alias from the Global Alias Browser, which includes all global aliases in the global alias database. This eliminates the need to manually type in the alias name. All global aliases that are configured in the Global Alias Engine Configurator are conveniently available to choose from inside the browser. The tree control of the Global Alias Engine Configurator is mimicked in the tree control of the Global Alias Browser. Select a global alias by double-clicking the alias name (e.g. "Floor" in the figure below). The alias name appears at the top of the browser, which automatically adds the <# and #> delimiters to the alias name. Click the **OK** button.



Selecting an Alias From the Global Alias Browser

Settings Tab

The **Settings** tab of the **AlarmWorX Indicator ActiveX Properties** dialog box, shown below, allows you to configure the runtime settings for the Alarm Indicator ActiveX. Runtime options for the Indicator ActiveX include launching an application and suppressing the sound (if a sound is used to indicate an alarm) when you click on the ActiveX.



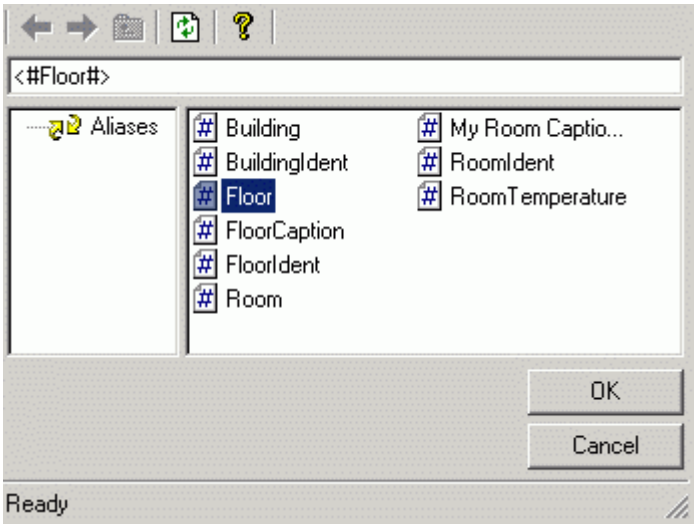
AlarmWorX Indicator ActiveX Control Properties: Settings Tab

Launching an Application From the Indicator ActiveX

The **Doc to Launch** field enables you to specify an application to be launched from the Indicator ActiveX. Click the **Browse** button to select an application file. In the **Launch Doc Via** field, choose the method by which you want the application to be launched (**Single-Click, Double-Click,** or **Right-Click Context Menu**). For example, suppose you want to launch a Microsoft Excel document by right-clicking the Alarm Indicator ActiveX when an alarm is indicated in runtime mode. First select your Excel document in the **Doc to Launch** field, and then select **Right-Click Context Menu** from the **Launch Doc Via** field. In runtime mode, right-click the Indicator ActiveX and then select **Launch Doc** from the pop-up menu, as shown below**.**

Launching an Application During Runtime

You can also select aliases to use for the Doc to **Launch** field. Clicking the **...** button and selecting **Global Alias Browser** from the pop-up menu opens the Global Alias Browser, as shown in the figure below. Select a global alias from the Global Alias Browser, which includes all global aliases in the global alias database. This eliminates the need to manually type in the alias name. All global aliases that are configured in the Global Alias Engine Configurator are conveniently available to choose from inside the browser. The tree control of the Global Alias Engine Configurator is mimicked in the tree control of the Global Alias Browser. Select a global alias by double-clicking the alias name (e.g. "Floor" in the figure below). The alias name appears at the top of the browser, which automatically adds the <# and #> delimiters to the alias name. Click the **OK** button.



Selecting an Alias From the Global Alias Browser

Turning off the Sound of an Alarm Indicator

If you have configured a sound to be used when an alarm is indicated, you can turn off the sound during runtime mode. The **Settings** tab allows you to configure the parameters for sound suppression. The **Sound Suppression Period** is the duration of sound suppression (in seconds). In the **Suppress Sound Via** field, choose the method by which you want turn off the sound (**Single-Click, Double-Click,** or **Right-Click Context Menu**). For example, if you want to turn off the sound by right-clicking the Alarm Indicator ActiveX when an alarm is indicated in runtime mode, select **Right-Click Context Menu** from the **Suppress Sound Via** field. In runtime mode, right-click the Indicator ActiveX and then select **Suppress Sound** from the pop-up menu, as shown below.

Note: The "suppress sound" method can be coupled with the "launch doc" method. For example, suppose **Double-Click** is selected in both the **Suppress Sound Via** field and the **Launch Doc Via** field. When the Alarm indicator is double-clicked during runtime mode, the selected application will be launched, *and* the sound will be turned off.

Turning off Sound During Runtime

Global Sound Suppression

If multiple instances of the Alarm Indicator ActiveX are running concurrently and each instance is configured to produce a sound indicating an alarm, you can use the **Global Sound Suppression** function in the **Settings** tab to monitor the sound status of all instances. For example, suppose you have two Alarm Indicators open (Alarm Indicator 1 and Alarm Indicator 2). If Alarm Indicator 1 sounds an alarm, and the **Global Sound Suppression** check box is checked, the sound of Alarm Indicator 2 will be temporarily suppressed until Alarm Indicator 1 stops making a sound.

Note: The **Launch Doc, Suppress Sound,** and **Properties** commands are generally available on the right-click menu of the Alarm Indicator ActiveX during runtime mode (depending on the Security server settings). The **Properties** command opens the **AlarmWorX Indicator ActiveX Properties** dialog box.

Choosing Colors for the Alarm Indicator

When an alarm is triggered, the Alarm Indicator ActiveX will flash repeatedly to visually indicate the alarm. In the **Settings** tab, you can set the color of the flash. First select the **Normal Color** by clicking on the color palette. The normal color is the runtime color of the ActiveX when there is no alarm.

The flashing of the Alarm Indicator during runtime mode is made possible by simply replacing the normal color with a replacement color. Select the **Replacement Color** by clicking on the color palette. For example, if the normal color is green and the replacement color is red, the light bulb of the Alarm Indicator will be green when no alarms are occurring, as shown below.

Example of Normal Color (No Alarm)

If an alarm occurs, the bulb will flash red, as shown below.

Example of Replacement Color (Alarm Occurring)

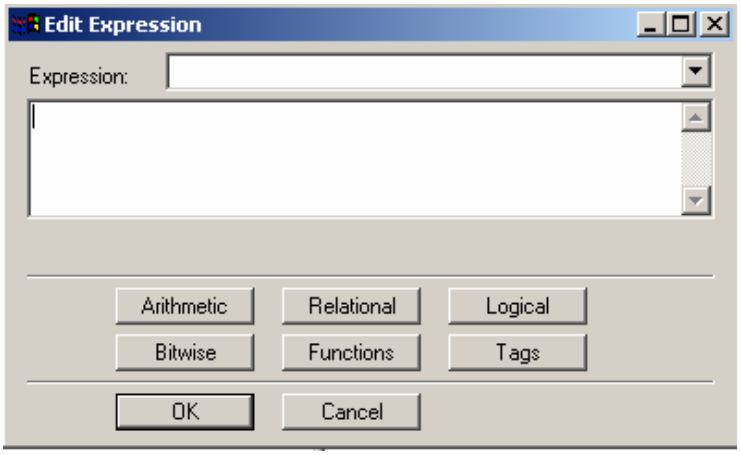
Setting Up Filters

Clicking the **Filter** button on the **Settings** tab opens the **Edit Expression** dialog box. For more information, please see the **Expression Editor** section.

Expression Editor

Clicking the **Filter** button on the **Settings** tab opens the **Edit Expression** dialog box, shown below, which contains the following options that enable you to set up alarm filters:

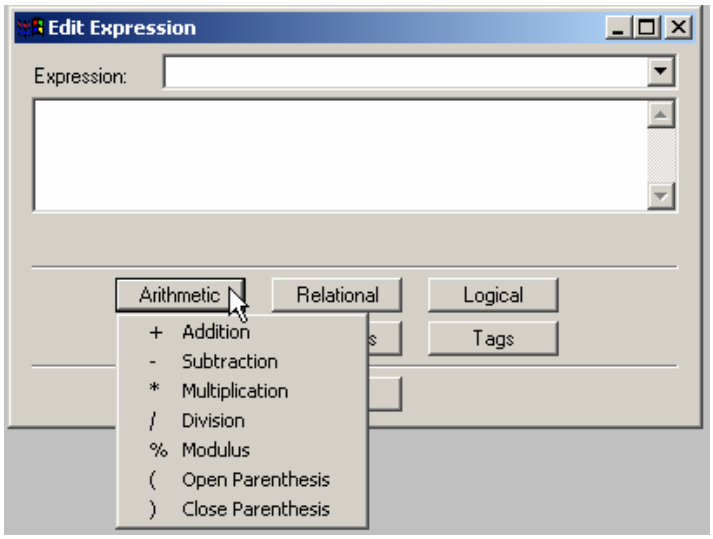
- **Arithmetic**
- **Relational**
- **Logical**
- **Bitwise**
- **Functions**
- **Tags**



Edit Expression Dialog Box

Arithmetic

The **Arithmetic** menu symbols are shown in the figure below.



Arithmetic Symbols

The symbols '+', '-', '*', '/' and '%' use the following format:

expression :: parameter **symbol** parameter

Where

Parameter	A local variable, an OPC tag, a constant, or another expression
Symbol	+ or - or * or / or %

Result

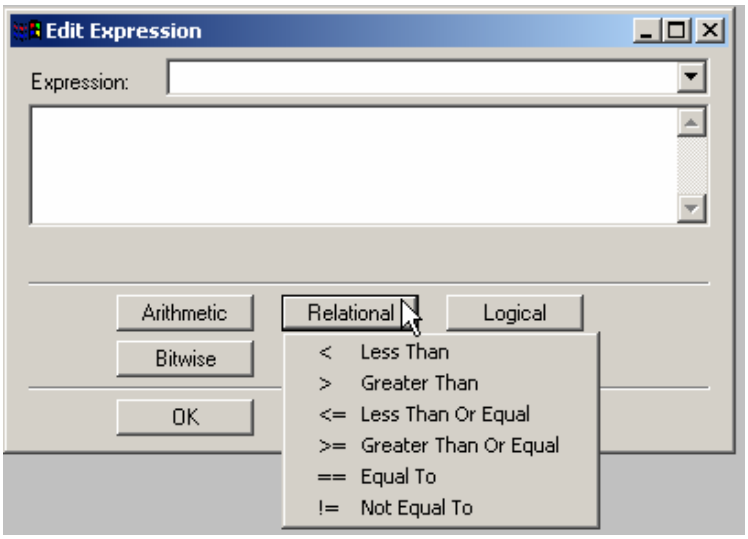
The expression results in a number of any type (float, long, etc.).

Examples

SYMBOL	DESCRIPTION	EXAMPLE	RESULT
+	Addition	~~var1~~ + ~~var2~~	8+3 = 11
-	Subtraction	~~var1~~ - ~~var2~~	8-3 = 5
*	Multiplication	~~var1~~ * ~~var2~~	8*3 = 24
/	Division	~~var1~~ / ~~var2~~	8/3 = 2.66667
%	Calculates the remainder after division	~~var1~~ % ~~var2~~	8%3 = 2
(and)	Gives precedence to parts of the calculation	~~var1~~ / (~~var2~~ + ~~var3~~)	8/(3+2) = 1.6

Relational

The **Relational** menu symbols are shown in the figure below.



Relational Symbols

The symbols '<', '>', '<=', '>=', '==' and '!=' use the following format:

expression :: parameter **symbol** parameter

Where

Parameter	A local variable, an OPC tag, a constant, or another expression
Symbol	< or > or <= or >= or == or !=

Result

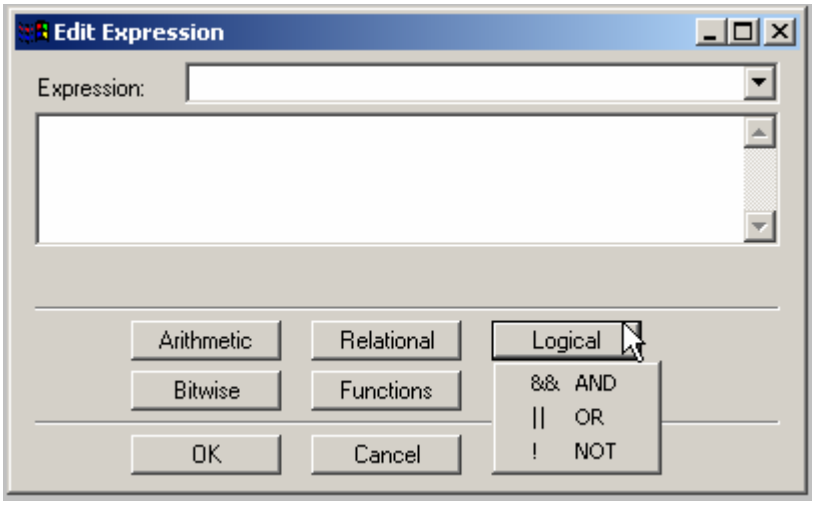
The expression results in a Boolean value (0 or 1).

Examples

SYMBOL	DESCRIPTION	EXAMPLE	RESULT
<	Less than	~~var1~~ < ~~var2~~	8<3 = 0
>	Greater than	~~var1~~ > ~~var2~~	8>3 = 1
<=	Less than or equal to	~~var1~~ <= ~~var2~~	8<=3 = 0
>=	Greater than or equal to	~~var1~~ >= ~~var2~~	8>=3 = 1
==	Equal to	~~var1~~ == ~~var2~~	8==3 = 0
!=	Not equal to	~~var1~~ != ~~var2~~	8!=3 = 1

Logical

The **Logical** menu symbols are shown in the figure below.



Logical Symbols

The symbols '&&' and '||' use the following format:

expression :: parameter **symbol** parameter

The symbol '!' uses the following format:

expression :: **symbol** parameter

Where

Parameter	A local variable, an OPC tag, a constant, or another expression
Symbol	&& or || or !

Result

The expression results in a Boolean value (0 or 1).

Truth table

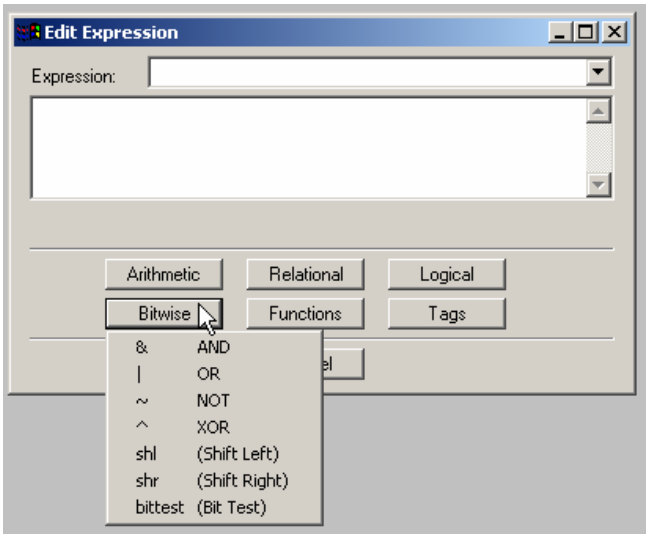
~~var1~~	0		not 0	
~~var2~~	0	not 0	0	not 0
~~var1~~ && ~~var2~~	0	0	0	1
~~var1~~ || ~~var2~~	0	1	1	1
!~~var1~~	1	1	0	0

Examples

SYMBOL	DESCRIPTION	EXAMPLE	RESULT
&&	And	~~var1~~ && ~~var2~~	8 && 3 = 1
||	Or	~~var1~~ || ~~var2~~	8 || 3 = 1
!	Not	!~~var1~~	!8 = 0

Bitwise

The **Bitwise** menu symbols are shown in the figure below.



Bitwise Symbols

The symbols '&', '|', and '^' of the bitwise group use the following format:

expression :: parameter **symbol** parameter

The symbol '~' of the logical group uses the following format:

expression :: **symbol** parameter

The symbols 'shl' and 'shr' of the bitwise group use the following format:

expression :: **symbol** (value, shift by)

Where

Parameter	A local variable, an OPC tag, a constant, or another expression
Symbol	&& or || or ^ or shl or shr or ~

Result

The expression results in a number when the parameters used contain numbers.

Bit Table

	BINARY (DECIMAL)	BINARY (DECIMAL)
~~var1~~	0000.0000.0000.1000 - (8)	0000.0000.0110.0000 - (96)
~~var2~~	0000.0000.0000.1010 - (10)	0000.0000.0000.1000 - (8)
~~var1~~ & ~~var2~~	0000.0000.0000.1000 - (8)	0000.0000.0000.0000 - (0)
~~var1~~ | ~~var2~~	0000.0000.0000.1010 - (10)	0000.0000.0110.1000 – (104)
~~var1~~ ^ ~~var2~~	0000.0000.0000.0010 - (2)	0000.0000.0110.1000 - (104)
shl (~~var1~~,3)	0000.0000.0100.0000 - (64)	0000.0011.0000.0000 - (768)
shr (~~var1~~,3)	0000.0000.0000.0001 - (1)	0000.0000.0000.1100 - (12)
~(~~var1~~)	1111.1111.1111.0111 - (-9)	1111.1100.1111.1111 - (-97)
bittest(~~var1~~,3)	0000.0000.0000.0001 - (1)	0000.0000.0000.0000 - (0)

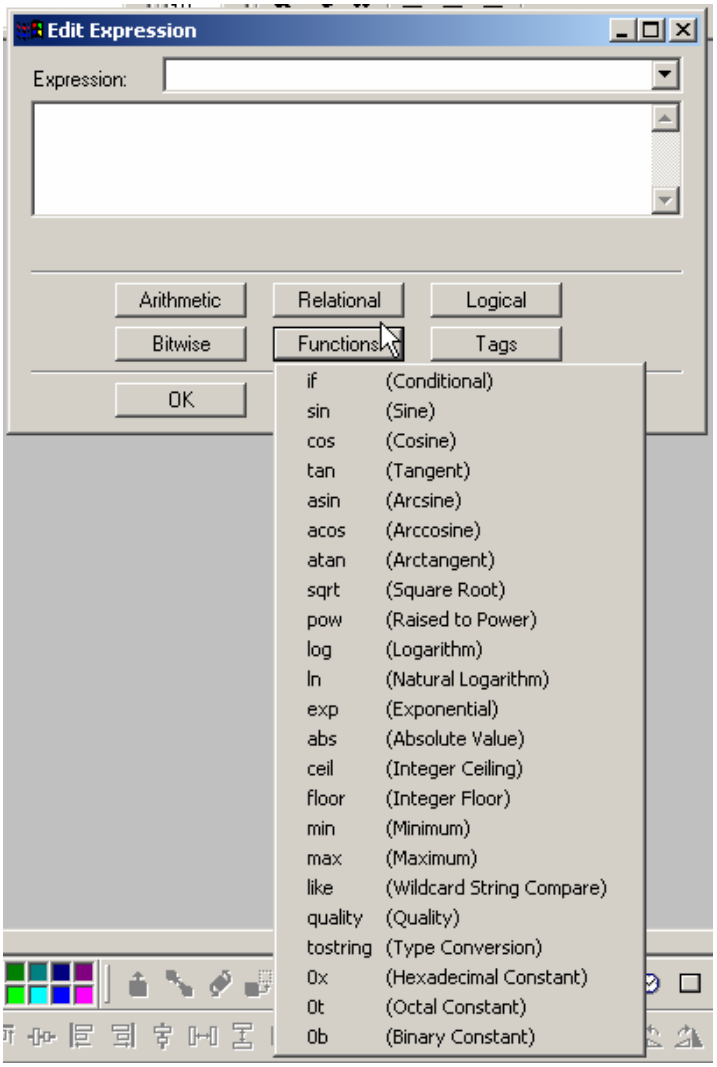
Examples

SYMBOL	DESCRIPTION	EXAMPLE	RESULT
&	Bit And	~~var1~~ & ~~var2~~	8 && 3 = 0
|	Bit Or	~~var1~~ | ~~var2~~	8 || 3 = 11
^	Bit eXclusive Or	~~var1~~ ^ ~~var2~~	8^3=11
shl	Bit shift left	shl(~~var1~~,3)	8<<3=64
shr	Bit shift right	shr(~~var1~~,3)	8>>3=1
~	Not (two's complement)	~(~~var1~~)	!8 = -9
bittest	Bit Test	bittest (5 , 0)	1

Note: The bittest function requires you to specify the position of the bit to be tested. You must indicate that it starts from 0. In other words, a bit position of "0" indicates the "less significant" bit.

Functions

The **Functions** menu options are shown in the figure below.



Functions Menu Options

The symbols 'sin', 'asin', 'cos', 'acos', 'tan', 'atan', 'log', 'ln', 'exp', 'sqrt', 'abs', 'ceil', and 'floor' use the following format:

expression :: **symbol** (parameter)

The symbols 'pow', 'min', and 'max' use the following format:

expression :: **symbol** (parameter,parameter)

The symbol 'if' uses the following format:

expression :: **symbol** (parameter,parameter,parameter)

Where

Parameter	A local variable, an OPC tag, a constant, or another expression
Symbol	sin, asin, cos, acos, tan, atan, log, ln, exp, sqrt, abs, ceil, floor, min, max, pow, or if

Result

The expression results in a number.

Examples

Symbol	Description	Example	Result
sin	sine of an angle in radians	sin(~~var1~~)	sin(0.785)=0.71
cos	cosine of an angle in radians	cos(~~var1~~)	cos(0.785)=0.71
tan	tangent of an angle in radians	tan(~~var1~~)	tan(0.785)=1.0
asin	arc sine returns an angle in radians	asin(~~var1~~)	asin(0.5)=0.52
acos	arc cosine returns an angle in radians	acos(~~var1~~)	acos(0.5)=1.05
atan	arc tangent returns an angle in radians	atan(~~var1~~)	atan(1)=0.785
sqrt	Returns the square root	sqrt(~~var1~~)	sqrt(100)=10
pow	Returns value 1 raised to the power value 2	pow(~~var1~~,~~var2~~)	pow(100,1.5)=1000
log	10 based logarithm	log(~~var1~~)	log(100)=2
ln	*e* based logarithm	ln(~~var1~~)	ln(7.389)=2
exp	Exponential	exp(~~var1~~)	exp(2)=7.389
abs	Absolute value	abs(~~var1~~)	abs(-1)=1
ceil	Integer ceiling	ceil(~~var1~~)	ceil(7.39)=8
floor	Integer floor	floor(~~var1~~)	floor(7.39)=7
min	Lowest value of two	min(~~var1~~,~~var2~~)	min(10,5)=5
max	Highest value of two	max(~~var1~~,~~var2~~)	min(10,5)=10
if	Conditional statement	if(~~var1~~<~~var2~~, ~~var1~~,~~var2~~)	if(5<8,5,8)=5
like	Wildcard string compare	Like(string, pattern, casesensitive')	
quality	Quality of tag or expression	See below.	See below.
tostring	Type conversion	See below.	See below.
0x	Hexadecimal constant	x=0x11	17
0t	Octal constant	x=0t11	9
0b	Binary constant	x=0b11	3

Note: For the like operator: "string" equals the string to search in; "pattern" equals the string to search for (can include wildcards); nonzero for case-sensitive search; zero for case-insensitive search. String syntax is $"string"$.

You can use these special characters in pattern matches in string:

- ? Any single character.
- Zero or more characters.
- # Any single digit (0-9).
- [charlist] Any single character in charlist.
- [!charlist] Any single character not in charlist.

Quality

The **quality** option on the **Functions** menu of the **Expression Editor** is used to evaluate the quality of an OPC tag or an expression.

The following general syntax is used for quality expressions:

x=quality(expression)

Note: The "(expression)" can also be a simple expression composed of a single tag.

The **quality** function returns the OPC quality of the string between parentheses as one of the following results:

- 192: quality is GOOD
- 64: quality UNCERTAIN
- 0: quality BAD

Note: The OPC Foundation establishes the value ranges for quality. There are actually varying degrees of quality:

- GOOD: 192-252
- UNCERTAIN: 64-191
- BAD: 0-63

For more information, refer to the *OPC Data Access Custom Interface Standard* available for download at the OPC Foundation's Web site, www.opcfoundation.org/.

Example Quality Expression

EXPRESSION	RESULT
x=quality({{Smar.Simulator.1\SimulatePLC.PumpStatus}})	192 (Quality GOOD)

The quality of an expression is determined through the evaluation of each single tag in the expression. Thus, if you have multiple tags in an expression (and each tag has a different quality), the result of the expression (i.e. 192 [GOOD], 64 [BAD], or 0 [UNCERTAIN]) corresponds to the quality of the tag with the lowest quality. If an expression contains a conditional statement (e.g. if, then, or else), then the result of the expression is affected only by the quality of the branch being executed.

Consider the following sample expression:

x= if (quality({{Tag1}}) == 192, {{Tag1}}, {{Tag2}})

This expression can be read as follows:

"If the quality of Tag1 is GOOD (i.e. 192), then the expression result (x) is the value of Tag1. In all other cases (i.e. the quality of Tag1 is UNCERTAIN or BAD), the expression result (x) is the value of Tag2."

We can calculate the results for this expression using different qualities for Tag1 and Tag2, as shown in the figure below.

CASE	TAG1 QUALITY	TAG2 QUALITY	RESULT	RESULT QUALITY
1	GOOD	GOOD	Tag1	192 (GOOD)
2	GOOD	UNCERTAIN	Tag1	192 (GOOD)
3	GOOD	BAD	Tag1	192 (GOOD)
4	UNCERTAIN	GOOD	Tag2	192 (GOOD)
5	UNCERTAIN	UNCERTAIN	Tag2	64 (UNCERTAIN)
6	UNCERTAIN	BAD	Tag2	0 (BAD)
7	BAD	GOOD	Tag2	192 (GOOD)
8	BAD	UNCERTAIN	Tag2	64 (UNCERTAIN)
9	BAD	BAD	Tag2	0 (BAD)

In cases 1-3 above, the quality of Tag1 is GOOD, and therefore the result of the expression is GOOD. Thus, the result of the expression is not affected by the quality of Tag2 (the “else” branch of the expression), which is ignored.

In cases 4-6, the quality of Tag1 is UNCERTAIN, and therefore the result of the expression is the quality of Tag2.

In cases 7-9, the quality of Tag1 is BAD, and therefore the result of the expression is the quality of Tag2.

Note: The “quality()” function returns a value that represents the quality of the expression within the parentheses but is always GOOD_QUALITY. For example, if Tag1 is BAD_QUALITY then the expression “x=quality({{Tag1}})" will return 0 with GOOD_QUALITY.

The result of an expression is the minimum quality of the evaluated tag in the expression and is affected only by the quality of the conditional (if, then, or else) branch that is executed.

Consider the following sample expression:

x= if ({{TAG_01}}>0,{{TAG_02}},{{TAG_03}})

This expression can be read as follows:

"If the value of TAG_01 is greater than 0, then the expression result (x) is TAG_02. If the value of TAG_01 is less than or equal to 0, then the expression result (x) is TAG_03."

Let's assume that the following values and qualities for these tags:

TAG_01=5 with quality GOOD

TAG_02=6 with quality UNCERTAIN

TAG_03=7 with quality BAD

Because the value of TAG_01 is 5 (greater than 0), the expression result is TAG_02. Thus, the final expression result is 6, and the final expression quality is UNCERTAIN.

Type Conversion

The **tostring** option on the **Functions** menu of the **Expression Editor** takes the value of whatever item is in parentheses and converts it into a string as follows:

The value is +(value)+unit

It can be used to convert from number to string, and it can be very useful for string concatenation.

The proper syntax for the **tostring** option is:

x=$"The value is "$ + tostring(value) + $" unit"$

Note: In the expression above, the word "unit" is placeholder text for a user-specified unit of measurement or variable (e.g. Watt, inches, meters, etc.).

Example Expressions Type Conversion

Expression	Result
x=$"The value is "$ + tostring({{gfwsim.ramp.float}}) + $" Watt"$	“The value is 543.2345152 Watt”

Constants

The **Functions** menu of the **Expression Editor** supports constant values, including hexadecimal, octal, and binary formats.

Example Expressions Using Constants

x=0x11	17
x=0t11	9
x=0b11	3

The **Expression Editor** conveniently inserts the 0x and 0t and 0b prefixes for you so do not have to recall them.

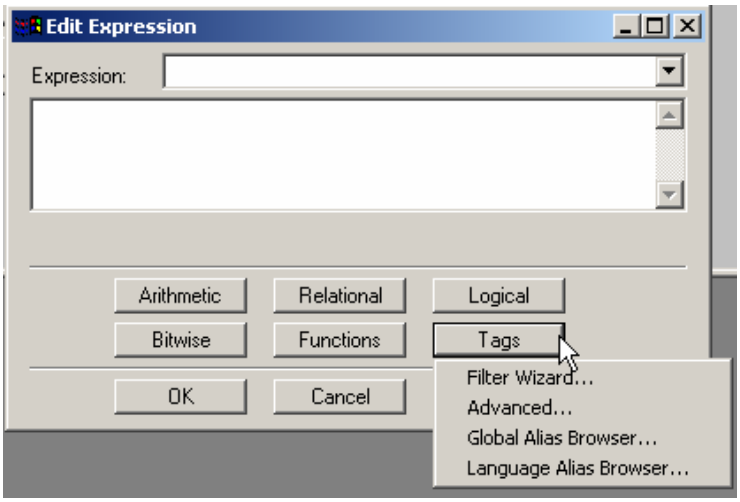
Interpreting and Translating Constants

The examples below show how values are calculated for each type of constant.

- **Hexadecimal:** 0x20A = 2 * (16^2) + 0 * (16^1) + 10 * (16^0) = 2*256 + 0*16 + 10 * 1 = 512 + 0 + 10 = 522
- **Octal:** 0t36= 3 * (7^1) + 6 *(7^0) = 3* 7 + 6* 1= 21 + 6 = 27
- **Binary:** 0b110 = 1 * (2^2) + 1 * (2^1) + 0 * (2^ 0) = 1 * 4 + 1 * 2 + 0 * 1 = 4+2+0 = 6

Tags

The menu options available under the **Tags** button of the Expression Editor are shown in the figure below. The **Expression Editor** dialog box can also be used to create and edit alarm filters. The Expression Editor provides a **Filter Wizard** and an **Alarm Tag** list to help you create simple alarm filters. If you want to customize your alarm filters, you can use the other functions in the Expression Editor to set up your alarm filters manually.

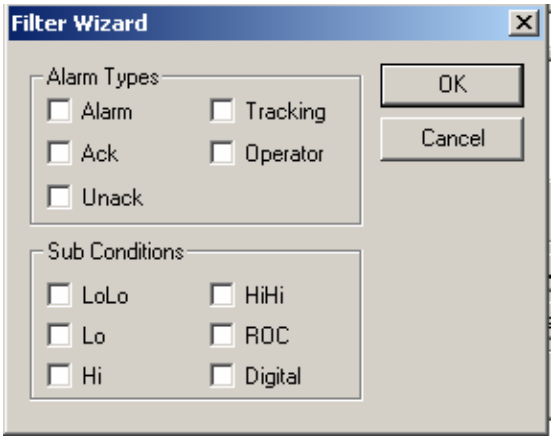


Creating Alarm Filters Using the Expression Editor

Filter Wizard

The **Filter Wizard,** shown in the figure below, allows you to choose from the following to items enter in your expression. Select one or more items, and then click **OK.** The filter string is automatically inserted into the **Edit Expression** dialog box.

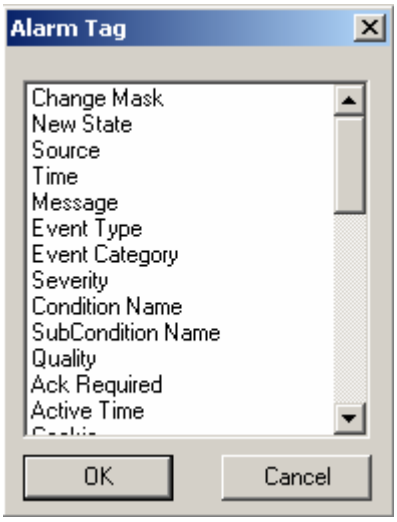
- **Alarm Types:** Alarm, Ack, Unack, Tracking, and Operator
- **Subconditions:** LoLo, Lo, Hi, HiHi, ROC, and Digital



Filter Wizard

Selecting Alarm Attributes

Selecting Advanced from the Tags menu of the Expression Editor opens the **Alarm Tag** list, shown in the figure below, which allows you to choose alarm attributes for your alarm filter. Select the attribute that you want to include in the filter expression and click **OK.**



Alarm Attributes List

There are two additional attributes available for use in filtering: **Alarm Type** and **Current Time.** The Alarm Type attribute allows you to filter alarms according to ALARM 1, ACK 2, UNACK 3, OPER 4, TRACK 5 or NORM 6. For example, you can set up a filter with the condition:

X = {{AlarmType}}

If the **Alarm Type** is true, then the alarms are displayed. If they are false then, the alarms are not displayed.

The **Current Time** attribute allows you to filter according to the current time. Only alarms occurring around the current time will be displayed.

Example Alarm Filters

X = {{Severity}} > 500.	Only alarm messages with a severity greater than 500 will be visible.
X = Like({{Source}}, $"Tag"$,0)	Only messages with the tag in the source name will be displayed.
X = 1.	Filter displays all messages.
X = 0.	Filter does not display any messages.

All filters resolve to TRUE or FALSE. All nonzero values resolve to TRUE.

For more information, please see the AlarmWorX Server documentation.

Global Aliases

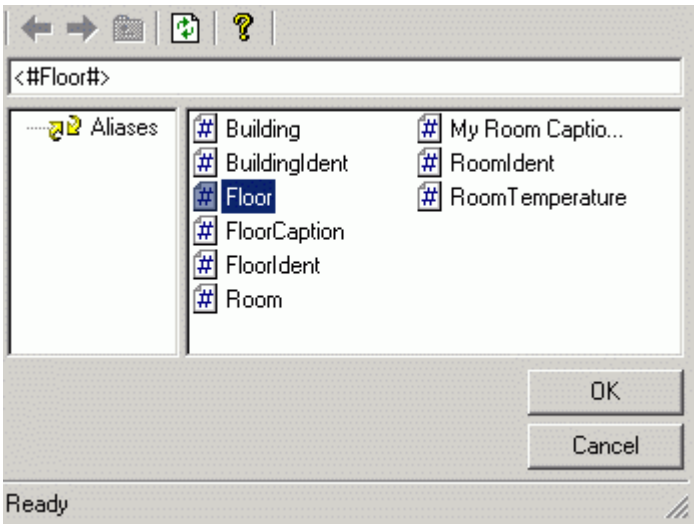
For global aliases within the expression, use the following syntax:

<#global_alias_name**#>**

Example:

x=<#RoomTemperature#>

Selecting **Global Alias Browser** opens the Global Alias Browser, as shown in the figure below. Select a global alias from the Global Alias Browser, which includes all global aliases in the global alias database. This eliminates the need to manually type in the alias name. All global aliases that are configured in the Global Alias Engine Configurator are conveniently available to choose from inside the browser. The tree control of the Global Alias Engine Configurator is mimicked in the tree control of the Global Alias Browser. Select a global alias by double-clicking the alias name (e.g. "Floor" in the figure below). The alias name appears at the top of the browser, which automatically adds the <# and #> delimiters to the alias name. Click the **OK** button.



Selecting an Alias From the Global Alias Browser

Language Aliases

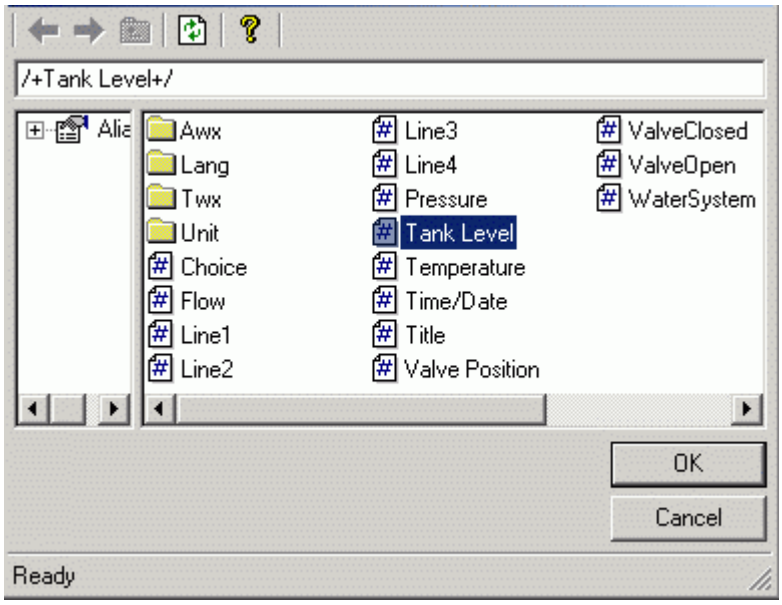
For language aliases within the expression, use the following syntax:

/+anguage_alias_name**+/**

Example:

x=/+WaterSystem+/

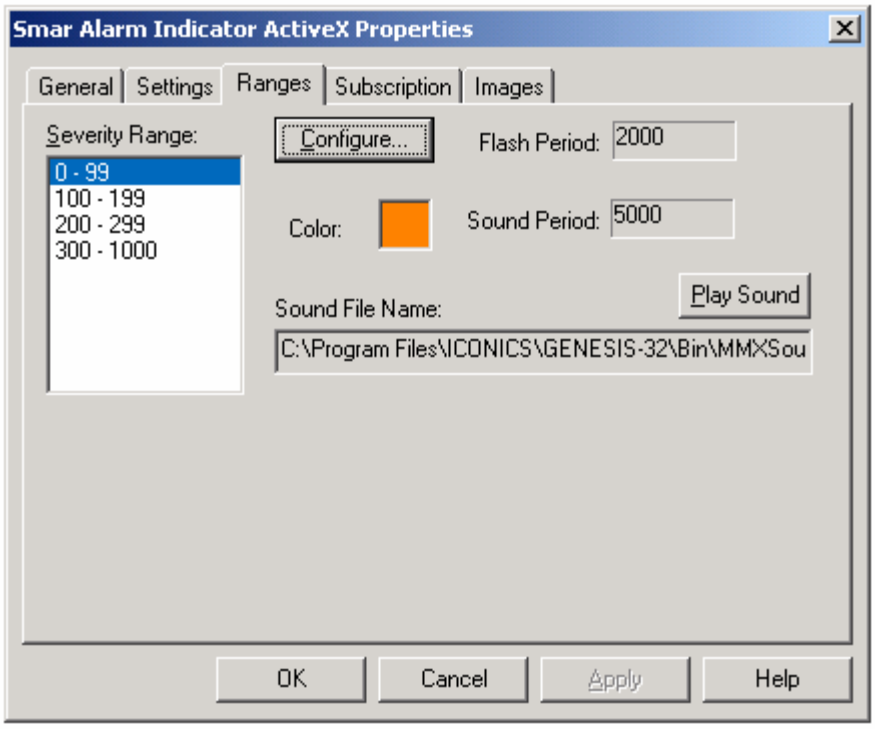
Selecting **Language Alias Browser** from the pop-up menu opens the Language Alias Browser, as shown in the figure below. The browser includes all languages aliases in the language database. All language aliases that are configured in the Language Configurator are conveniently available to choose from inside the browser. The tree control of the Language Configurator is mimicked in the tree control of the Language Alias Browser. Select a language alias by double-clicking the alias name. The alias name appears at the top of the browser, which automatically adds the /+ and +/ delimiters to the alias name. Click the **OK** button.



Selecting an Alias From the Language Alias Browser

Ranges Tab

The **Ranges** tab of the **AlarmWorX Indicator ActiveX Properties** dialog box, shown below, allows you to configure colors, flash periods, and sounds for the Alarm Indicator. The **Severity Range** field enables you to set Alarm Indicator parameters based on the severity level of alarms. The severity values range from 0-1000. Each severity range is configured separately. For example, the figure below shows the default configuration for the severity range 0-99. Each severity range has a different configuration. Thus, the next severity range (e.g. 100-199), will have a different configuration.



AlarmWorX Indicator ActiveX Control Properties: Ranges Tab

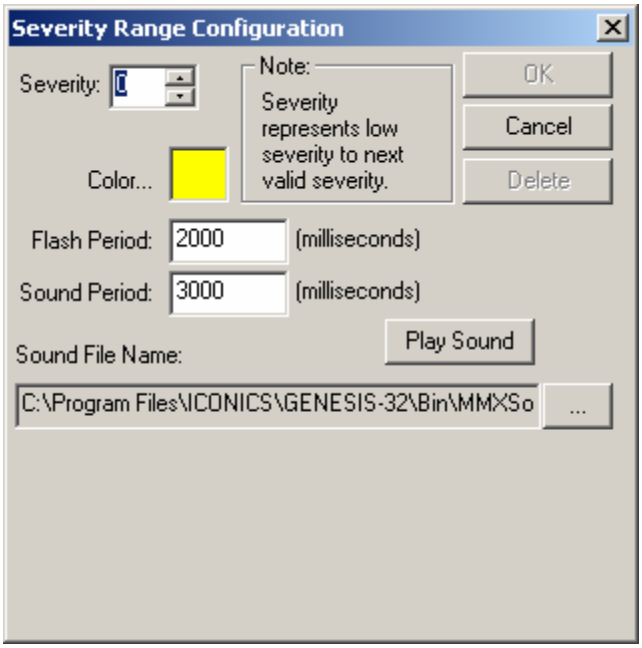
Configuring Severity Ranges for the Alarm Indicator

To configure a severity range:

1. Under the **Severity Range** field of the **Ranges** tab, select a severity range to configure.

2. Click the **Configure** button to open the **Severity Range Configuration** dialog box, shown below. The **Severity** field displays the lower limit for the selected severity range.

Note: You can customize the severity ranges by changing the "low limit" value in the **Severity** field. The new range will be displayed in the **Severity Range** field on the **Ranges** tab. The default severity value '0' cannot be deleted.



Severity Range Configuration Dialog Box

3. Choose a color that will indicate the severity level when the Alarm Indicator flashes. Click on the color palette to select a color.

4. Set the value for the flash period. The **Flash Period** is the frequency at which the Alarm Indicator will flash (in milliseconds) when an alarm occurs within the specified severity range.

5. Set the value for the sound period. The **Sound Period** is the frequency at which the Alarm Indicator will make a sound (in milliseconds) when an alarm occurs within the specified severity range.

6. Select a sound that will indicate alarms that fall under the severity range. Click the **...** button under the **Sound File Name** field to browse for a sound (.wav) file. To test the selected sound file, click the **Play Sound** button.

Note: Flashing and sound will occur for unacknowledged alarms in order of priority from the highest to lowest severity level.

7. Click **OK** to apply the changes. The new configuration settings will be shown on the **Ranges** tab.

Repeat the steps above for each severity range you wish to configure for the Alarm Indicator.

Deleting a Severity Range Configuration

To delete a severity range configuration:

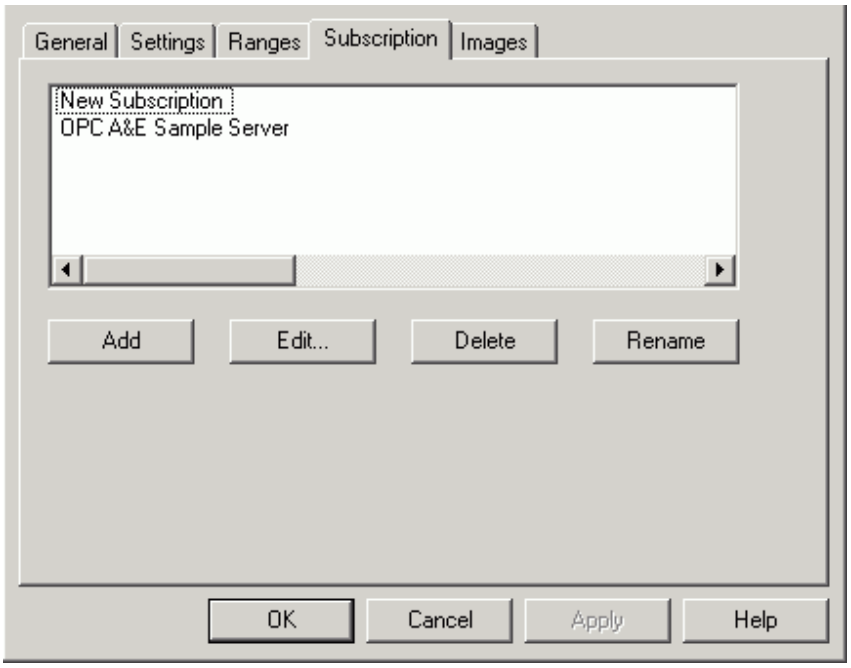
1. Select the severity range for the configuration you wish to delete in the **Ranges** tab.

2. Click the **Configure** button to open the **Severity Range Configuration** dialog box.

3. Click the **Delete** button.

Subscription Tab

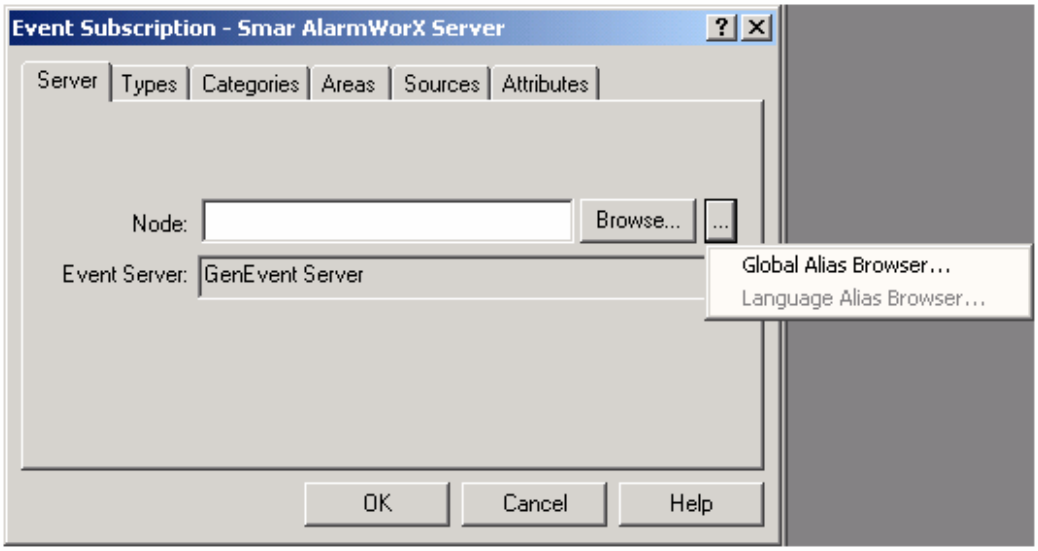
The **Subscription** tab of the **Alarm Indicator ActiveX Properties** dialog box, shown below, determines what type of OPC connection will be made. It allows you to add, rename, delete, or edit a subscription to a particular alarm. To add a new subscription, click the **Add** button.



Alarm Viewer ActiveX Properties: Subscription Tab

The subscription named "New Subscription" appears. This subscription does not contain any data, so it is necessary to immediately edit the new subscription. To do so, click the **Edit** button to open the **Event Subscription** dialog box, as shown in the figure below. It is only possible to add or edit subscriptions that are connected to active OPC Alarm and Event servers.

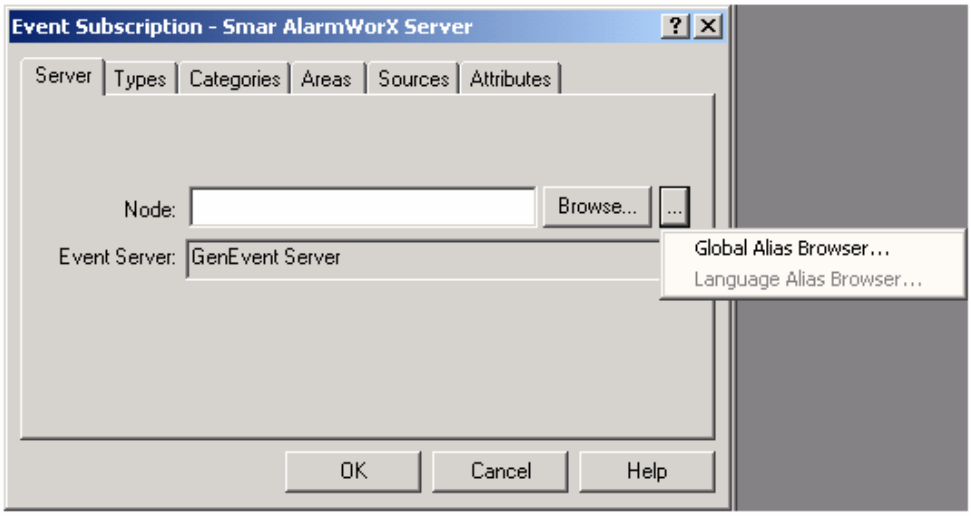
Note: It is possible for a server to have more than one subscription. In fact, it is a very effective way to achieve filtering.



Creating an Event Subscription

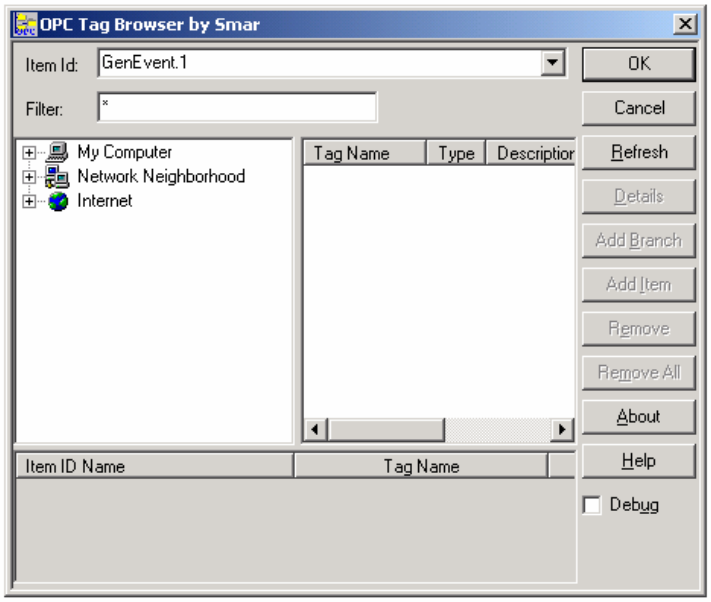
Server

The **Server** tab of the **Event Subscription** dialog box, shown in the figure below, allows you to select an **Event Server** and **Node** for each subscription. To select the event server, click the **Browse** button.



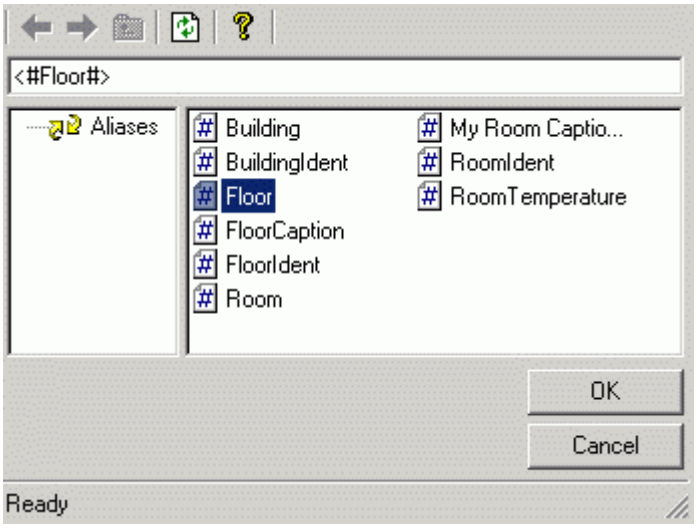
Event Subscription Dialog Box: Server Tab

This opens the **OPC Universal Tag Browser,** shown in the figure below, which lists all available Alarm and Event OPC servers. Select the desired server, and click **OK.** For local servers, it is not necessary to fill in the **Node** field.



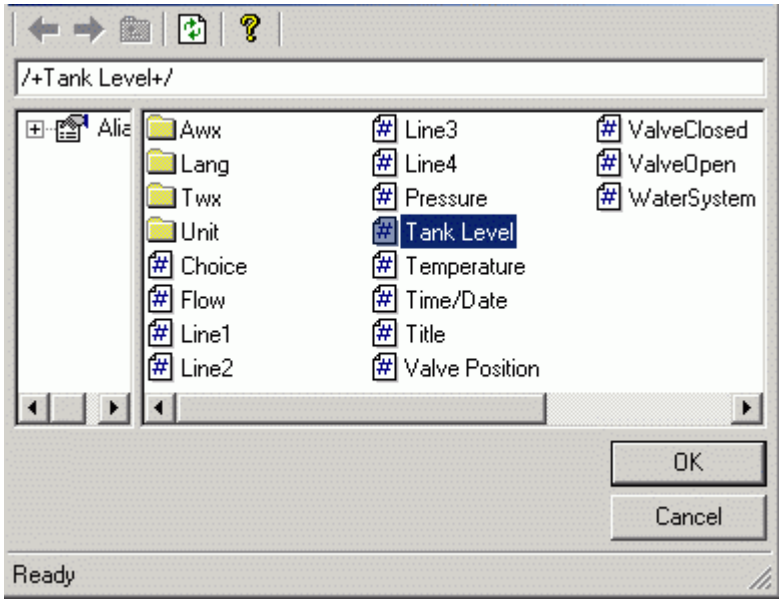
Selecting an Alarm and Events Server From the OPC Universal Tag Browser

You can also select global aliases to use in the **Node** field. Clicking the **...** button and selecting **Global Alias Browser** from the pop-up menu opens the Global Alias Browser, as shown in the figure below. Select a global alias from the Global Alias Browser, which includes all global aliases in the global alias database. This eliminates the need to manually type in the alias name. All global aliases that are configured in the Global Alias Engine Configurator are conveniently available to choose from inside the browser. The tree control of the Global Alias Engine Configurator is mimicked in the tree control of the Global Alias Browser. Select a global alias by double-clicking the alias name (e.g. "Floor" in the figure below). The alias name appears at the top of the browser, which automatically adds the <# and #> delimiters to the alias name. Click the **OK** button.



Selecting an Alias From the Global Alias Browser

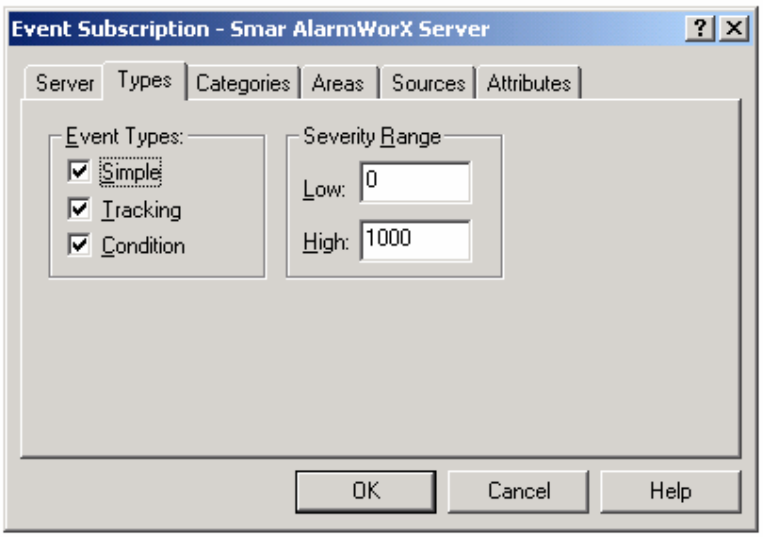
Clicking the **...** button and selecting **Language Alias Browser** from the pop-up menu opens the Language Alias Browser, as shown in the figure below. The browser includes all languages aliases in the language database. All language aliases that are configured in the Language Configurator are conveniently available to choose from inside the browser. The tree control of the Language Configurator is mimicked in the tree control of the Language Alias Browser. Select a language alias by double-clicking the alias name. The alias name appears at the top of the browser, which automatically adds the /+ and +/ delimiters to the alias name. Click the **OK** button.



Selecting an Alias From the Language Alias Browser

Types

The **Types** tab of the **Event Subscription** dialog box, shown in the figure below, allows you to configure which OPC-defined event types each subscription should have, as well as to set the ranges for severity (priority). A value of "0" represents the low severity value, and "1000" represents the high severity value. Please note that OPC Alarm and Event (AE) servers are required to scale severity values to the OPC ranges (i.e. an AE server that contained two severity ranges would convert these to "0" and "1000").



Event Subscription Dialog Box: Types Tab

Simple: These messages state information but do not have alarm status, nor do they contain information on what initiated the message. This includes the following information: Source, Time, Type, EventCategory, Severity, Message, Cookie, and server-specific items.

Example: "FIC101, 12:0:0 1/1/99, Simple, Category1, 100, 'Shift Change', 1"

Simple messages would be similar to an event.

Tracking: These messages contain the additional information of the client that initiated the event. This includes the following information: Source, Time, Type, EventCategory, Severity, Message, Cookie, ActorID, and server-specific items.

Example: "FIC101, 12:0:1 1/1/99, Tracking, Category1, 300, 'Pump pressure Set to 10 psi', 1, Station 12"

Tracking messages are similar to event messages in that the cause of the event is important. An example would be an operator changing a setpoint value. This type of message does not include acknowledge capability.

Note: Simple and tracking messages are removed from the alarm viewer via the acknowledge mechanism.

Condition: These messages contain all of the above information but also include an acknowledgement portion. This includes the following information: Source, Time, Type, EventCategory, Severity, Message, Cookie, ConditionName, SubConditionName, ChangeMask, NewState, ConditionQuality, AckRequired, ActiveTime, ActorID and server-specific items.

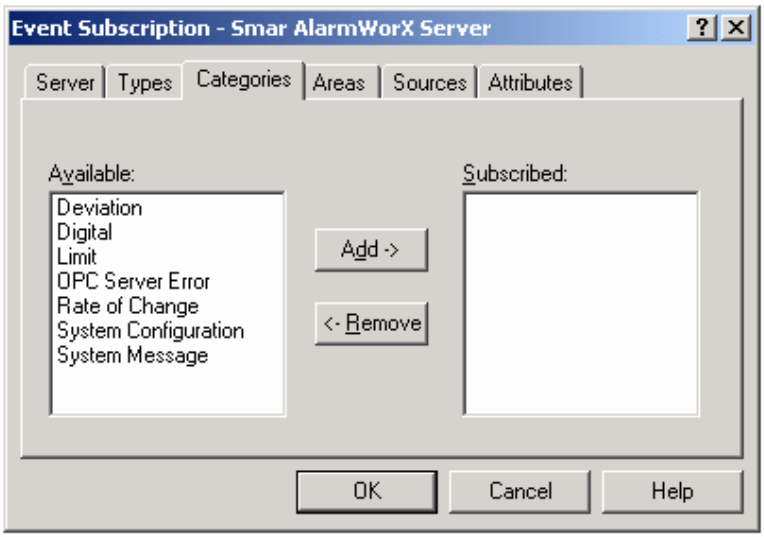
Example: "FIC101, 12:0:3 1/1/99, Condition, Category1, 700, 'Pump pressure to high', 1, Limit, HiHi, 1,Active Enabled, Good, TRUE, 12:0:2 1/1/99"

Condition messages would be considered a "typical" alarm message with acknowledge capability.

For further details on any of the included information, please refer to the OPC Alarm and Events specification.

Categories

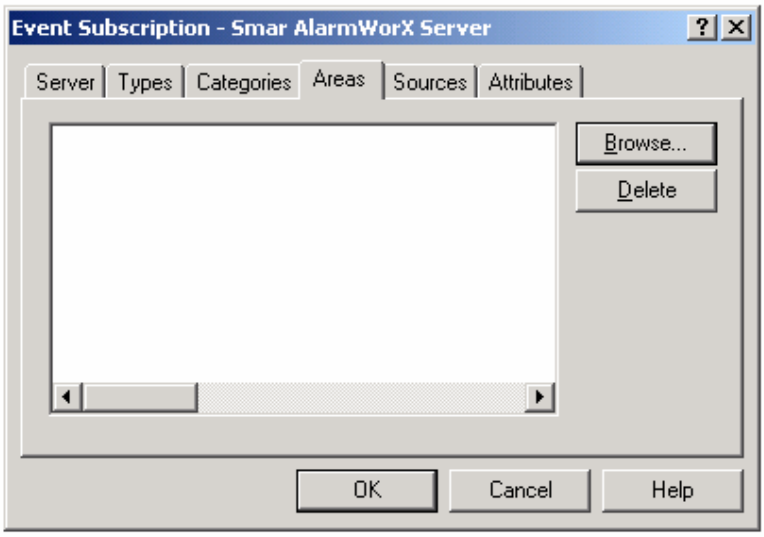
The **Categories** tab of the **Event Subscription** dialog box, shown in the figure below, allows you to select the categories for a subscription. Select the category from the list of available categories, and then click the **Add ->** button. The category will appear in the **Subscribed** list. To remove a category from this list, select it in the **Subscribed** list and click the **<- Remove** button. If no categories are listed in the **Subscribed** list, then all categories are selected by default.



Event Subscription Dialog Box: Categories Tab

Areas

Use the **Areas** tab of the **Event Subscription** dialog box, shown in the figure below, to select an area or a group of areas for filtering in a subscription.



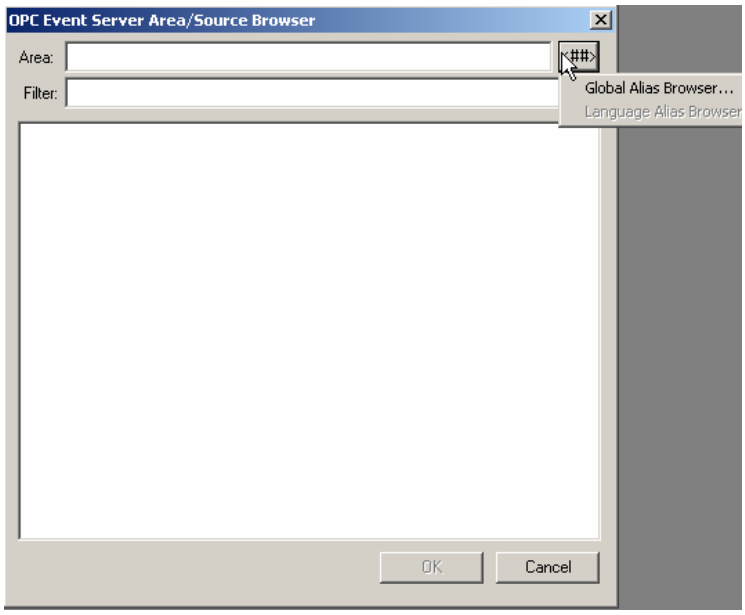
Event Subscription Dialog Box: Areas Tab

Clicking the **Browse** button opens the **OPC Event Server Area / Source Browser,** shown in the figure below, which lists all available areas for your event server. Area subscription supports wildcards, which subscribe to the format of the Microsoft Visual Basic 'like" command. For example, "Area1*" will subscribe to all alarm areas that contain strings beginning with "Area1". "Area1*" will subscribe to the root area and its "child" areas. A detailed explanation of the wildcard support can be found in the OPC Alarm and Events documentation. It is recommended that you thoroughly read the wildcard documentation before attempting to use complicated expressions.

It is also possible to delete an area from the **Areas** tab. To delete an area, select it from the list of areas for this particular subscription, and then click the **Delete** button. Not all OPC Alarm and Event servers support area filtering as part of the subscription.

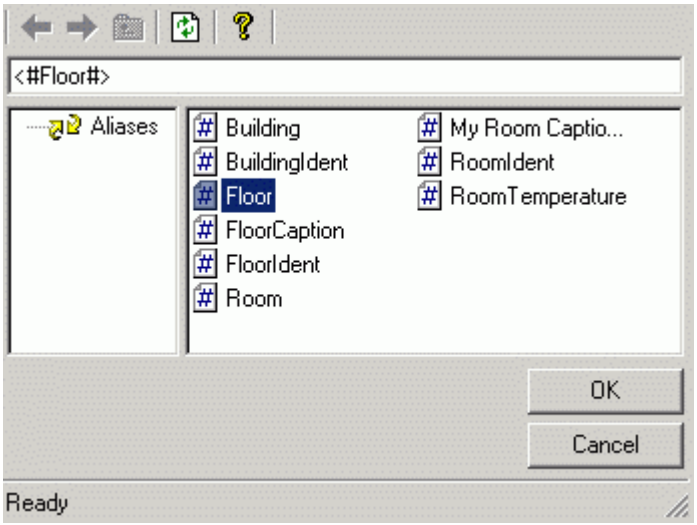
Note: If no areas are listed, then all areas are selected by default.

Note: It is recommended that you have an area in the alarm server to which you subscribe; this ensures that the relevant multimedia alarms are received.



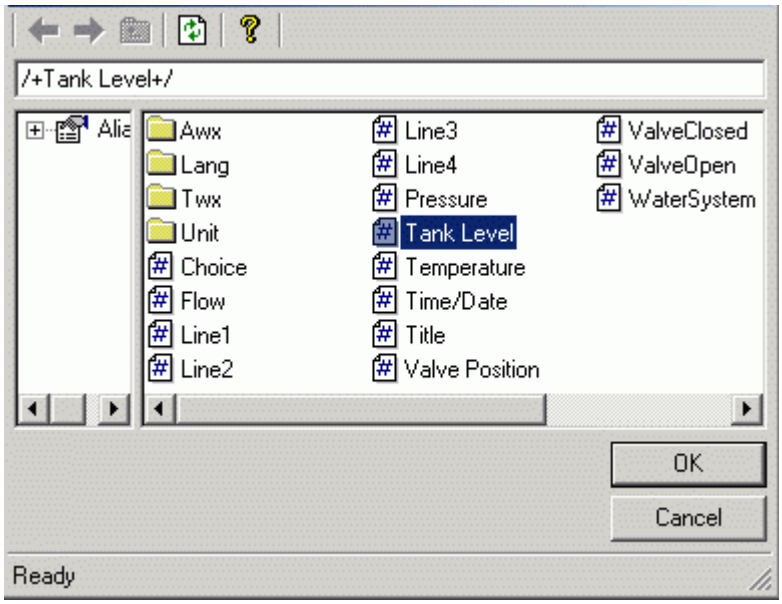
OPC Event Server Area/Source Browser

You can also select global aliases to use in the **Area** field. Clicking the **...** button and selecting **Global Alias Browser** from the pop-up menu opens the Global Alias Browser, as shown in the figure below. Select a global alias from the Global Alias Browser, which includes all global aliases in the global alias database. This eliminates the need to manually type in the alias name. All global aliases that are configured in the Global Alias Engine Configurator are conveniently available to choose from inside the browser. The tree control of the Global Alias Engine Configurator is mimicked in the tree control of the Global Alias Browser. Select a global alias by double-clicking the alias name (e.g. "Floor" in the figure below). The alias name appears at the top of the browser, which automatically adds the <# and #> delimiters to the alias name. Click the **OK** button.



Selecting an Alias From the Global Alias Browser

Clicking the **...** button and selecting **Language Alias Browser** from the pop-up menu opens the Language Alias Browser, as shown in the figure below. The browser includes all languages aliases in the language database. All language aliases that are configured in the Language Configurator are conveniently available to choose from inside the browser. The tree control of the Language Configurator is mimicked in the tree control of the Language Alias Browser. Select a language alias by double-clicking the alias name. The alias name appears at the top of the browser, which automatically adds the /+ and +/ delimiters to the alias name. Click the **OK** button.

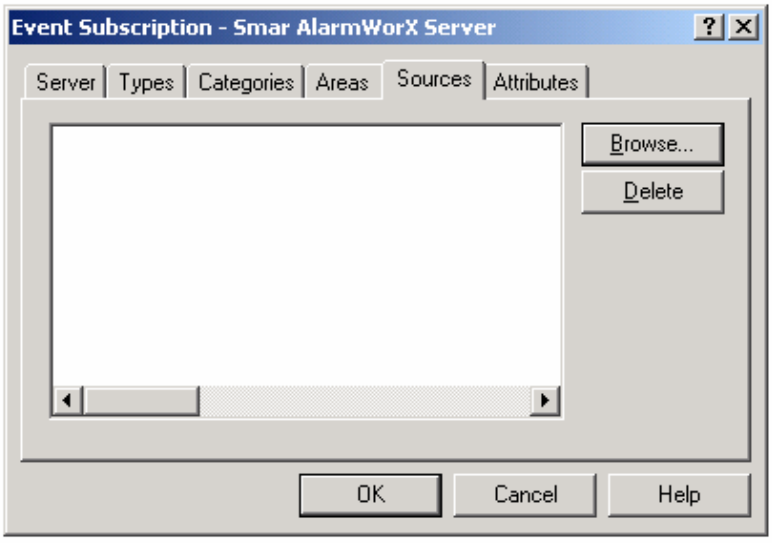


Selecting an Alias From the Language Alias Browser

Sources

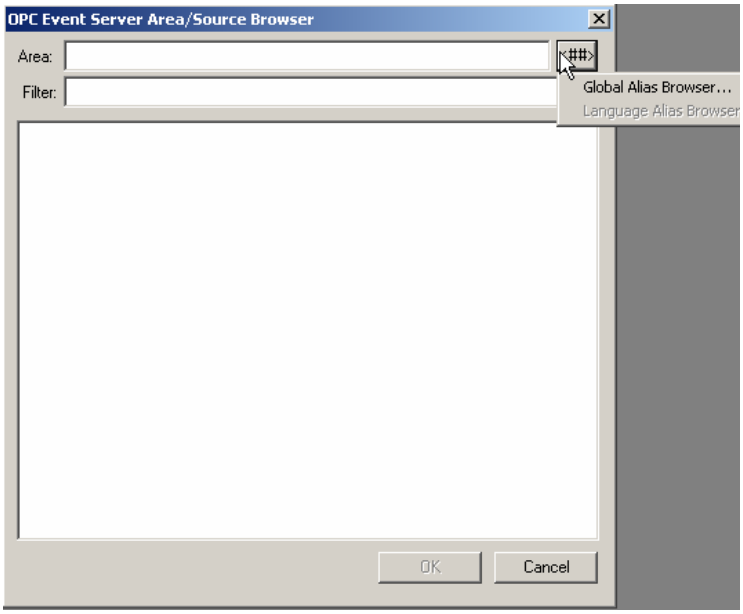
The **Sources** tab of the **Event Subscription** dialog box, shown in the figure below, allows you to filter on a source or group of sources for a particular subscription. It is also possible to delete a source for a particular subscription. To delete a source, select it from the list of sources for this particular subscription and click the **Delete** button. Not all OPC Alarm and Event servers support source filtering as part of the subscription.

Note: If no sources are listed, then all sources are selected by default.



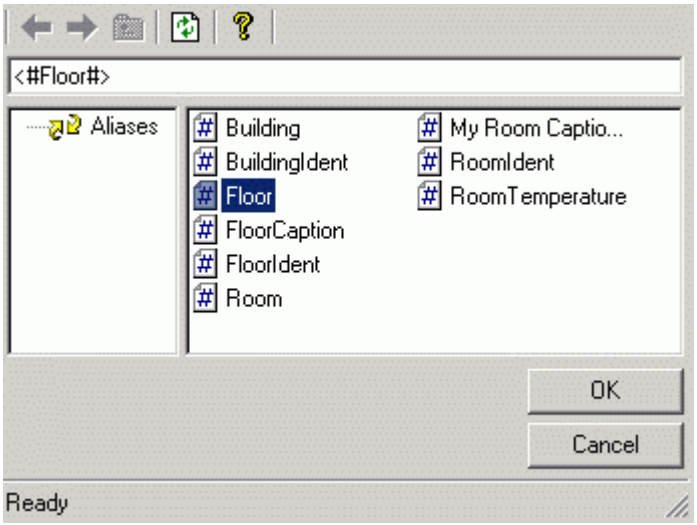
Event Subscription Dialog Box: Sources Tab

To select a source, click the **Browse** button and select one from the **OPC Event Server Area / Source Browser,** shown in the figure below. Source subscription provides the wildcard support found in the area subscription.



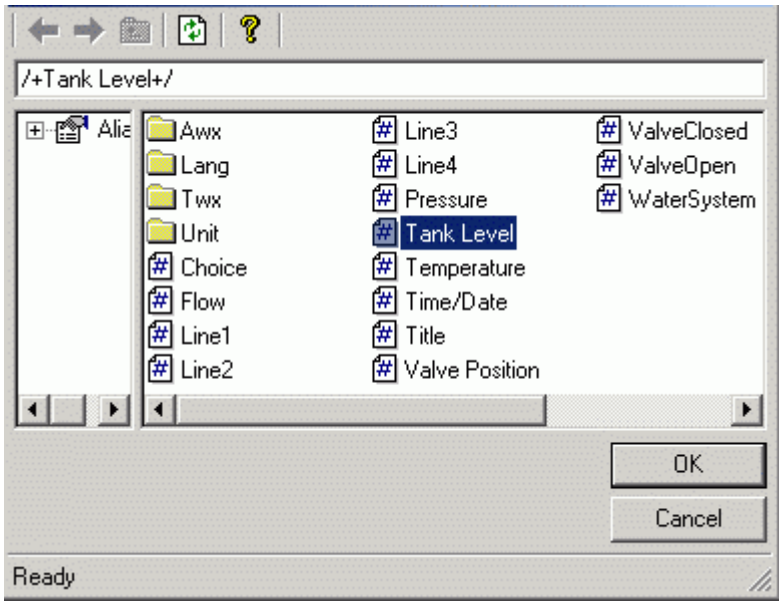
OPC Event Server Area/Source Browser

You can also select global aliases to use in the **Area** field. Clicking the **...** button and selecting **Global Alias Browser** from the pop-up menu opens the Global Alias Browser, as shown in the figure below. Select a global alias from the Global Alias Browser, which includes all global aliases in the global alias database. This eliminates the need to manually type in the alias name. All global aliases that are configured in the Global Alias Engine Configurator are conveniently available to choose from inside the browser. The tree control of the Global Alias Engine Configurator is mimicked in the tree control of the Global Alias Browser. Select a global alias by double-clicking the alias name (e.g. "Floor" in the figure below). The alias name appears at the top of the browser, which automatically adds the <# and #> delimiters to the alias name. Click the **OK** button.



Selecting an Alias From the Global Alias Browser

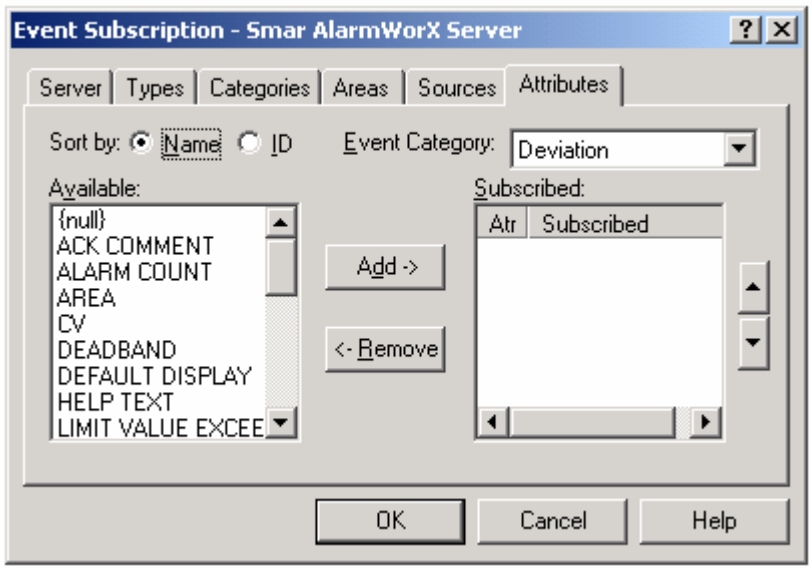
Clicking the **...** button and selecting **Language Alias Browser** from the pop-up menu opens the Language Alias Browser, as shown in the figure below. The browser includes all languages aliases in the language database. All language aliases that are configured in the Language Configurator are conveniently available to choose from inside the browser. The tree control of the Language Configurator is mimicked in the tree control of the Language Alias Browser. Select a language alias by double-clicking the alias name. The alias name appears at the top of the browser, which automatically adds the /+ and +/ delimiters to the alias name. Click the **OK** button.



Selecting an Alias From the Language Alias Browser

Attributes

The **Attributes** tab of the **Event Subscription** dialog box, shown in the figure below, allows you to add extra attributes to a particular event category within a subscription. Select the event category from the corresponding drop-down list. Choose the desired items from the available attributes list, and click the **Add** button. To remove an attribute from the subscribed list, select that particular attribute and click **Remove.**



Event Subscription Dialog Box: Attributes Tab

It is important to note that the order of the subscribed attributes does matter. The order of the attributes determines the order they will be selected from the server, and also determines with which viewer attribute column they are associated. To change the order of the attributes in the subscribed field, simply select an attribute and click the "up" and "down" arrow buttons. Server-specific information will be displayed in the Attributes1-n columns. The attributes columns are added in the **Column** tab of the **Smar AlarmWorX Viewer Properties** dialog box.

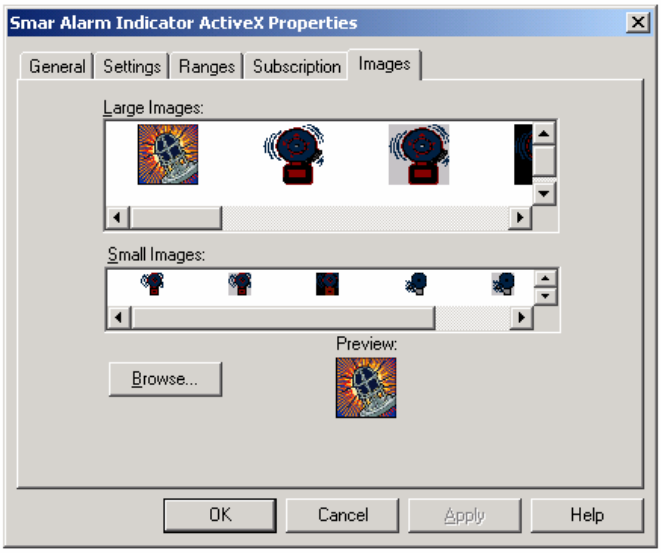
Note: To receive extra attributes, you must request them per event category.

Images Tab

The **Images** tab of the **AlarmWorX Indicator ActiveX Properties** dialog box, shown below, allows you to choose which image to use for the Alarm Indicator ActiveX. For your convenience, the Alarm Indicator provides several default large and small images to use for the ActiveX. The small images are particularly well-suited for placement of the Indicator in an area of your display where space is limited, such as the Windows taskbar.

Alternatively, you can select your own images to use for the Alarm Indicator by clicking the **Browse** button. This opens a dialog box that allows you to select .gif, .jpg, or .bmp image files.

Note: Although you are free to use your own images for the Alarm Indicator, it is recommended that you use the default images provided because the default images contain predefined flashing regions. If you use your own images, you will have to manually specify the flashing regions for the images.



Smar Alarm Indicator ActiveX Control Properties: Images Tab

Runtime Functions

When you have finished configuring the AlarmWorX Indicator ActiveX, you are ready to enter the Alarm Indicator into runtime mode. During runtime mode, the Alarm Indicator notifies you of alarms that are occurring in your ProcessView system by flashing and making sounds based on the color, sound, flashing, and severity parameters that you have set in your configuration.

To enter the ActiveX display into runtime mode from the AlarmWorX or TrendWorX container applications, select **Runtime Mode** from the **Actions** menu. To enter the display into runtime mode from GraphWorX, click **Runtime** on the menu bar.

ToolTips

When you place the mouse pointer over the Alarm Indicator ActiveX during runtime mode, you can view the ToolTip that you specified in the **General** configuration tab. In the example below, the text "Control Room" appears in the ToolTip during runtime mode.

Viewing the ToolTip in Runtime

Colors, Flashing and Sounds

When an alarm is triggered during runtime mode, the Alarm Indicator ActiveX will flash repeatedly to visually indicate the alarm. The normal color (no alarm) and the replacement (flashing alarm) color have been specified the **Settings** configuration tab. In the example below, the Alarm Indicator is flashing red to indicate that an alarm is occurring.

Alarm Occurring in Runtime

When an alarm occurs during runtime, the Alarm Indicator flashes and/or sounds according to the parameters that have been set in the **Ranges** configuration tab, in which the colors, flash period, and sound period have been specified for the Alarm Indicator. The sound, color, and flashing of the Alarm Indicator during runtime vary depending on the severity range of each alarm. The severity ranges have been specified in the **Severity Range Configuration** dialog box.

Each severity range has a different configuration, so the Alarm Indicator may look and sound different for each occurring alarm. For example, the following configuration might be used. For each alarm that occurs in the severity range 100-199, the Alarm Indicator will beep once every two seconds and flash blue once every two seconds. For each alarm that occurs in the severity range 200-299, the Alarm Indicator will sound a horn one time per second and flash red one time per second.

Note: Flashing and sound will occur for unacknowledged alarms in order of priority from the highest severity level to the lowest severity level.

Launching an Application During Runtime

You can launch an application from the Alarm Indicator ActiveX during runtime mode. The type of application, the application file, and the method for launching the application have already been specified in the **Settings** configuration tab. Launch the application using the method you selected in the configuration (single-click, double-click, or right-click context menu). For example, suppose you have configured the Alarm Indicator to launch a document when the Alarm Indicator is right-clicked during runtime mode. In runtime mode, right-click the Indicator ActiveX, and then select **Launch Doc** from the pop-up menu, as shown below.

Launching an Application During Runtime

Turning off the Sound During Runtime

If you have configured the Alarm Indicator to make a sound when an alarm is indicated, you can turn off the sound during runtime mode using the sound suppression feature. The sound suppression period is specified in the **Settings** configuration tab. Turn off the sound using the method you selected in the configuration (single-click, double-click, or right-click context menu). For example, suppose you have configured the Alarm Indicator to suppress the sound when the Alarm Indicator is right-clicked during runtime mode. In runtime mode, right-click the Indicator ActiveX, and then select **Suppress Sound** from the pop-up menu, as shown below. The sound will be suppressed for the duration of the sound-suppression period specified in the configuration. When the sound-suppression period has elapsed, the Alarm Indicator will resume making the sound.

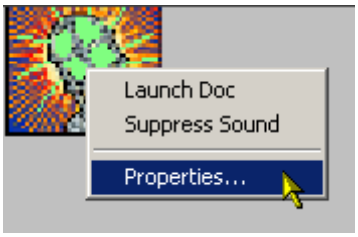
Turning off the Sound During Runtime

Global Sound Suppression

If multiple instances of the Alarm Indicator ActiveX are running concurrently and each instance is configured to produce a sound indicating an alarm, you can use the global sound suppression function to monitor the sound status of all instances. For example, suppose you have two Alarm Indicators open (Alarm Indicator 1 and Alarm Indicator 2). If Alarm Indicator 1 sounds an alarm, and global sound suppression is enabled in the **Settings** configuration tab, the sound of Alarm Indicator 2 will be temporarily suppressed until Alarm Indicator 1 stops making a sound.

Changing Properties During Runtime

During runtime mode, you can quickly and easily access the Alarm Indicator ActiveX Properties configuration dialog box by right-clicking the Alarm Indicator and selecting **Properties** from the pop-up menu, as shown below.



Accessing Configuration Properties During Runtime

Automation Interfaces

The AlarmWorX Indicator ActiveX provides a COM interface that allows external programs to manipulate the indicator as it is running. The interface is available to all programming languages that support COM including Visual Basic (VB), Visual Basic for Applications (VBA) and Microsoft Visual C^{++}.

To access the Automation interface from VB and VBA, AlarmWorX Indicator must be made available by choosing **Project - References** from the main menu in the VB or VBA development environment and selecting **AwxInd 1.0 Type Library** in the list of available references.

Available Control Properties

Members of 'AwxIndicator':

OLE_COLOR BackColor

Description

This is the "replacement" color of the Alarm Indicator. It is the color that you see behind the flashing color when there are alarms coming in. Property is read/write.

Remarks

Please note, the replacement color can only be a valid color that already exists in the bitmap, otherwise you will not see any change.

OLE_COLORs can be set in more than one way. You can use a VB color constant such as vbWhite, an RGB color value, or a Long integer.

Example

This example shows how to read and write the background color.

```
Dim backColor As Long
backColor = AwxIndicator1.BackColor
AwxIndicator1.BackColor = 16777215
'Or:
AwxIndicator1.BackColor = vbWhite
'Or:
AwxIndicator1.BackColor = RGB(255, 255, 255)
'(All examples make the background color white)
```

boolean CanUserConfigure

Description

True if configuration is enabled for the currently logged in user. Property is read-only.

Example

This example shows how to determine if user configuration is enabled.

```
MsgBox AwxIndicator1.CanUserConfigure
```

boolean CanUserLaunchDoc

Description

True if launching a document is enabled for the currently logged in user. Property is read-only.

Example

This example shows how to determine if launching a document is enabled.

```
MsgBox AwxIndicator1.CanUserLaunchDoc
```

boolean CanUserSuppressSound

Description

True if sound suppression is enabled for the currently logged in user. Property is read-only.

Example

This example shows how to determine if sound suppression is enabled.

```
MsgBox AwxIndicator1.CanUserSuppressSound
```

string Caption

Description

This is the text that appears when you hover over the Alarm Indicator with your mouse. Property is read/write.

Example

This example shows how to read and write the caption.

```
Dim caption As String
caption = AwxIndicator1.Caption
AwxIndicator1.Caption = “My Caption”
```

boolean FileEnabled

Description

True if a configuration file is enabled. Property is read/write.

Example

This example shows how to determine if a configuration file is enabled.

```
Dim bEnabled As Boolean
bEnabled = AwxIndicator1.FileEnabled
```

This example shows how to turn on/off a configuration file.

```
AwxIndicator1.FileEnabled = True
```

string FileName

Description

This is the name of the configuration file. Property is read/write.

Remarks

Use this property to load and save configuration files. First set the property to the correct path and file name, and then call either FileLoad() or FileSave().

Example

This example shows how to read and write the configuration file name.

```
Dim fileName As String
fileName = AwxIndicator1.FileName
AwxIndicator1.FileName = “C:\My Directory\AwxIndCfg.awi”
```

OLE_COLOR FillColor

Description

This is the “normal” color of the Alarm Indicator. It is the color that flashes when there are no alarms coming in. This can be any color. Property is read/write.

Remarks

OLE_COLORs can be set in more than one way. You can use a VB color constant such as vbWhite, an RGB color value, or a Long integer.

Example

This example shows how to read and write the fill color.

```
Dim fillColor As Long
fillColor = AwxIndicator1.FillColor
AwxIndicator1.FillColor = 16777215
```

'Or:
AwxIndicator1.FillColor = vbWhite
'Or:
AwxIndicator1.FillColor = RGB(255, 255, 255)
'(All make the fill color white)

boolean GlobalSoundSuppression

Description

True if global sound suppression is enabled. Property is read/write.

Example

This example shows how to determine if global sound suppression is enabled.

```
Dim bEnabled As Boolean
bEnabled = AwxIndicator1.GlobalSoundSuppression
```

This example shows how to turn on/off global sound suppression.

```
AwxIndicator1.GlobalSoundSuppression = True
```

string LaunchDoc

Description

This is the file name of the Word document to be launched from the Alarm Indicator. Property is read/write.

Example

This example shows how to read and write the launch document file name.

```
Dim launchDoc As String
launchDoc = AwxIndicator1.LaunchDoc
AwxIndicator1.LaunchDoc = "C:\My Directory\MyWordDoc.doc"
```

tagINVOKE_VIA LaunchDocVia

Description

This property corresponds to a constant that determines which method can be used to launch a document. Property is read/write.

Remarks

The tagINVOKE_VIA constant values are:

SingleClick = 1
DoubleClick = 2
ContextMenu = 3

Example

This example shows how to read and write the document launching method.

```
Dim n As tagINVOKE_VIA
n = AwxIndicator1.LaunchDocVia
AwxIndicator1.LaunchDocVia = ContextMenu
```

IPictureDisp Picture

Description

This is the bitmap object that is displayed on the Alarm Indicator.

Example

This example shows how to grab the Picture object.

```
Dim pic As IPictureDisp
Set pic = AwxIndicator1.Picture
```

object RangeCollection

Description

This object returns a RangeCollection, which is a collection of Range objects that determine the Alarm Indicator's color depending on the severity of the alarm. There is only one RangeCollection per Alarm Indicator instance; however, there can be many Range objects in each RangeCollection.

Remarks

The RangeCollection object has 3 properties and 2 methods:

```
Clone As Object
Count As Long
Item As Object
AddItem(NewItem As Object)
DeleteItem(ToDelete As Object)
```

Example

This example shows how to grab the RangeCollection object.

```
Dim rc As RangeCollection
Set rc = AwxIndicator1.RangeCollection
```

long SuppressSoundPeriod

Description

This specifies the number of seconds the sound will be suppressed when you invoke the "Suppress Sound" action. Property is read/write.

Example

This example shows how to read and write the sound suppression period.

```
Dim n As Long
n = AwxIndicator1.SuppressSoundPeriod
AwxIndicator1. SuppressSoundPeriod = n + 1
```

tagINVOKE_VIA SuppressSoundVia

Description

This property corresponds to a constant that determines which method can be used to suppress a sound.

Remarks

The tagINVOKE_VIA constant values are:

```
SingleClick = 1
DoubleClick = 2
ContextMenu = 3
```

Example

This example shows how to read and write the sound suppression method.

```
Dim n As tagINVOKE_VIA
n = AwxIndicator1.SuppressSoundVia
AwxIndicator1. SuppressSoundVia = SingleClick
```

string URLPath

Description

This specifies the URL path of a configuration file. Property is read/write.

Example

This example shows how to read and write the URL path.

```
Dim path As String
path = AwxIndicator1.URLPath
AwxIndicator1.URLPath = "http://www.smar.com/awxindcfg.awi"
```

Members of 'Range':

object Clone

Description

This is a copy of the Range object. Property is read-only.

Example

This example shows how to grab a copy of the Range object.

```
Dim range As Range
range = AwxIndicator1.RangeCollection.Item(0).Clone
```

long Color

Description

This is the color that will flash when alarms within this particular severity range are coming in. Property is read/write.

Remarks

This property accepts all valid OLE_COLORs.

Example

This example shows how to read and write the range color.

```
Dim color As Long
color = AwxIndicator1.RangeCollection.Item(0).Color
AwxIndicator1.RangeCollection.Item(0).Color = 16777215
'Or:
AwxIndicator1.RangeCollection.Item(0).Color = vbWhite
'Or:
AwxIndicator1.RangeCollection.Item(0).Color = RGB(255, 255, 255)
'(All make the range's color white)
```

long FlashPeriod

Description

This is the duration (in milliseconds) of each flash for that particular severity range. Property is read/write.

Example

This example shows how to read and write the flash period.

```
Dim n As Long
n = AwxIndicator1.RangeCollection.Item(0).FlashPeriod
AwxIndicator1.RangeCollection.Item(0).FlashPeriod = 200
```

boolean IsWav

Description

Returns true if the current Range object has a valid file associated with it. Returns false if it cannot locate the file on the system.

Example

This example shows how to read the IsWav property.

```
Dim bEnabled As Boolean
bEnabled = AwxIndicator1.RangeCollection.Item(0).IsWav
```

long PlayPeriod

Description

This specifies the number of milliseconds between each time the .wav file is played. Property is read/write.

Remarks

If the .wav file that you are using is longer than the play period, the sound will not cut off; it will immediately restart once the .wav file is done playing.

Example

This example shows how to read and write the play period.

```
Dim n As Long
n = AwxIndicator1.RangeCollection.Item(0).PlayPeriod
AwxIndicator1.RangeCollection.Item(0).PlayPeriod = 10000
```

long Severity

Description

This is the severity level of the current range object. Property is read/write.

Remarks

If you change the severity level of a range to be lower than the severity level of any ranges below it, it will delete those ranges and your current range will encompass the entire severity level of the previous ranges combined. It will never create a brand new severity level.

Example

This example shows how to read and write the severity level.

```
Dim n As Long
n = AwxIndicator1.RangeCollection.Item(0).Severity
AwxIndicator1.RangeCollection.Item(0).Severity = 500
```

string WavFileName

Description

This is a property that you set before loading or playing a .wav file for a particular range. Property is read/write.

Remarks

Use this property to load and play .wav files. First set the property to the correct path and file name, and then call either LoadWavFile() or PlayWav().

Example

This example shows how to read and write the .wav file name.

```
Dim wavFile As String
wavFile = AwxIndicator1.RangeCollection.Item(0).WavFileName
AwxIndicator1.RangeCollection.Item(0).WavFileName = “C:\wav_file.wav”
```

Members of ‘RangeCollection’:

object Clone

Description

This is a copy of the RangeCollection object. Property is read-only.

Example

This example shows how to grab a copy of the RangeCollection object.

```
Dim rc As RangeCollection
rc = AwxIndicator1.RangeCollection.Clone
```

long Count

Description

This is the number of Range objects in the RangeCollection. (Read-only).

Example

This example shows how to read the count.

```
Dim n As Long
n = AwxIndicator1.RangeCollection.Count
```

object Item

Description

This corresponds to each Range object within the RangeCollection. Item is an array of objects. Property is read-only.

Remarks

The Item array corresponds to the Range objects in reverse order (or by decreasing severity). The first array index is 0 and it goes up to the RangeCollection Count – 1.

Example

This example shows how to grab a Range object from the RangeCollection Item array.

```
Dim r As Range
Set r = AwxIndicator1.RangeCollection.Item(0)
‘This grabs the Range object of highest severity
```

Available Control Methods

Members of 'AwxIndicator':

void DoContextMenu()

Description

Launches the context menu so that a user can then click on an option.

Example

This example shows how to launch the context menu.

```
AwxIndicator1.DoContextMenu
```

void DoLaunchDoc()

Description

Launches the document specified in the LaunchDoc property.

Example

This example shows how to perform the LaunchDoc action.

```
AwxIndicator1.DoLaunchDoc
```

void DoLeftMouseButton()

Description

Simulates a left mouse button click, thus performing whichever action (if any) is associated with the left mouse button.

Example

This example shows how to simulate a left mouse button click.

```
AwxIndicator1.DoLeftMouseButton
```

void DoLeftMouseDoubleClick()

Description

Simulates a left mouse button double-click, thus performing whichever action (if any) is associated with double-clicking the left mouse button.

Example

This example shows how to simulate a left mouse button double-click.

```
AwxIndicator1.DoLeftMouseDoubleClick
```

void DoSuppressSound()

Description

Performs the sound suppression action. This will silence the Alarm Indicator for the number of seconds specified in the SoundSuppressionPeriod property.

Example

This example shows how to suppress the sound.

```
AwxIndicator1.DoSuppressSound
```

void FileLoad()

Description

Loads the configuration file that is currently in the FileName property.

Remarks

You must set the FileName property and make sure that FileEnabled is set to “True” before calling this method or it will have no effect.

Example

This example shows how to load a configuration file.

```
AwxIndicator1.FileName = “C:\My Directory\AwxIndCfg.awi”
AwxIndicator1.FileEnabled = True
AwxIndicator1.FileLoad
‘Loads the file AwxIndCfg.awi
```

void FileSave()

Description

Saves the configuration file that is currently in the FileName property.

Remarks

You must set the FileName property and make sure that FileEnabled is set to “True” before calling this method or it will have no effect.

Example

This example shows how to save a configuration file.

```
AwxIndicator1.FileName = “C:\My Directory\AwxIndCfg1.awi”
AwxIndicator1.FileEnabled = True
AwxIndicator1.FileSave
‘Saves the current configuration out to the file AwxIndCfg1.awi
```

void ForceConfigMode(Force As Boolean)

Description

Allows the Alarm Indicator to exit runtime and enter configuration mode while the container remains in runtime mode.

Example

This example shows how to force configuration mode.

```
AwxIndicator1.ForceConfigMode(True)
```

long GetAlarmOleBlob()

void SetAlarmOleBlob(pBlob As Long)

Description

These above two methods are part of AlarmOLE.

long ReplaceFilePath(OldSubstring As String, NewSubstring As String)

Description

Works over path name parameters of pick dynamics. Returns 0 on success and HRESULT when something fails.

Example

```
'similar to ReplaceTag
'VBA example, works only in configure mode
'replaces file path in whole display

Dim Status As Long
Status = ThisDisplay.ReplaceFilePath("C:\Windows\Temp", "D:\Temp")
'if Status <> 0 then there was no replacement performed or an
error occurs
If Status <> 0 Then
 MsgBox "No replacements"
Else
 MsgBox "Tags replaced"
End If
```

long ReplaceHost(OldHostName As String, NewHostName As String)

Description

Works over both data source tags and path name attributes and replaces node name **substring** within URL path only. Returns 0 on success and HRESULT when something fails.

Example

```
'similar to ReplaceTag
'VBA example, works only in configure mode
'replaces host name in whole display

Dim Status As Long
Status = ThisDisplay.ReplaceHost("Host1", "Host2")
'if Status <> 0 then there was no replacement performed or an
error occurs
If Status <> 0 Then
 MsgBox "No replacements"
Else
 MsgBox "Tags replaced"
End If
```

long ReplaceHost(OldHostNameSubstring As String, NewHostNameSubstring As String, MatchCase As Long, MatchWholeWord As Long)

Description

Works over both data source tags and path name attributes and replaces node name **substring** within URL path only, and supports case-sensitivity, wildcard strings and MatchWholeWord flag. Returns 0 on success and HRESULT when something fails.

Example

```
'similar to ReplaceTag
'VBA example, works only in configure mode
'replaces host name in whole display, regarding "case" and "whole words" options

Dim Status As Long
Status = ThisDisplay.ReplaceHostEx("Host1", "Host2", True, True)
'if Status <> 0 then there was no replacement performed or an error occurs
If Status <> 0 Then
 MsgBox "No replacements"
Else
 MsgBox "Tags replaced"
End If
```

string ReplaceStringInString(StringToReplace As String, OldSubstring As String, NewSubstring As String)

Description

Replaces **OldSubstring** with **NewSubstring** inside (within) StringToReplace. Returns 0 on success and HRESULT when something fails.

long ReplaceTag(OldSubstring As String, NewSubstring As String)

Description

Works over data source tags in dynamic actions of all display objects. Replaces **OldSubstring** with **NewSubstring** in certain situations. Returns 0 on success and HRESULT when something fails.

Typical use of this method:

Example

```
'VBA example, works only in configure mode
'replaces tag name in whole display

Dim Status As Long
Status = ThisDisplay.ReplaceTag("gfwsim.ramp.float", "gfwsim.sine.double")
'if Status <> 0 then there was no replacement
'performed or an error occurs
If Status <> 0 Then
 MsgBox "No replacements"
Else
 MsgBox "Tags replaced"
End If
```

Members of 'Range':

void LoadWavFile()

Description

Sets the .wav file to be played when that specific range is in alarm condition. Uses the .wav file that is currently residing in the WavFileName property.

Remarks

You must set the WavFileName property before calling this method or it may return an error.

Example

This example shows how to load a .wav file.

```
AwxIndicator1.RangeCollection.Item(0).WavFileName = "C:\My Directory\MyWav.wav"
AwxIndicator1.LoadWavFile
'Loads the file MyWav.wav
```

void PlayWav()

Description

Plays the .wav file that is currently residing in the WavFileName property.

Remarks

You must set the WavFileName property before calling this method or it may return an error.

Example

This example shows how to play a .wav file.

```
AwxIndicator1.RangeCollection.Item(0).WavFileName = "C:\My Directory\MyWav.wav"
AwxIndicator1.PlayWav
'Plays the file MyWav.wav
```

Members of 'RangeCollection':

void AddItem(NewItem As Object)

Description

Adds a new item into the RangeCollection of the Alarm Indicator.

Remarks

The easiest way to do this is to clone an already existing Range object and then modify its properties to fit your new Range needs.

Example

This example shows how to clone an existing Range object and add a modified version of it to the RangeCollection.

```
Dim newRange As Range
Set newRange = AwxIndicator1.RangeCollection.Item(0).Clone
newRange.Color = vbBlue
newRange.FlashPeriod = 300
newRange.PlayPeriod = 6000
newRange.Severity = 500
AwxIndicator1.RangeCollection.AddItem(newRange)
```

void DeleteItem(ToDelete As Object)

Chapter 3

Logger Configurator

Introduction

The AlarmWorX Logger provides a permanent copy of alarm and event notifications produced by any OPC Alarm and Events server, including the AlarmWorX Server. The alarm and event data may be stored in an OLE-DB or ODBC database and/or sent to a printer. The logger has been tested with the Microsoft Access (Jet) database and with Microsoft SQL Server.

The Logger Application (AWXLog.exe) that provides the runtime storage and printing has no user interface and may optionally be run as a service on Windows NT. The logger typically reads its configuration information from a Microsoft Access database file.

The Alarm Logger Configurator (AWXLogCfg.exe) is used to make changes to the Microsoft Access Database file that the Logger uses for configuration information.

Installation

The following are the major files that comprise the Logger component of AlarmWorX:

AWXLog.exe	Logger application/service.
AWXLogCfg.exe	Logger Configurator.
AWXLog.mdb	Logger sample configuration database

The files are installed in the Bin directory chosen during the install. Program icons are installed for the Configurator in the AlarmWorX program group.

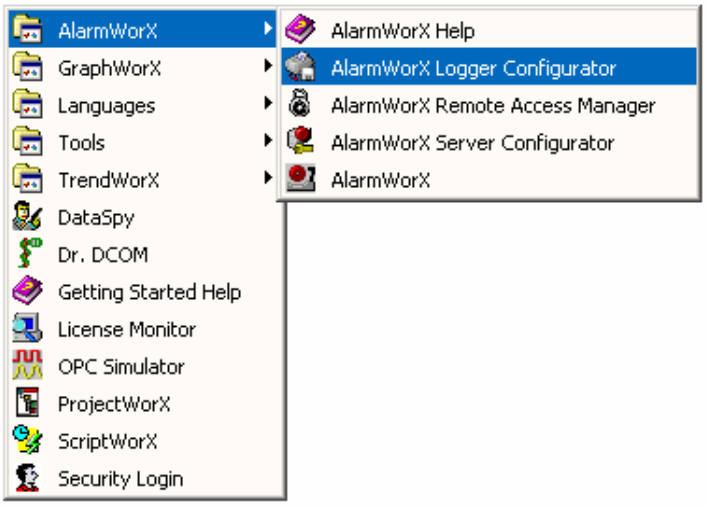
By default the Logger (AwxLog.exe) is registered as a normal application, but can be registered to run as a service under Windows NT. Running as a Service has the following advantages:

- The Logger can be set to start as soon as the machine is powered (before a user has logged on).
- The Logger will remain running even if a user Logs off of NT.

To register the Logger as a Windows NT Service:

1. Run the **ProcessView Tray** utility from the Windows **Start** menu by selecting **Programs > Smar ProcessView- > Tools > ProcessView Tray.**

2. This opens ProcessView Tray and puts the **ProcessView Tray** icon in the taskbar system tray. Click the **ProcessView Tray** icon in the system tray and select **AlarmWorX > Logger > NT Service,** as shown in the figure below. To have the service start automatically upon system startup, click the **ProcessView Tray** icon in the system tray and select **AlarmWorX > Logger > Auto Start.**



Running AlarmWorX Logger From ProcessView Tray

The **ProcessView Tray** utility can also be used to manually start and stop the logger.

Note: The Alarm Logger does not use standard COM rules for activation/deactivation. If the server is started for any reason (via ProcessView Tray or by activation by an OPC Alarm Client), it will remain running until both of the following conditions are met:

- The ProcessView Tray utility has issued the **Stop** command to the Server.
- All OPC alarm clients have disconnected from the server.

Since NT Services are not supported in Windows 95 and Windows 98, ProcessView Tray can be used to facilitate the starting of the Alarm Logger on startup:

3. Place a shortcut to the **ProcessView Tray** utility in the startup group so **ProcessView Tray** will start automatically when Windows 95 or Windows 98 boots up.

4. To have the Alarm Logger start automatically when ProcessView Tray starts, click the **ProcessView Tray** icon in the system tray and select **AlarmWorX > Logger > Auto Start.**

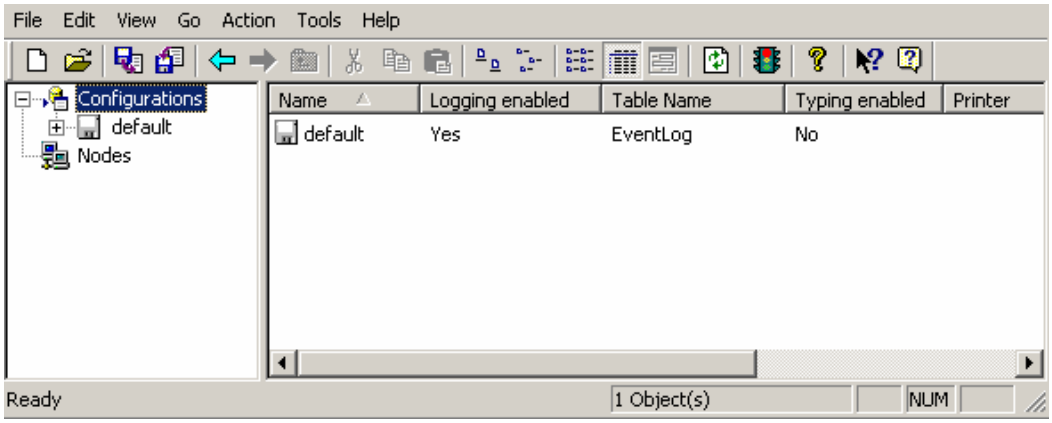
Starting the Alarm Logger Configuration

The AlarmWorX Logger Configurator writes configuration information to a configuration database. This configuration information is read by the AlarmWorX Logger during runtime to determine what alarms and events to log and where to log them. A single database can contain multiple named configurations to be run by one or more nodes on a network. A single node can also run multiple configurations simultaneously.

To launch the AlarmWorX Logger Configurator from the Windows **Start** menu:

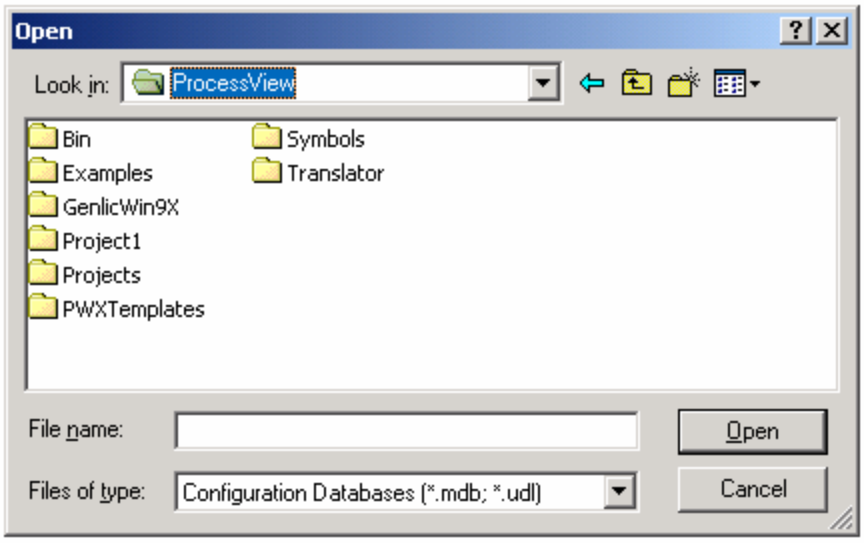
1. Select **Programs > Smar ProcessView- > AlarmWorX > Alarm Logger Configurator.**

2. The **AwxLog.mdb** Microsoft Access database file opens in the Alarm Logger Configurator, as shown in the figure below. The screen consists of a split window with a tree control view in the left-hand pane and a configuration view in the right-hand pane. The Configurator provides a standard format for the configuration database, as well as a sample (default) configuration project. The Configurator also includes a toolbar and menus with many command functions.



Alarm Logger Configurator Screen

3. To open a different database file, select **Open** from the **File** menu. This opens the **Open** dialog box, shown below, which enables you to browse for configuration files.

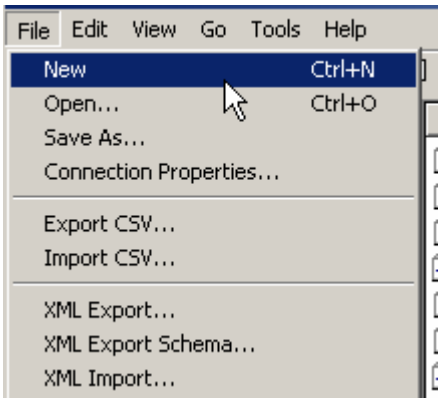


Selecting a Configuration Database

Creating Configuration Databases

The Configurator provides a Configuration Database Wizard for creating new Microsoft Access and SQL Server configuration databases. To create a new configuration database in the Configurator:

1. Select **New** from the **File** menu, as shown in the figure below**.**



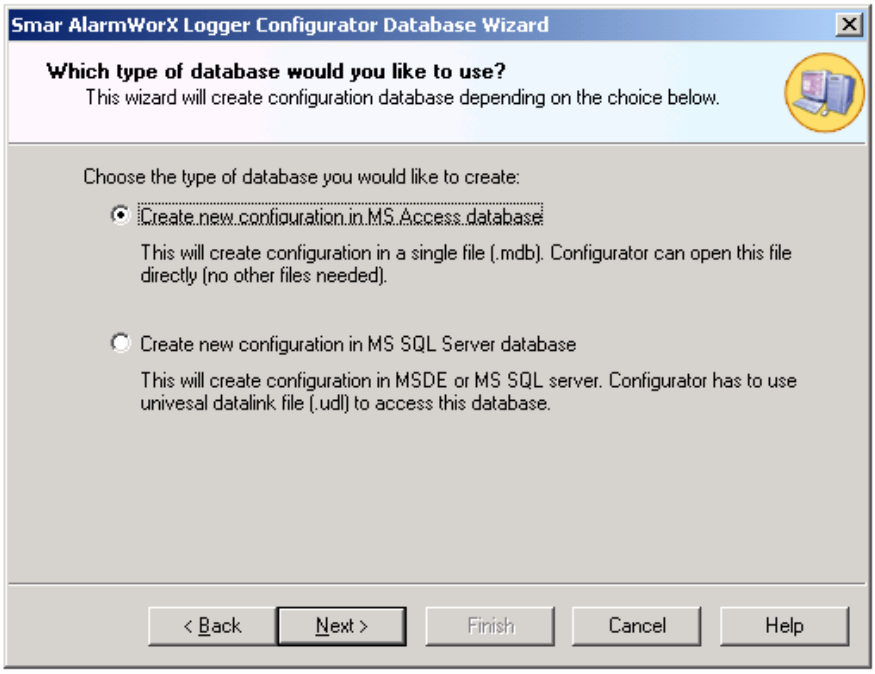
Creating a Configuration Database

2. The introduction screen for the Configuration Database Wizard appears. Click the **Next** button to continue.

3. You have two options for creating your new database, as shown in the figure below:

- **Create a new Microsoft Access configuration database:** For a Microsoft Access database, the Configurator uses a single .mdb file
- **Create a Microsoft SQL Server database:** The Configurator uses Universal Data Link (.udl) files to connect to a Microsoft SQL Server or MSDE database.

Select the database type you want to create, and then click **Next.**

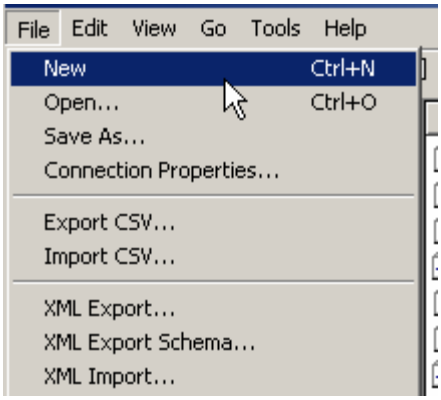


Choosing the Type of Database To Create

Creating a Microsoft Access Configuration Database

To create a new Microsoft Access configuration database in the Configurator:

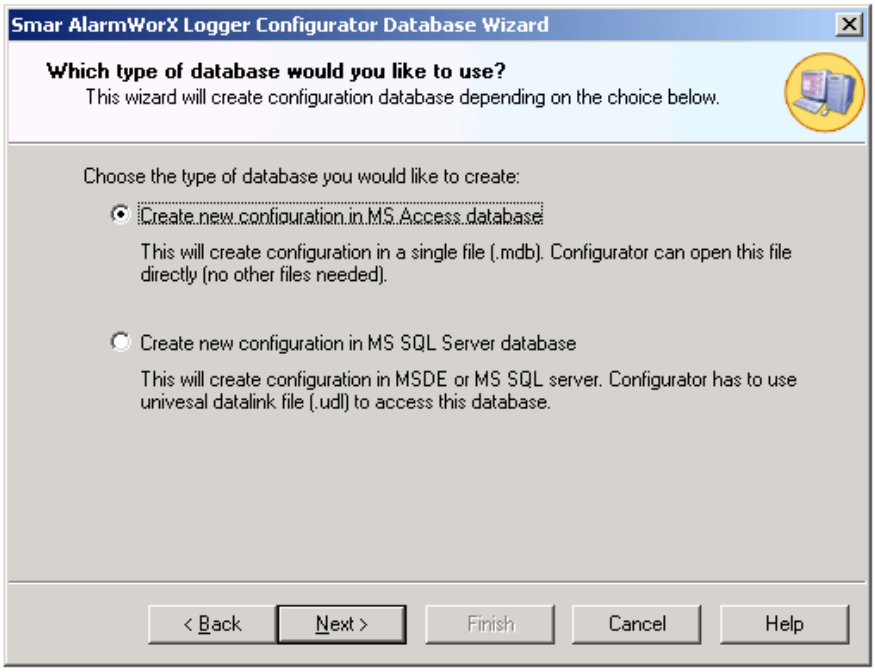
1. Select **New** from the **File** menu, as shown in the figure below**.**



Creating a Configuration Database

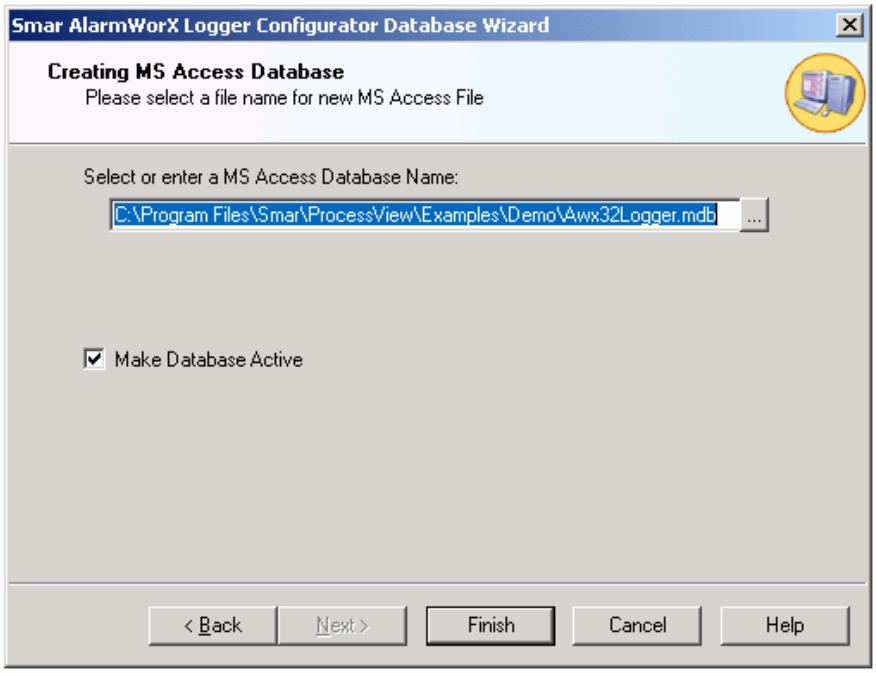
2. The introduction screen for the Configuration Database Wizard appears. Click the **Next** button to continue.

3. You have two options for creating your new database, as shown in the figure below. Select **Create new configuration in MS Access database.** Click the **Next** button to continue.



Creating a New Microsoft Access Database

4. Specify the directory path and file name for the new database, as shown in the figure below. Click the **...** button to browse for a directory. If you want this new database to be the active configuration database, check **Make Database Active.**



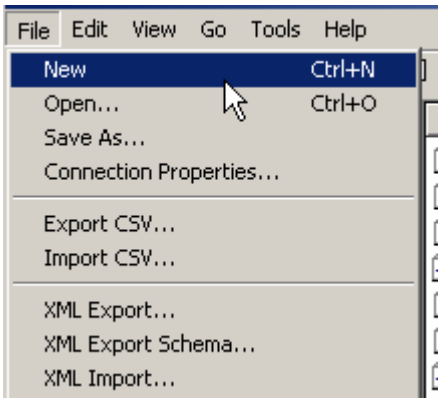
Naming the New Access Database

5. Click the **Finish** button. The new database is created and opened in the Configurator.

Creating a Microsoft SQL Server Configuration Database

To create a new Microsoft SQL Server configuration database in the Configurator:

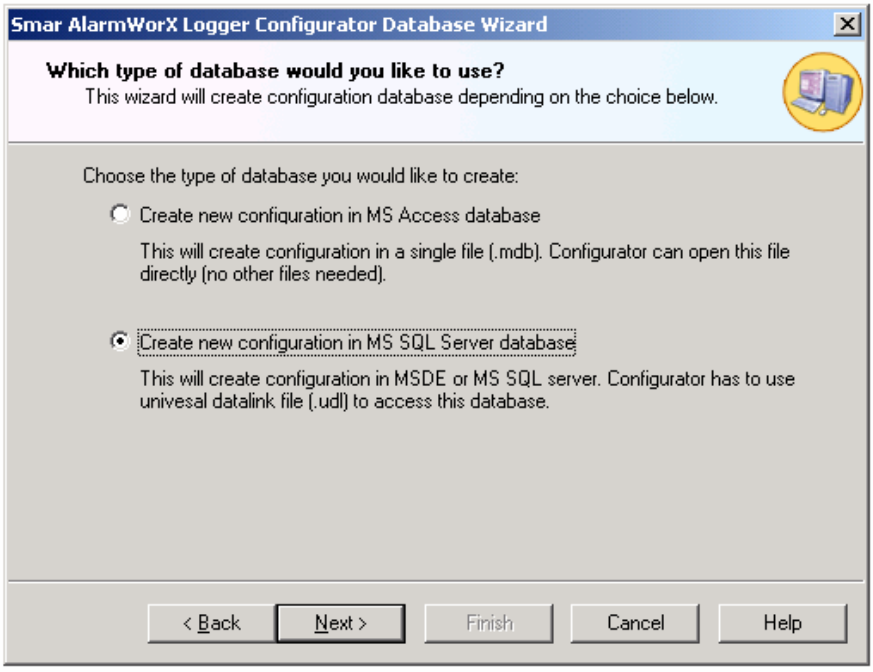
1. Select **New** from the **File** menu, as shown in the figure below**.**



Creating a Configuration Database

2. The introduction screen for the Configuration Database Wizard appears. Click the **Next** button to continue.

3. You have two options for creating your new database, as shown in the figure below. Select **Create new configuration in MS SQL Server database.** Click the **Next** button to continue.

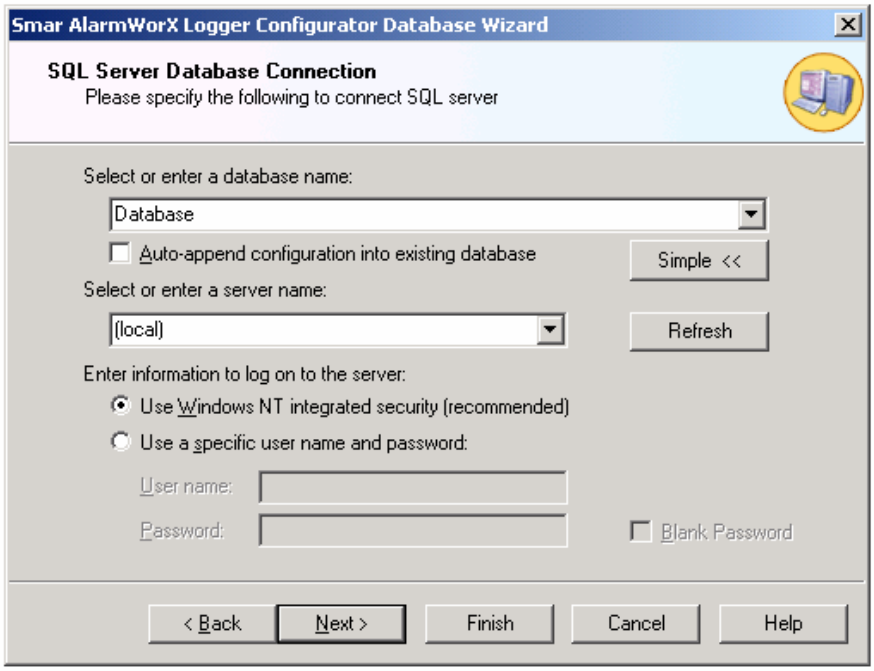


Creating a New Microsoft SQL Server Database

4. To connect to a SQL Server database, either select an existing database from the **Database Name** drop-down list, or a type a new name to create a new database, as shown in the figure below. If you choose to use an existing database, you have the option of adding (auto-appending) the configuration to the existing database. (For more information about the auto-append function, please see "Adding the Configuration to an Existing Database.")

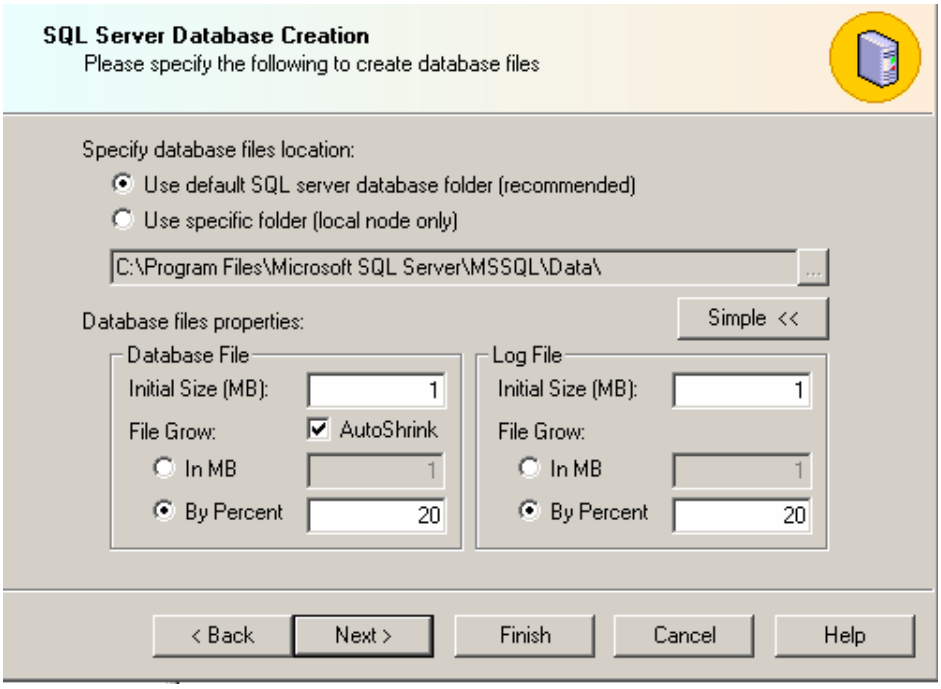
In the **SQL Server Name** field, select the local SQL Server on which to create the database. If necessary, enter a user name and password to log on to the SQL Server. (It is recommended that you use Windows NT integrated security.)

Note: Usually you have only one instance of SQL Server running on the local node. In this case, the drop-down list under **SQL Server Name** has only one option: "(local)." However, it is possible to run multiple SQL Server instances on the local node, in which case the **SQL Server** field lists all those SQL Server instances: "(local)" for the default instance and "node_name/instance_name" for all others. The drop-down list may show SQL Server instances on other nodes as well.



Connecting to a SQL Server Database

5. Specify a directory path location in which to create the database, as shown in the figure below. You can either use the default SQL Server database folder, or you can click the **...** button and browse for a specific folder.



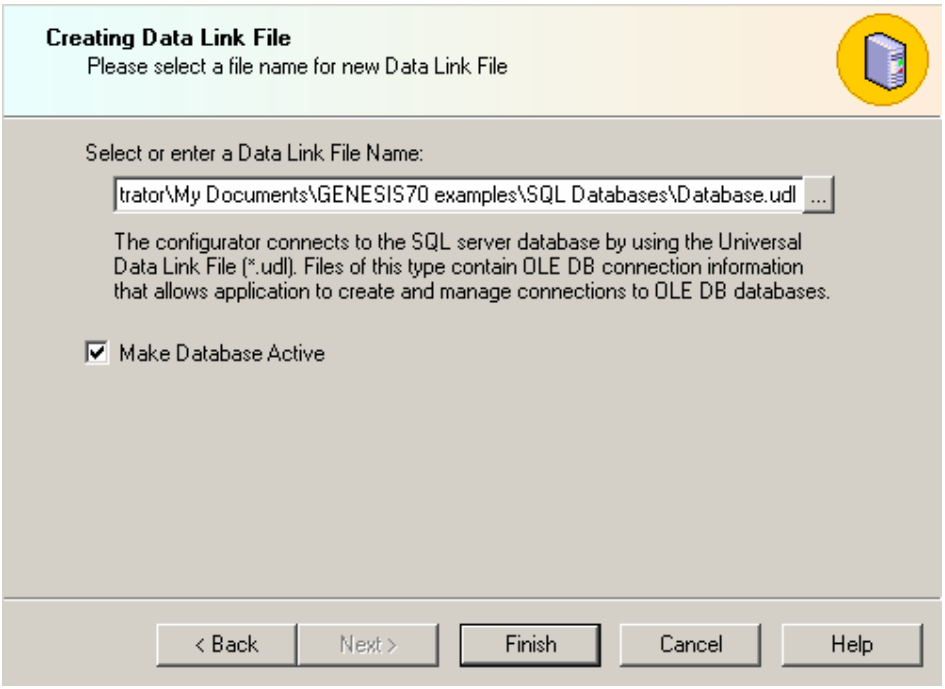
Specifying the Database Location and Properties

Under the **Database Properties** section, specify an initial size for the database, which should be as large as possible. You can also specify a **Database Growth** option (in megabytes) or as a percentage of the total size. MSDE servers are capable of growing the database on the fly to store more data. However, if this operation is performed frequently, the overall system performance may decrease. Choosing an initially large database size and a corresponding database growth option can drastically improve system performance.

Under the **Log File Properties** section, you can also modify the settings for the database transaction log file. Specify a **Log File Growth** option (in megabytes) or as a percentage of the total size. Again, a sufficient initial size setting can greatly improve performance. The default options should be adequate for most applications with a small to medium size load.

Click the **Next** button to create the new SQL Server database.

6. The Configurator uses Universal Data Link (.udl) files to connect to the Microsoft SQL Server database. These .udl files contain OLE database connection information that allows the Configurator to create and manage connections to OLE databases. Enter a name and directory path for the new .udl file in the **Data Link File Name** field, as shown in the figure below. You can browse for a directory by clicking the **...** button to the right of this field. Click the **Next** button to continue. If you want this new database to be the active configuration database, check **Make Database Active.**



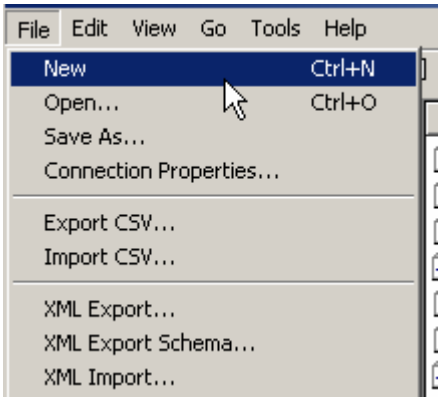
Creating a Universal Data Link File

7. Click the **Finish** button. The new database is created and opened in the Configurator.

Adding a Configuration Database to an Existing SQL Server Database

The Configuration Database Wizard also gives you the option to add the configuration database structure to an existing Microsoft SQL Server database:

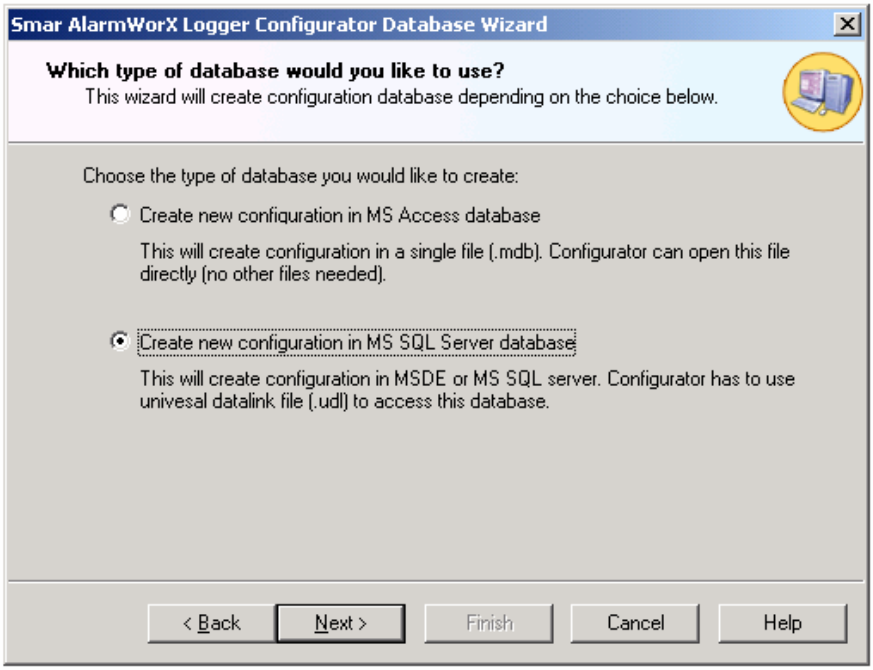
1. Select **New** from the **File** menu, as shown in the figure below.



Creating a Configuration Database

2. The introduction screen for the Configuration Database Wizard appears. Click the **Next** button to continue.

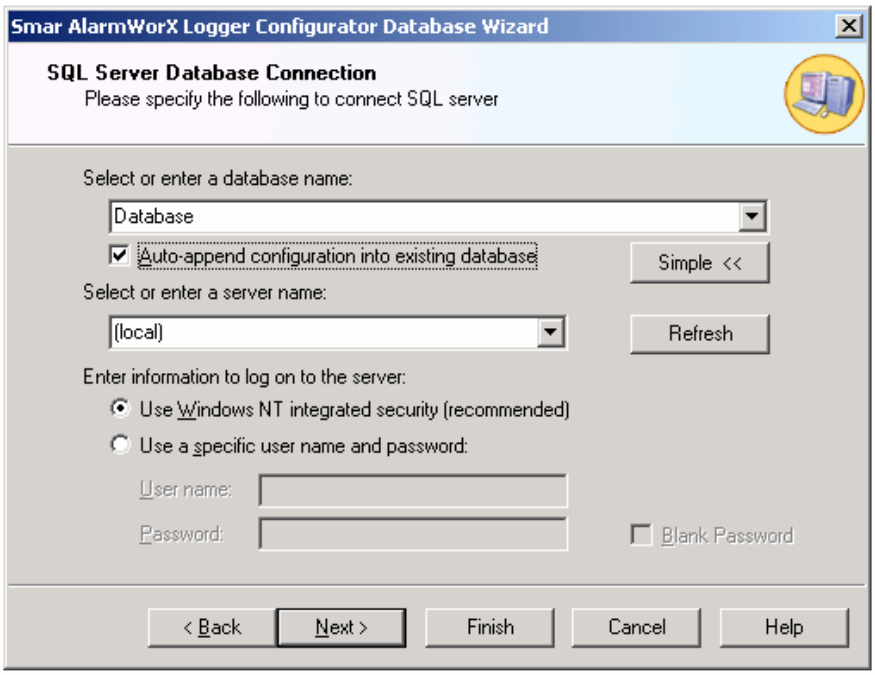
3. You have two options for creating your new database, as shown in the figure below. Select **Create new configuration in MS SQL Server database.** Click the **Next** button to continue.



Creating a Microsoft SQL Server Database

4. To connect to a SQL Server database, select the existing database from the drop-down list, as shown in the figure below. Check the **Auto-append configuration into existing database** check box. In the **SQL Server** field, select the local SQL Server on which to create the database. Type a name for the database in the **Database Name** field. If necessary, enter a user name and password to log on to the SQL Server. (**Note:** It is recommended that you use Windows NT integrated security.) Click the **Next** button to continue.

Note: Usually you have only one instance of SQL Server running on the local node. In this case, the drop-down list under **SQL Server Name** has only one option: "(local)." However, it is possible to run multiple SQL Server instances on the local node, in which case the **SQL Server** field lists all those SQL Server instances: "(local)" for the default instance and "node_name/instance_name" for all others. The drop-down list may show SQL Server instances on other nodes as well.



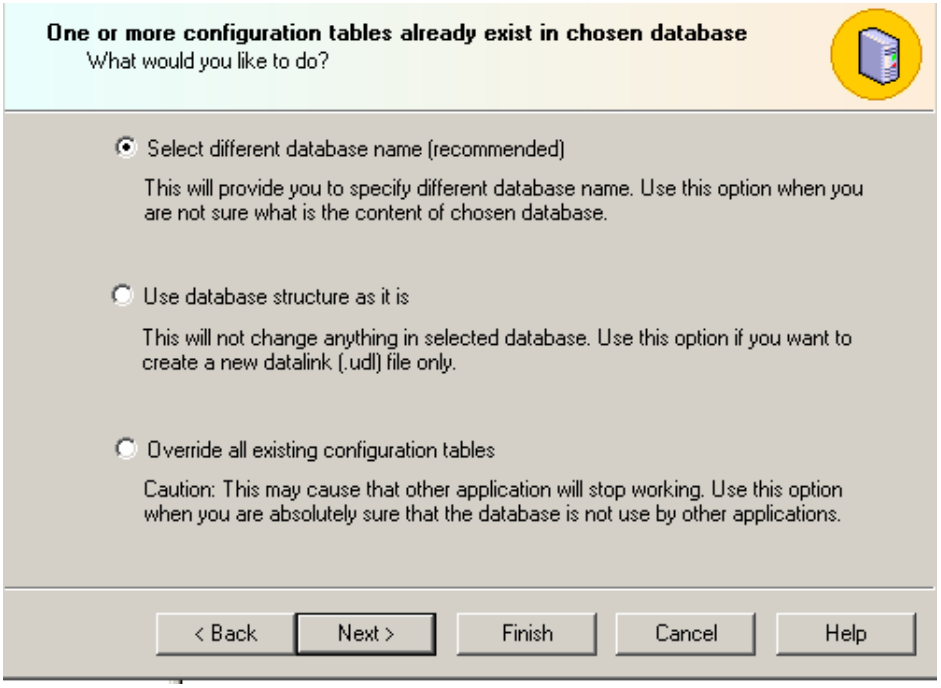
Connecting to an Existing SQL Server Database

5. If the existing database already has configuration tables, you have the following options, as shown in the figure below:

- **Select a different database name (recommended):** This option allows you to rename the database without affecting the existing database as well as create a new Data Link (.udl) file.
- **Use the existing database structure:** This option preserves the content of the existing database and allows you to create a new Universal Data Link (.udl) file.
- **Override all existing configuration tables:** This option expunges the content of the existing database and allows you to create a new Universal Data Link (.udl) file.

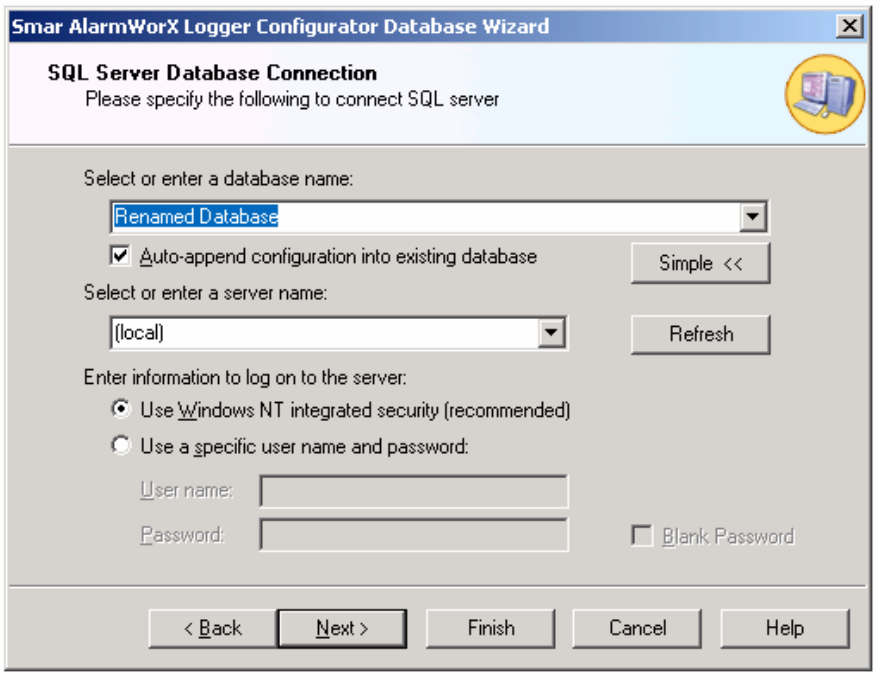
Note: Overriding the database may disable other applications that also use the database.

Click the **Next** button to continue.



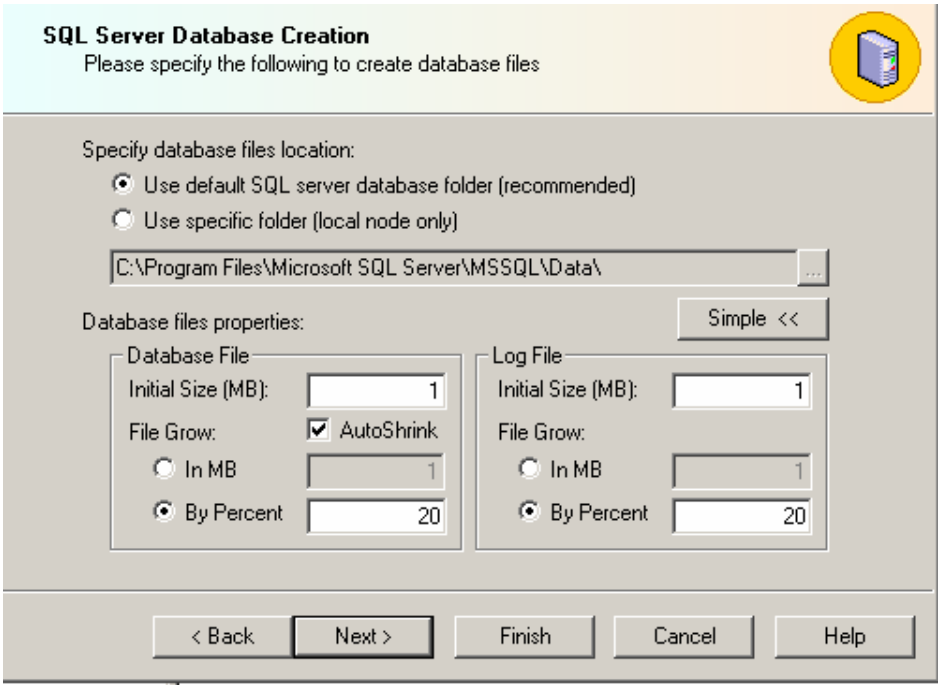
Adding the Configuration to an Existing SQL Server Database

6. If you chose **Select a different database name (recommended),** you are directed back to the SQL Server Database Connection dialog box, as shown in the figure below. Enter a new name for the database, and then click **Next.**



Renaming the Existing SQL Server Database

7. Specify a directory path location in which to create the database, as shown in the figure below. You can either use the default SQL Server database folder, or you can click the **...** button and browse for a specific folder.



Specifying the Database Location and Properties

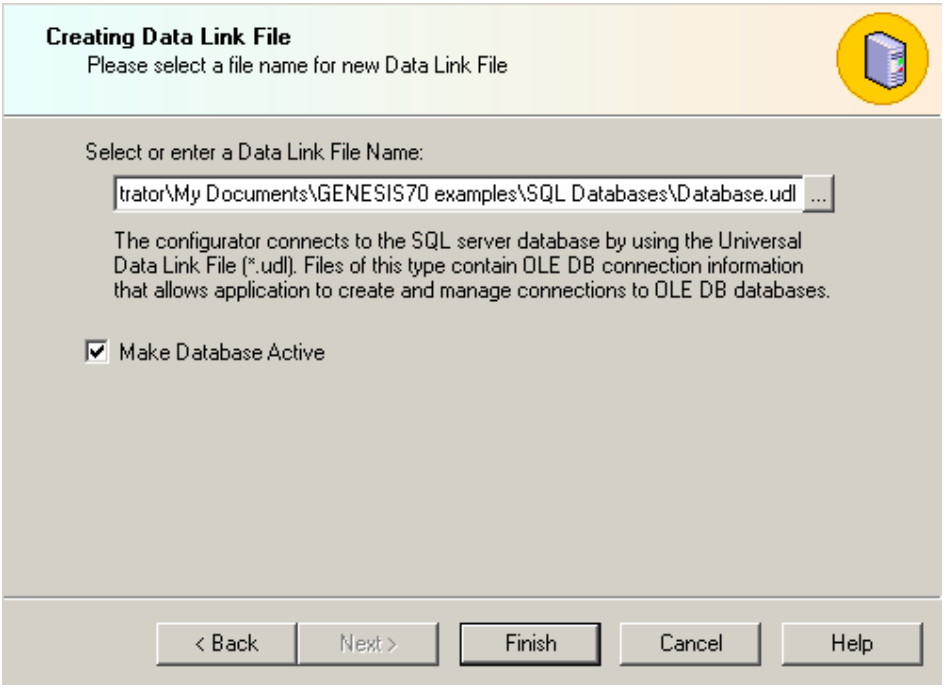
Under the **Database Properties** section, specify an initial size for the database, which should be as large as possible. You can also specify a **Database Growth** option (in megabytes) or as a percentage of the total size. MSDE servers are capable of growing the database on the fly to store more data. However, if this operation is performed frequently, the overall system performance may decrease. Choosing an initially large database size and a corresponding database growth option can drastically improve system performance.

Under the **Log File Properties** section, you can also modify the settings for the database transaction log file. Specify a **Log File Growth** option (in megabytes) or as a percentage of the total size. Again, a sufficient initial size setting can greatly improve performance. The default options should be adequate for most applications with a small to medium size load.

Click the **Next** button to create the new SQL Server database.

8. The Configurator uses Universal Data Link (.udl) files to connect to the Microsoft SQL Server database. These .udl files contain OLE database connection information that allows the Configurator to create and manage connections to OLE databases. Enter a name and directory path for the new .udl file in the **Data Link File Name** field, as shown in the figure below. You can browse for a directory by clicking the **…** button to the right of this field. Click the **Next** button to continue. If you want this new database to be the active configuration database, check **Make Database Active**

Note: If you chose to **Use the existing database structure** or to **Override all existing configuration tables,** you will still need to create a new Data Link file.



Creating a Universal Data Link File

9. Click the **Finish** button. The new database is created and opened in the Configurator.

Toolbars

The Alarm Logger Configurator contains two toolbars: a **Standard** toolbar and a **Data Manipulation** toolbar.

Standard Toolbar

To show or hide the **Standard** toolbar, select **Toolbars > Standard Buttons** from the **View** menu. The **Standard** toolbar, shown below, contains the following command buttons.

New: Creates a new configuration database.

Open: Opens an existing configuration database.

Export Data: Exports configuration data to a text file (.txt) or a Microsoft Excel file (.csv).

Import Data: Imports configuration data from a text file (.txt) or a Microsoft Excel file (.csv).

Back: Moves the cursor back to the previously selected item in the tree control.

Next: Moves the cursor to the next item in the tree control.

Up One Level: Moves up one level in the tree control.

Cut: Deletes current selection, sending it to the clipboard.

Copy: Copies the current selection to the clipboard.

Paste: Pastes the current contents of the clipboard.

Large Icons: Displays items as large icons.

Small Icons: Displays items as small icons.

List: Displays items as a list.

Details: Displays items as a list with details.

Dialog View: Displays additional configuration options.

Global Refresh: Refreshes the data for the entire Configurator screen.

Start/Stop Logger: Toggle runtime mode for the Alarm Logger.

About: Displays information about the application.

Help: Displays context-sensitive help.

Help Topics: Launches online Help for the application.

Data Manipulation Toolbar

To show or hide the **Data Manipulation** toolbar, select **Toolbars > Data Manipulation Buttons** from the **View** menu. The **Data Manipulation** toolbar, shown below, contains the following command buttons.

New Configuration: Creates a new Logger configuration under the **Configurations** tree.

New Column Definition: Creates a Column Definition for a Logger configuration.

New Node: Creates a new node under the **Nodes** tree control.

New Link to Configuration: Creates a new link to a Logger configuration.

Multiply: Creates a copy of the selected item in the tree control.

Delete: Deletes the selected item in the tree control.

Menus

The menu bar of the Alarm Logger Configurator contains the following menus:

File

Edit

View

Go

Action

Tools

Help

Note: You can also access many of the menu commands by right-clicking items in the tree control of the Configurator and selecting command functions from the pop-up menus.

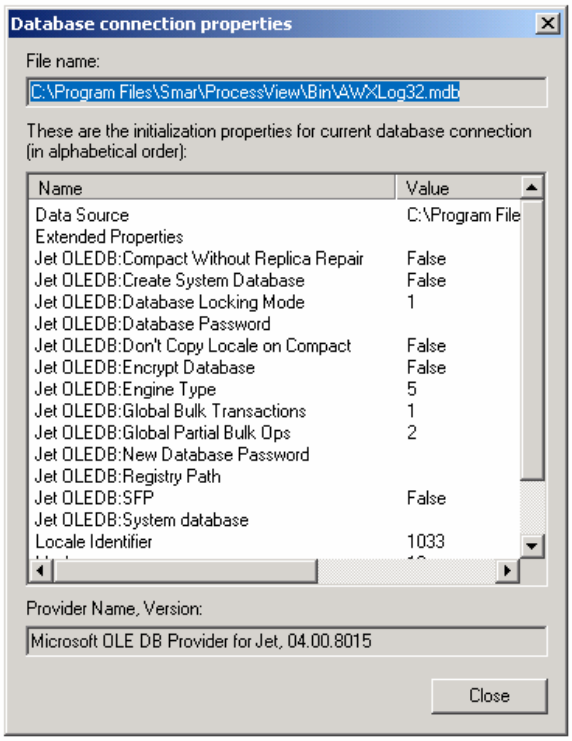
File Menu

~ The **File** menu of the AlarmWorX Logger Configurator contains the following commands:

Command	Shortcut Key	Function
New	CTRL+N	Creates a new configuration database.
Open	CTRL+O	Opens a new .mdb (Microsoft Data Access) or .udl (Microsoft Data Link) file.
Save As		Saves the database under a different name.
Connection Properties		Opens the **Database Connection Properties** dialog box.
CSV Export		Exports data from a selected .csv file.
CSV Import		Imports data from a selected .csv file.
XML Export		Exports configuration data to an XML file.
XML Export Schema		Exports configuration data to an XML Schema file.
XML Import		Imports configuration data from an XML file.
XML Validate		This feature does not import an XML data file, but it will try to validate its structure using stored XML schema. Once it passes this validation, the XML file is acceptable for import by the Configurator.
Make Active		Activates the current configuration database for use by the alarm server.
Exit		Closes the applications and stops data logging if it started within the Configurator.

Database Connection Properties

Selecting **Connection Properties** from the **File** menu opens the **Database Connection Properties** dialog box, shown below, which lists the initialization properties for the current database connection.

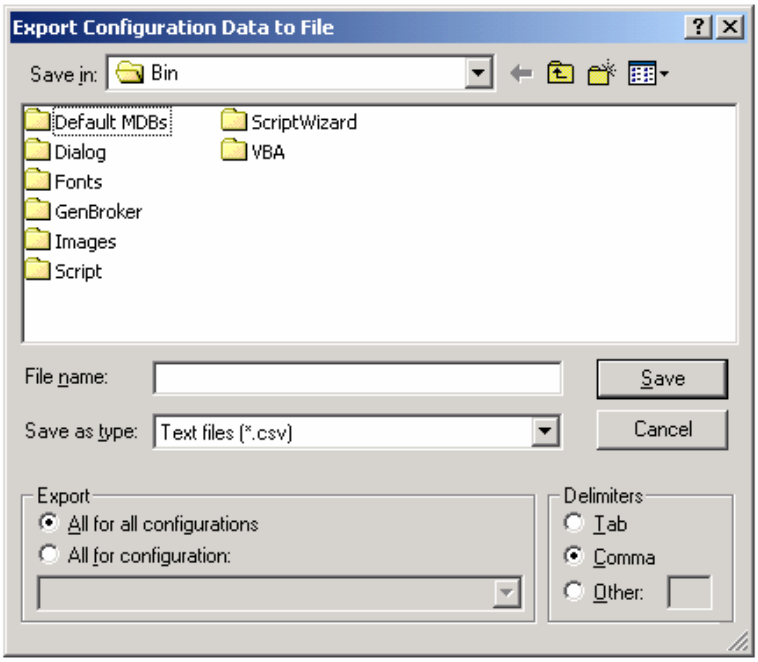


Database Connection Properties Dialog Box

Exporting Configuration Data

Exporting Data to a Text or CSV File

The Configurator offers the flexibility of exporting data from your configuration database to a text (.txt) file or a Microsoft Excel (.csv) file. To export data, select **Export** from the **File** menu. This opens the **Export Configuration Data to File** dialog box, as shown in the figure below. You can then specify the delimiters for exporting the data. Unless you specify delimiters in the **Export Configuration Data to File** dialog box, the file uses **Commas** as delimiters by default. Each group contains headings and columns that provide information about each item, such as descriptions and associated translations and expressions. It also provides the "tree" pathway for each item. Choose the directory to which you want to export the data from your database. In the **Save As Type** field, choose the file type (.txt or .csv) that you would like to save.



Exporting Configuration Data

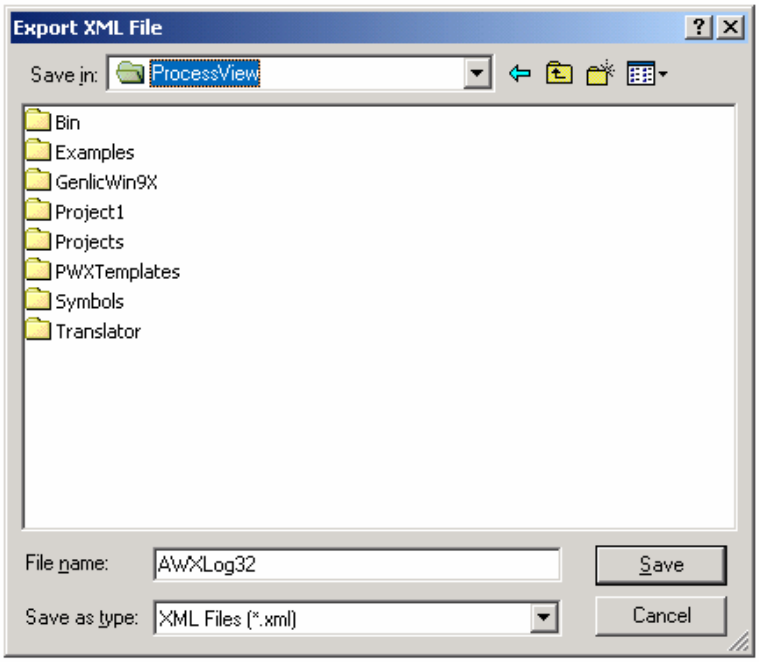
Exporting Data to an XML File

The Configurator also allows you to export data from your configuration database to an XML file. The XML export/import functionality was mainly developed for Windows platforms that do not support databases (e.g. Windows CE and Windows Embedded). XML has the following advantages over the CSV import/export function:

- XML has a standardized format, unlike the text/CSV format, which uses various delimiters (e.g. TAB instead of commas, strings could not accept all characters, etc.)
- XML is language-independent, whereas CSV converts date/time, floats, and currency fields according to local settings in Windows. For example, using CSV, you cannot export data on German Windows and import it on English windows without making changes
- Windows has an installed automation object that has the capability to work with XML. Thus, programmers can create/modify their configurations outside the Configurator using Visual Basic, if desired.
- XML supports schemas. A **schema** is a special XML file that specifies the data structure of an XML data file.

To export data, select **XML Export** from the **File** menu. This opens the **Export XML File** dialog box, as shown in the figure below. Give the file a name, and then choose the directory to which you want to export the data from your database. Click **Save.**

Note: You can also export configuration data to an XML Scheme file by selecting **XML Export** from the **File** menu.



Exporting Configuration Data to an XML File

Importing Configuration Data

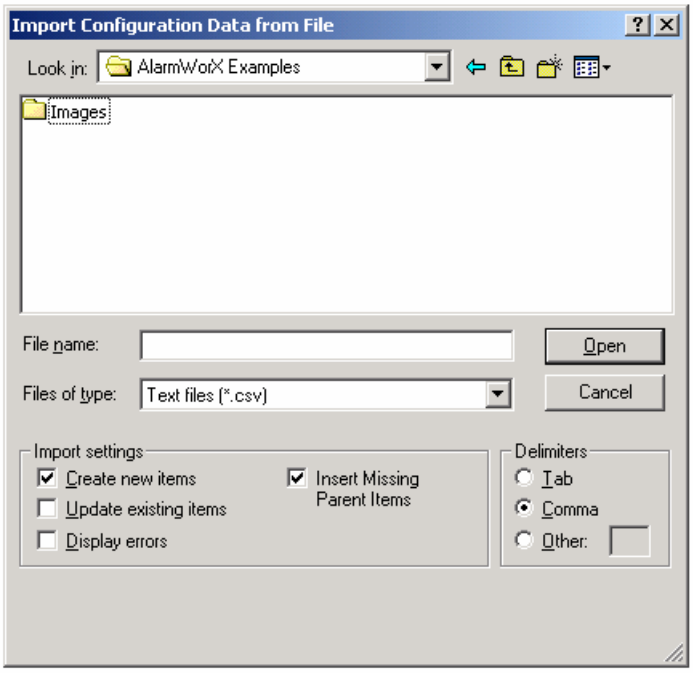
Importing Data From a Text or CSV File

The Configurator offers the flexibility of importing data from a text (.txt) file or a Microsoft Excel (.csv) file to your configuration database. To import data, select **Import CSV** from the **File** menu. This opens the **Import Configuration Data From File** dialog box, shown below. You can then specify the delimiters and choose from the following import settings:

- **Create new items.** When the import file contains items that are not yet in the configuration database, then it creates them. Otherwise it skips these items.
- **Update existing items.** When the import file contains items that are in the configuration database, then it updates them using data from the import file. Otherwise it skips these items.

Note: Either **Create new items** or **Update existing items** must be selected. Otherwise there is nothing to import.

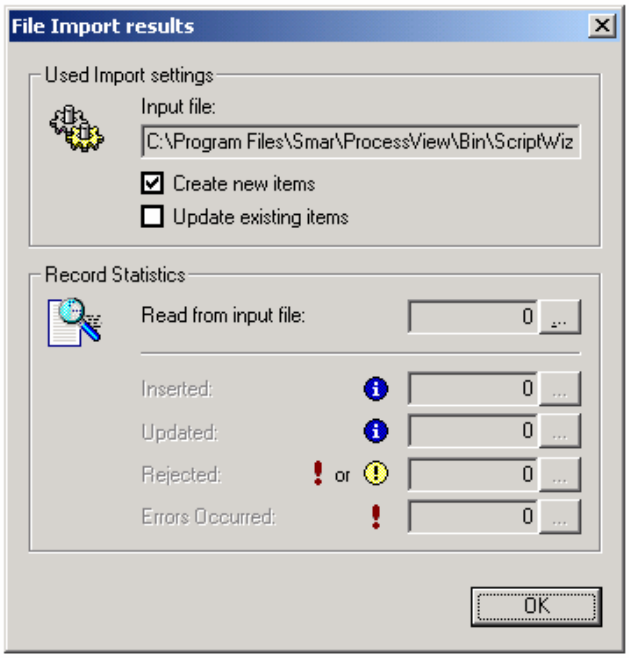
- **Display errors.** When this item is checked, the Configurator shows a dialog box if an error occurs, and then asks you if you want to proceed with the import. When it is not checked, it skips all items where an error occurred.



Importing Configuration Data

When you have selected a file to import, click **Open.** When the import is completed, the **File Import Results** dialog box opens, as shown below. This shows the import settings, including the input file name. It also provides a summary of the import, including how many items were inserted, updated, or rejected, and shows how many errors occurred.

Click the **...** button to the right of each field to get the details view of the import results, as shown below. This view shows the specific items that were inserted, updated, or rejected, as well as a description of any errors that occurred.



File Import Results Dialog Box

Importing Data From an XML File

The Configurator allows you to import data from your configuration database to an XML file. The XML export/import functionality was mainly developed for Windows platforms that do not support databases (e.g. Windows CE and Windows Embedded). XML has the following advantages over the CSV import/export function:

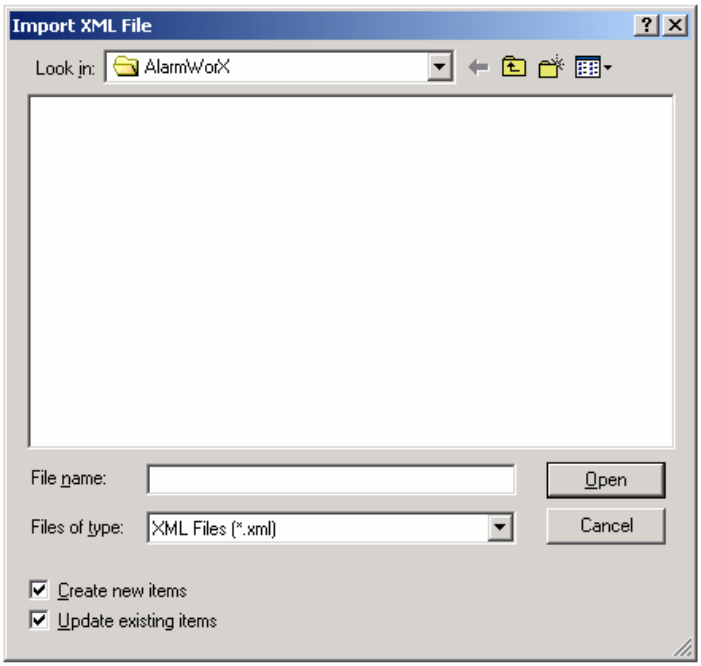
- XML has a standardized format, unlike the text/CSV format, which uses various delimiters (e.g. TAB instead of commas, strings could not accept all characters, etc.)
- XML is language-independent, whereas CSV converts date/time, floats, and currency fields according to local settings in Windows. For example, using CSV, you cannot export data on German Windows and import it on English windows without making changes
- Windows has an installed automation object that has the capability to work with XML. Thus, programmers can create/modify their configurations outside the Configurator using Visual Basic, if desired.
- XML supports schemas. A **schema** is a special XML file that specifies the data structure of an XML data file.

To import data, select **XML Import** from the **File** menu. This opens the **Import XML File** dialog box, as shown in the figure below. Give the file a name, and then choose the directory from which you want to import the data. You can then specify the delimiters and choose from the following import settings. Click **Open.**

- **Create new items.** When the import file contains items that are not yet in the configuration database, then it creates them. Otherwise it skips these items.
- **Update existing items.** When the import file contains items that are in the configuration database, then it updates them using data from the import file. Otherwise it skips these items.

Note: Either **Create new items** or **Update existing items** must be selected. Otherwise there is nothing to import.

Note: Selecting **XML Validate** from the **File** menu does not import an XML data file, but it will try to validate its structure using stored XML schema. Once it passes this validation, the XML file is acceptable for import by the Configurator.

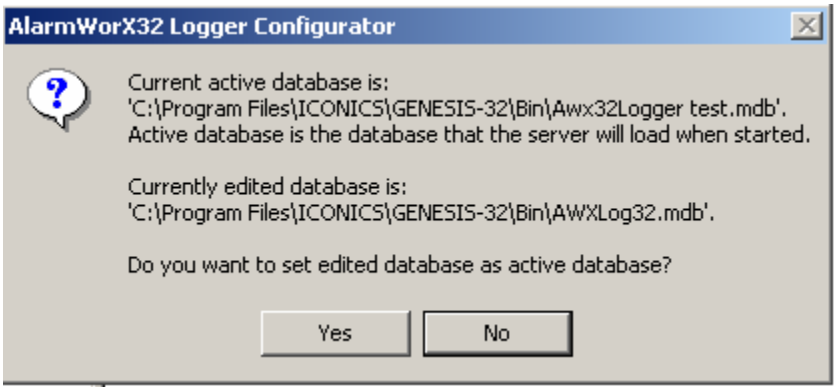


Importing Configuration Data From an XML File

Activating the Database

Once your configuration is complete, you need to make sure that it is the active database. The database that is currently active is the one that the alarm server will use. To make the current database active, select **Make Active** from the **File** menu. If the **Make Active** selection is grayed out, then the current database is already the active database.

A dialog box appears, as shown in the figure below, showing both the current active database and database that is currently being edited, as shown in the figure below. To set the edited database as the active database, click the **Yes** button.



Activating the Database

Edit Menu

The **Edit** menu commands are listed in the table below.

Edit Menu Commands

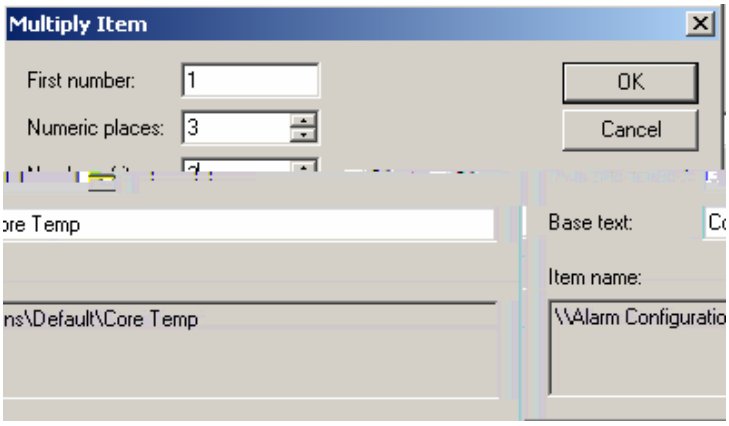
Command	Shortcut Keys	Function
New		Creates a new item depending on what is selected in the tree control.
Rename	CTRL+R	Renames the selected item.
Multiply	CTRL+M	Opens the **Multiply Item** dialog box (see below), which allows you to multiply an item in the tree control.
Delete	CTRL+DEL	Deletes the selected object.
Cut	CTRL+X	Cuts the selected object from the view and places it on the clipboard.
Copy	CTRL+C	Copies the selected object to the clipboard.
Paste	CTRL+V	Pastes the last object placed on the clipboard.
Select All	CTRL+A	Selects all objects in a list. The selection is shown in the upper-right-hand section of the viewer.
Invert Selection		Unselects all selected items and selects all unselected items in a list in the upper-right-hand section of the viewer.

Multiplying Items

The Alarm Logger Configurator allows you to multiply items in the tree control. Multiplication provides a simple way of developing configurations where there are many similar items in a given category. To multiply an item:

1. Select the item in the tree control that you wish to multiply.

2. Either right-click the item and select **Multiply** from the pop-up menu, or select **Multiply** from the **Edit** menu. This opens the **Multiply Item** dialog box, shown below.



Multiply Item Dialog Box

3. When the items are multiplied, they are all given a base name followed by a number. The default base text is the name of the item selected for multiplication. To modify the base text, change the **Base Text** field appropriately.

4. In the **First Number** field, specify the number to appear next to the first multiplied item.

5. In the **Number of Items** field, specify how many items you wish to create.

6. In the **Numeric Places** field, specify the minimum length of each number to append. Values that take up less space than the specified amount of numeric places will have zeros before the number.

7. If you want to multiply all subfolders as well, check the **Including Subtree** check box.

8. Click the **OK** button to do the multiplication. The example configuration shown in the **Multiply Item** dialog box above creates three new OPC Data folders with the following names:

- Core Temp001
- Core Temp002
- Core Temp003

All subfolders will also be multiplied.

View Menu

The **View** menu commands are listed in the table below.

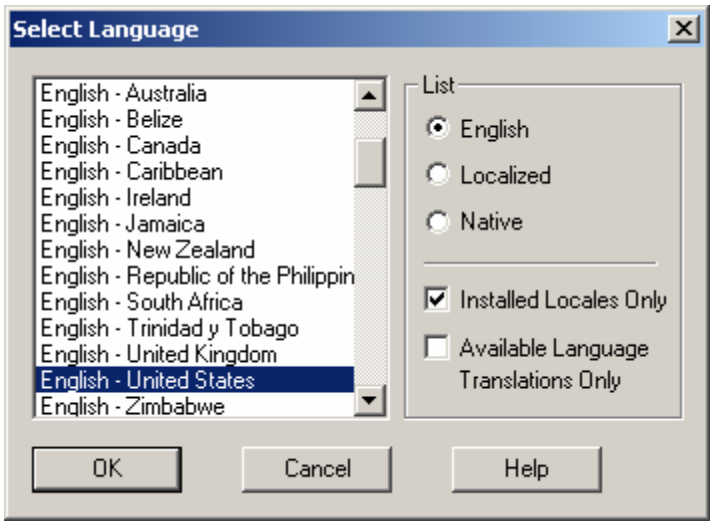
View Menu Commands

Command	Shortcut Keys	Function
Toolbars		Toggles the standard and data manipulation toolbars.
Status Bar		Toggles the status bar.
Large Icons	F7	Displays items as large icons.
Small Icons	F8	Displays items as small icons.
List	F9	Displays items as a list.
Details	F10	Displays items as a list along with detailed information about the configuration of each item.
Dialog View	F11	Toggles the configuration window (right-hand pane).
Sort By		Displays a list of options for sorting the columns in the right-hand pane of the screen. The options listed depend on the level within the view.
Show/Hide Columns		Displays a list of options that you can choose to show or hide in the view.
Select Language		Opens the **Select Language** dialog box (see below). Choose the language you wish to use for your system (Unicode version only) and click **OK.** For navigation purposes, use the buttons and check boxes in the **List** section.
Global Refresh	F5	Refreshes the data for the entire Configurator screen.
Subtree Refresh	CTRL+F5	Refreshes only the data contained in the currently selected subtree.

Selecting Languages

The **Select Language** function on the **View** menu allows you to choose which language to use in your display. Choosing **Select Language** from the **View** menu opens the **Select Language** dialog box, shown in the figure below.

Note: A language resource .dll is required for language switching.



Select Language Dialog Box

Define the parameters listed in the table below. Then click **OK** to return to the work area.

Select Language Parameters

Parameter	Description
List	Lists available languages. Depending on which item you have selected, the view on the left will change. If **English** is checked, the languages will appear as their English name. If **Localized** is checked, the languages will appear with the native country in parentheses (for languages with several dialects only). When **Native** is checked, the languages are displayed the way they would be written in that language.
Installed Locales Only	If this is checked, local languages appear in the box.
Available Language Translations Only	Checking this box allows you to choose from available language translations only.

Go Menu

The **Go** menu commands are listed in the table below.

Go Menu Commands

Command	Shortcut Keys	Function
Back	CTRL+ALT+ Left Arrow	Moves the cursor back to the previously selected item in the tree control.
Forward	CTRL+ALT+ Right Arrow	Moves the cursor forward to the previously selected item in the tree control.
Up One Level		Moves the cursor up one level in the tree control.
Next Item	ALT+Down Arrow	Moves the cursor to the next item down in the tree control.
Previous Item	ALT+Up Arrow	Moves the cursor to the next item up in the tree view.
Expand Item	ALT+Left Arrow	Expands an item that contains a submenu.
Collapse Item	ALT+Right Arrow	Collapses an item that contains a submenu.
Page Up	ALT+PgUp	Moves the cursor up to the first item in the tree.
Page Down	ALT+PgDown	Moves the cursor down to the last visible item in the tree.

Command	Shortcut Keys	Function
Home	ALT+Home	Moves the cursor up to the first item in the tree.
End	ALT+End	Moves the cursor down to the last visible item in the tree.
Next Pane	F6	Moves the cursor to the next pane.
Previous Pane	SHIFT+F6	Moves the cursor to the last pane used.

Action Menu

The **Action** menu contains the following commands:

Command	Function
Start Alarm Logger	Starts alarm data logging for the active configuration.
Stop Alarm Logger	Stops t alarm data logging for the active configuration.

Only one of the above options will be available at a time, depending on the state of the Alarm OPC Logger.

Tools Menu

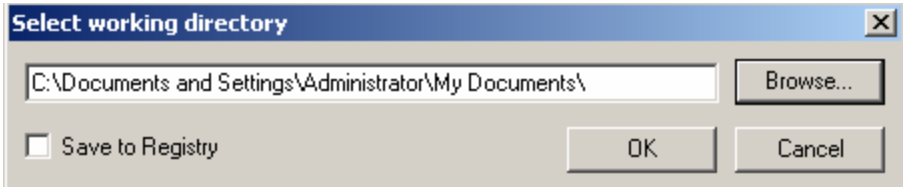
The **Tools** menu commands are listed in the table below.

Tools Menu Commands

Command	Function
Set Working Directory	Sets a working directory for all files relating to the saved configuration.
Options	Launches the **Options** dialog box.
Compact/Repair MS Access Database	Opens the **Compact/Repair MS Access Database** dialog box.

Setting the Working Directory

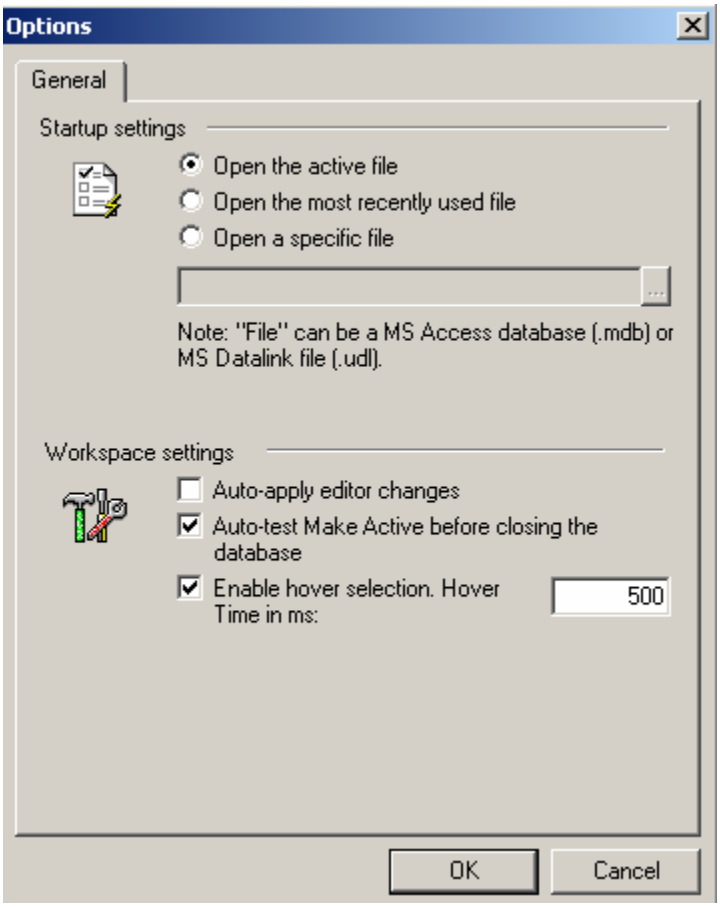
Selecting **Set Working Directory** from the **Tools** menu opens the **Set Working Directory** dialog box, shown below, which enables you to configure a custom directory in which all application configuration files will be stored and retrieved. Click **Browse** to select the directory.



Set Working Directory Dialog Box

Options

To choose additional settings, select **Options** from the **Tools** menu. This opens the **Options** dialog box, shown in the figure below. The **General** tab of the **Options** dialog box, sets the startup and workspace parameters for the Alarm Server Configurator.



Options Dialog Box: General Tab

Startup Settings

The **Startup Settings** options allow you to save regional settings in the registry so that they are applied each time you start the Configurator. This applies to the language settings as well as time and date settings. Select one of the following startup settings:

- **Open the active file:** Launches the currently active database upon startup.
- **Open the most recently used file:** Launches the recently opened database.
- **Open a specific file:** Specifies a Microsoft Access (.mdb) or Microsoft Datalink (.udl) database to launch upon startup. To select a database, click the **...** button next to the text box and browse for the file. When this option is selected, the "active" database is overridden by the specified database.

Workspace Settings

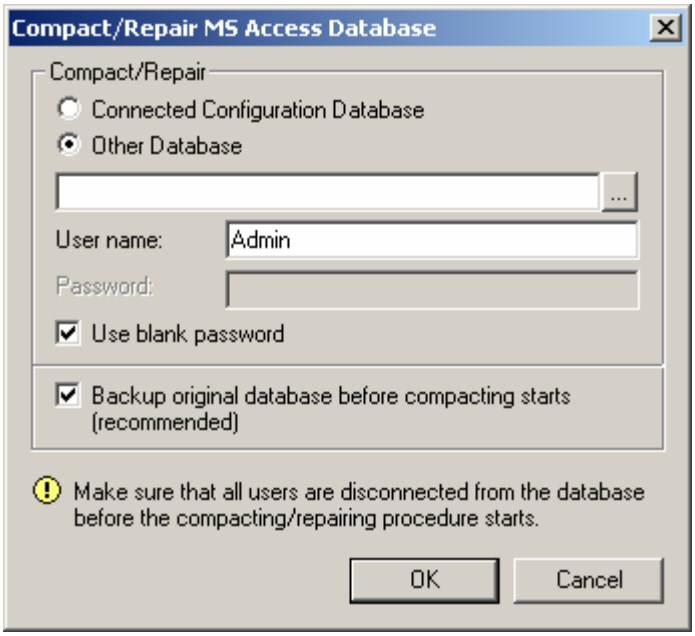
The following **Workspace Settings** are available:

- **Auto-apply editor changes:** Checking this option allows changes to the configuration database to be saved each time you switch dialogs without clicking on the **Apply** button or being shown a message asking if you would like to apply changes.
- **Auto-test Make Active before closing the database:** When this option is checked, each time you exit a currently open (nonactive) database you are asked whether you want to make the database active.
- **Enable hover selection:** Checking this option allows you to highlight an item by moving the mouse pointer over that item and keeping it there for a specified amount of time (in milliseconds).

Compacting and Repairing MS Access Databases

You can compact Microsoft Access databases, which can be either configuration databases or historical databases, using the **Compact/Repair MS Access Database** dialog box, shown in the figure below. To open this dialog box, select **Compact/Repair MS Access Database** from the **Tools** menu. Microsoft Access–based databases are subject to database fragmentation over time, and the support for the database will compact the target database, reclaim unused space, and drastically improve database performance.

Note: It is critical that no users or client applications are connected to the database at the time of compacting and that, if the **Backup Original Database** option is selected, there is plenty of available hard disk space.



Compact/Repair MS Access Database Dialog Box

Help Menu

~ The **Help** menu contains the following commands:

Command	Shortcut Key	Function
Help Topics	F1	Launches the online help for the Configurator.
What's This?	SHIFT+F1	Displays context-sensitive help topics.
About Application		Launches the **SMAR About Box,** which contains information about the product version number, copyright, and available disk space. It also contains information about how to contact SMAR.

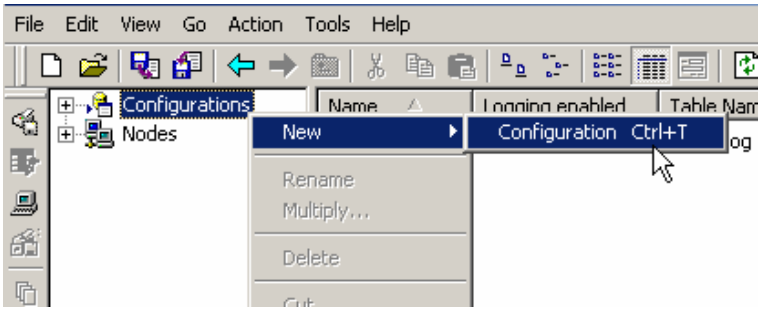
Logger Configurations

The configuration database contains one or more Logger configurations. Each configuration specifies a subset of alarms and events to be logged to a single database table and/or printer. Additionally, the configuration defines which data fields (columns) available are to be stored and/or printed.

Creating a New Logger Configuration

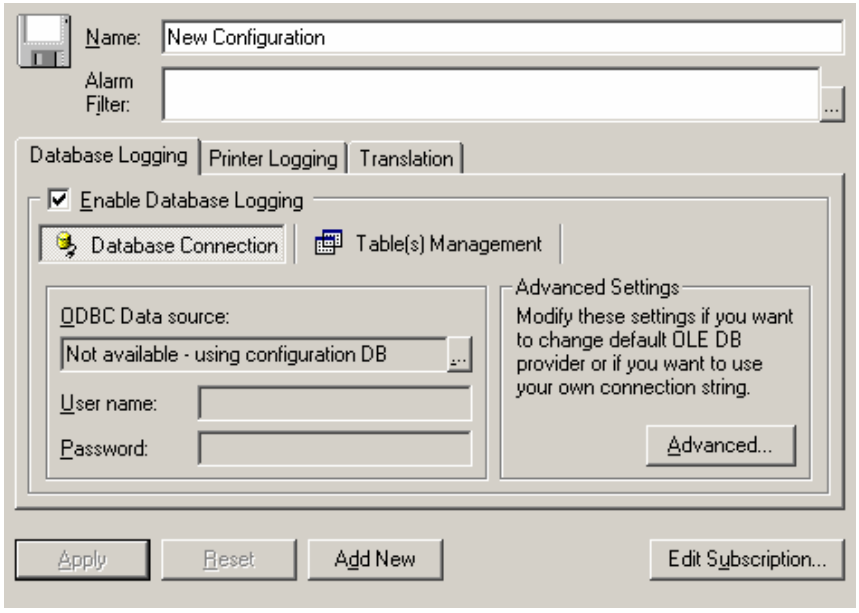
To create a new logger configuration:

1. Right-click on the **Configurations** tree control of the Configurator and select **New > Configuration** from the pop-up menu, as shown in the figure below.



Creating a New Logger Configuration

2. The properties dialog box for the new configuration appears in the right-hand pane of the Configurator, as shown in the figure below.

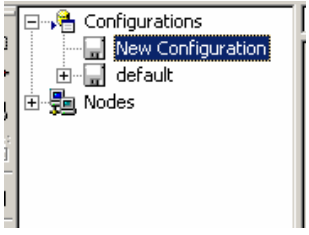


Setting the Properties for the New Logger Configuration

3. In the **Name** field, type a name for the new configuration.

4. In the **Alarm Filter** field, you can click the **...** button to open the **Expression Editor,** which allows you to define alarm filters.

5. When you have finished configuring the Logger configuration properties, click the **Apply** button. The new configuration appears under the **Configurations** tree control, as shown in the figure below.



New Logger Configuration Added to Tree Control

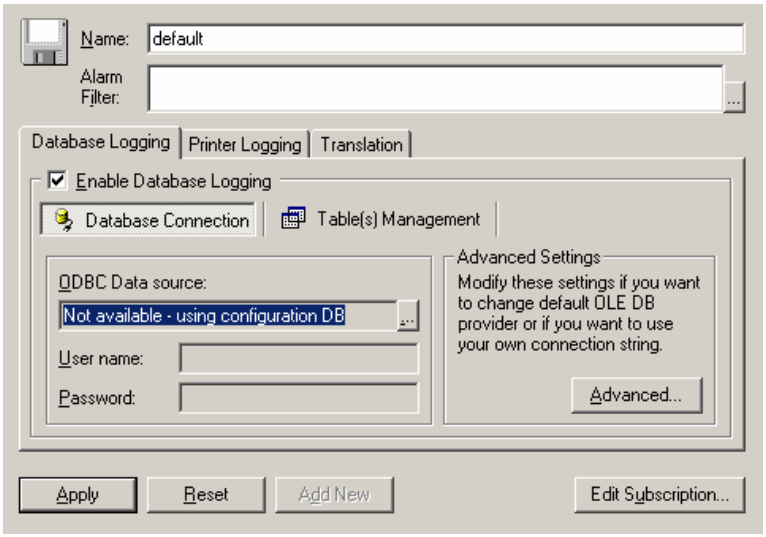
Logger Configuration Properties

Configure the following parameters for Logger configurations, as shown in the figure below.

Note: If **Dialog View** is not selected from the **View** menu, you will not see the configuration properties.

The configuration dialog contains three main tabs:

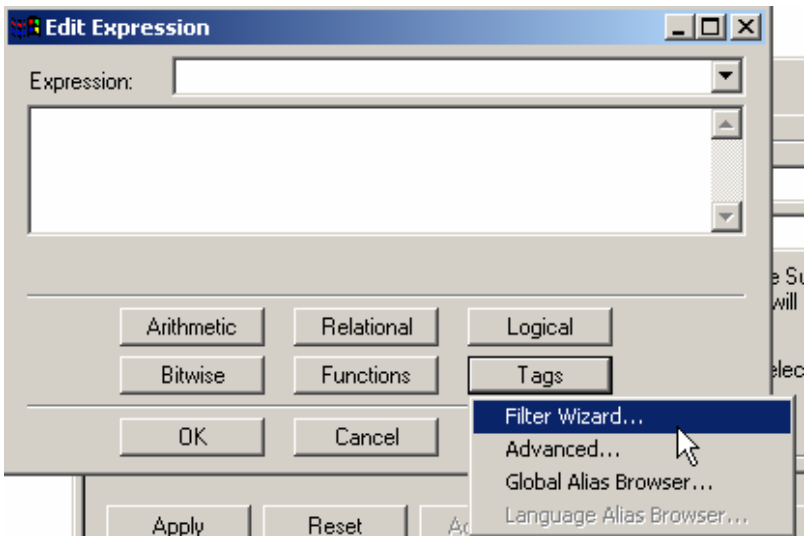
- **Database Logging**
- **Printer Logging**
- **Translation**



Logger Configuration Properties

Name: Type a name for the new configuration. The name must be unique.

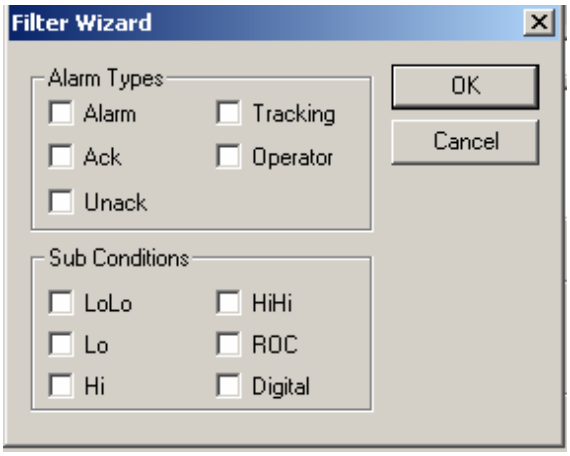
Alarm Filter: Click the **...** button to open the **Expression Editor,** shown in the figure below, which allows you to define alarm filters for the logger configuration. Please refer to the Expression Editor Help documentation for additional information.



Expression Editor

Click on **Tags** button and select **Filter Wizard** from the pop-up menu. The **Filter Wizard,** shown in the figure below, allows you to choose from the following to items enter in your expression. Select one or more items, and then click **OK.** The filter string is automatically inserted into the Edit Expression dialog box.

- Alarm Types: Alarm, Ack, Unack, Tracking, and Operator
- Subconditions: LoLo, Lo, Hi, HiHi, Rate of Change, and Digital



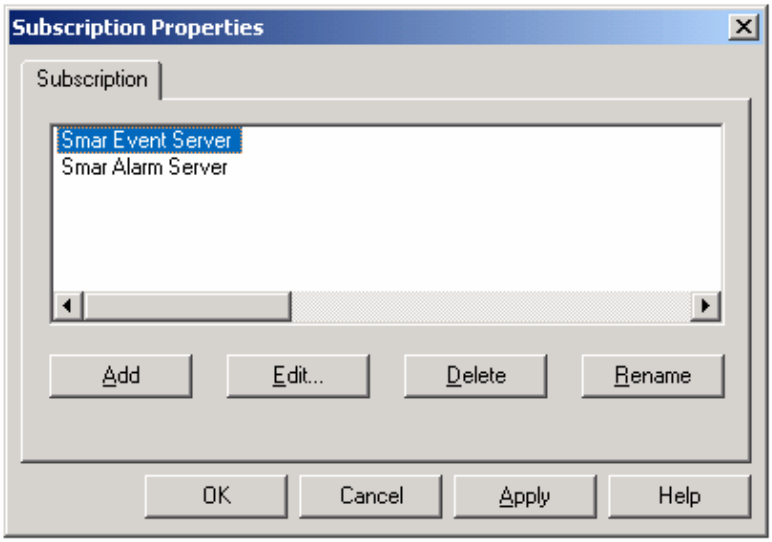
Filter Wizard

Apply Button: Commits changes to the database.

Reset Button: Restores the default configuration settings.

Add New Button: Adds a new Logger configuration to the database.

Edit Subscription Button: Opens the **Subscription Properties** dialog box, shown in the figure below, which allows you to subscribe to one or more OPC Alarm and Events servers and select the desired additional attributes to be included for logging and/or printing. Select a server and click the **Edit** button. This process is identical to the AlarmWorX



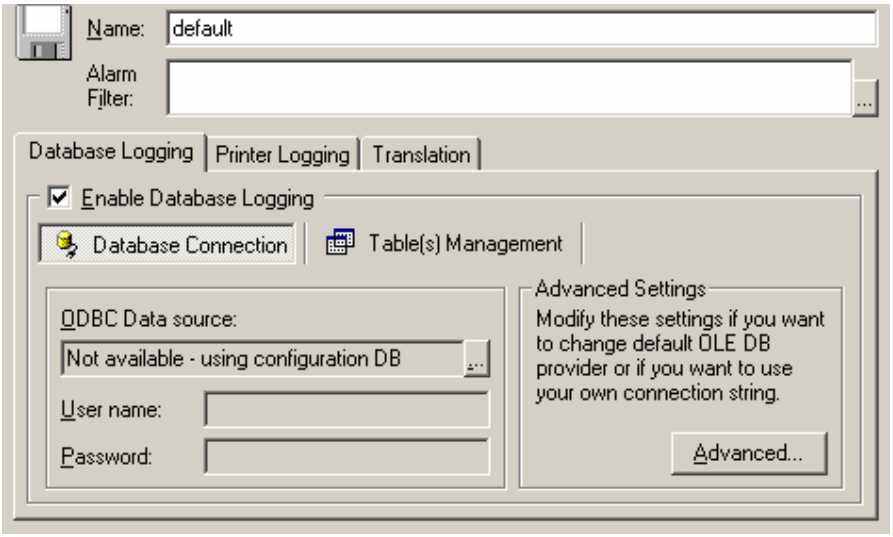
Subscription Properties Dialog

Database Logging Tab

The **Database Logging** tab of the configuration properties, shown in the figure below, contains the following two tabs:

- **Database Connection**
- **Table Management**

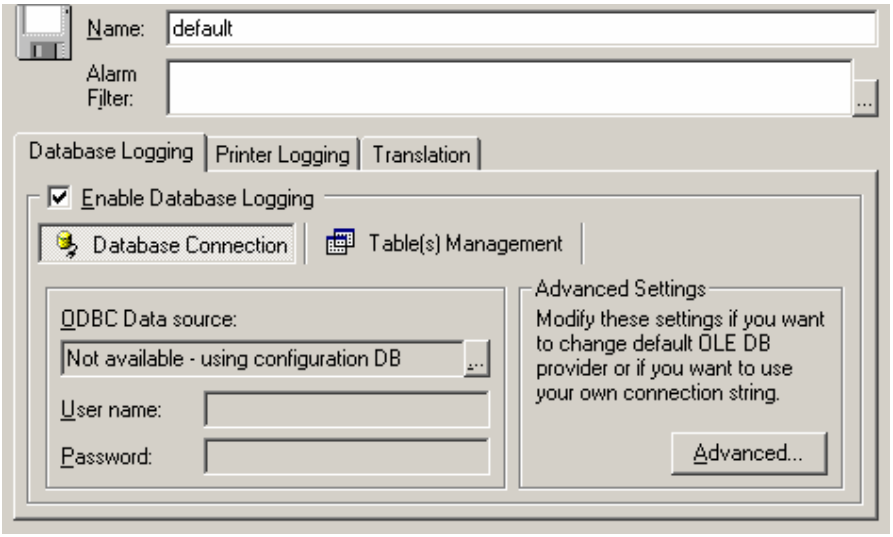
Note: In order to log alarm data to the specified database, you must check the **Enable Database Logging** check box, as shown in the figure below.



Database Logging Tab

Database Connection

The **Database Connection** section of the **Database Logging** tab, shown in the figure below, contains the following two tabs, establishes a connection to an ODBC data source.



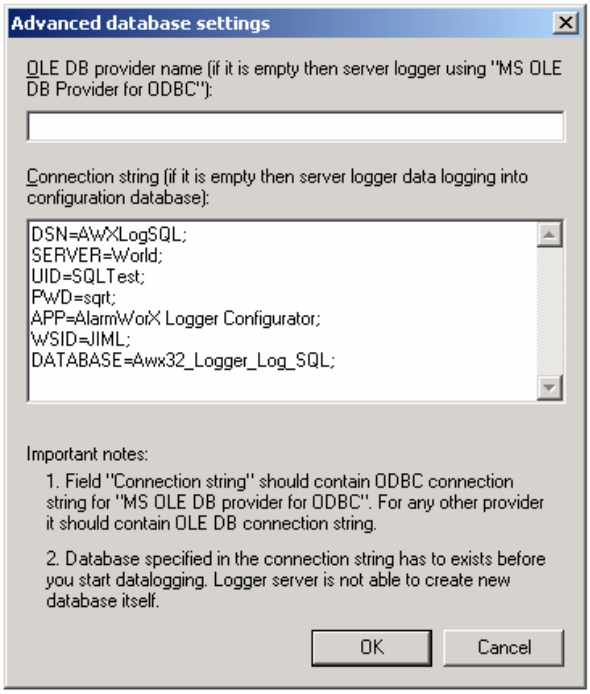
Database Logging: Establishing a Database Connection

The **ODBC Data Source** field specifies the database to use for logging. If this field is blank (the default), logging will take place to the active configuration database. It is highly recommended that you change the default database and log alarm data to a different database from the configuration database.

User Name: Enter the user name to use (if any) when connecting to the logging database.

Password: Enter the password that goes with the **User Name**.

Advanced Button: Clicking **Advanced** opens the **Advanced Database Settings** dialog box, shown in the figure below, which allows the **OLE DB provider name** and the **Connection string** to be edited directly. This capability is provided to allow connection to databases directly via OLE DB (without using ODBC).



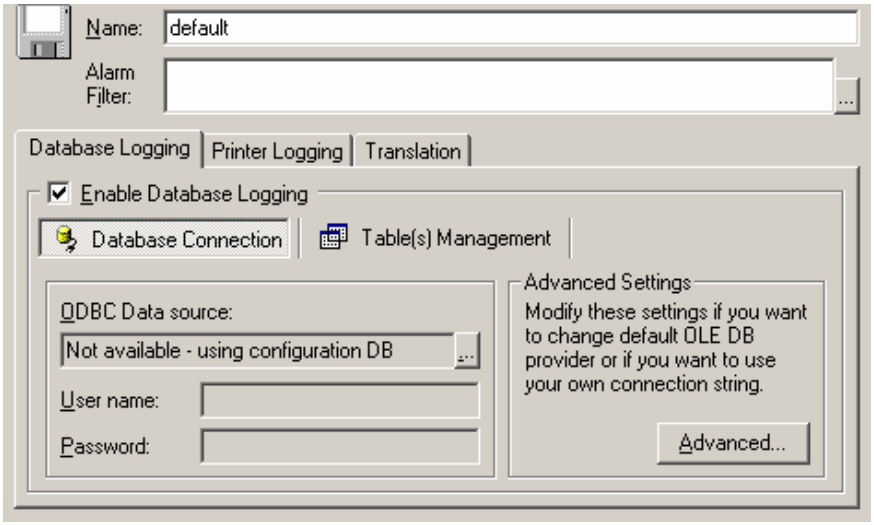
Advanced Database Settings Dialog

Creating a New ODBC Data Source

To set up data logging, you must first configure the underlying database and set up ODBC data sources. This can be done within the Logger Configurator by connecting a database group to an existing database or a new database. It is very critical that the PCs on which the AlarmWorX Logger resides have full access to the target database to create, add, delete, and update tables. Otherwise, data logging cannot be accomplished.

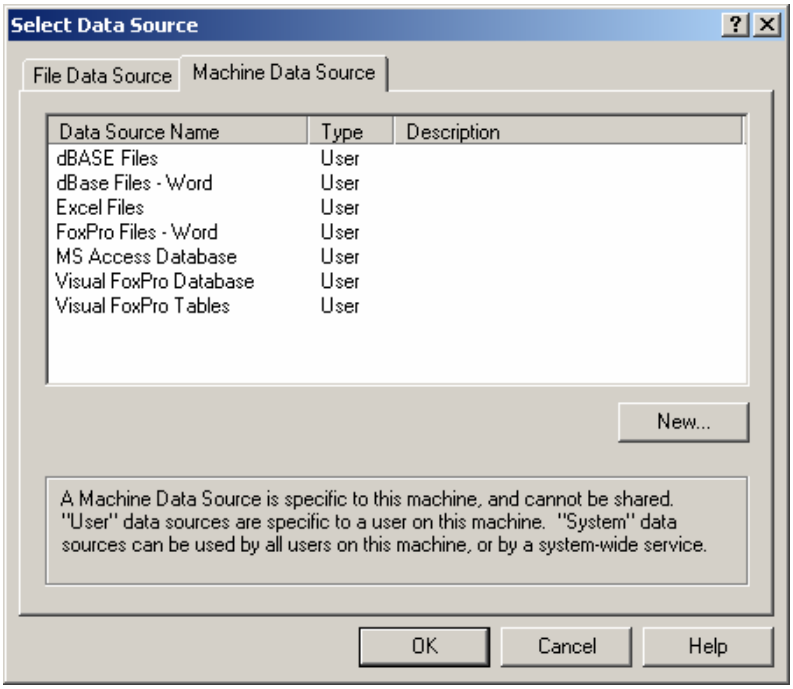
To set up a data-logging source in the Configurator:

1. Click the **...** button in the **ODBC Data Source** field of the **Database Connection** section of the **Database Logging** tab, as shown in the figure below.



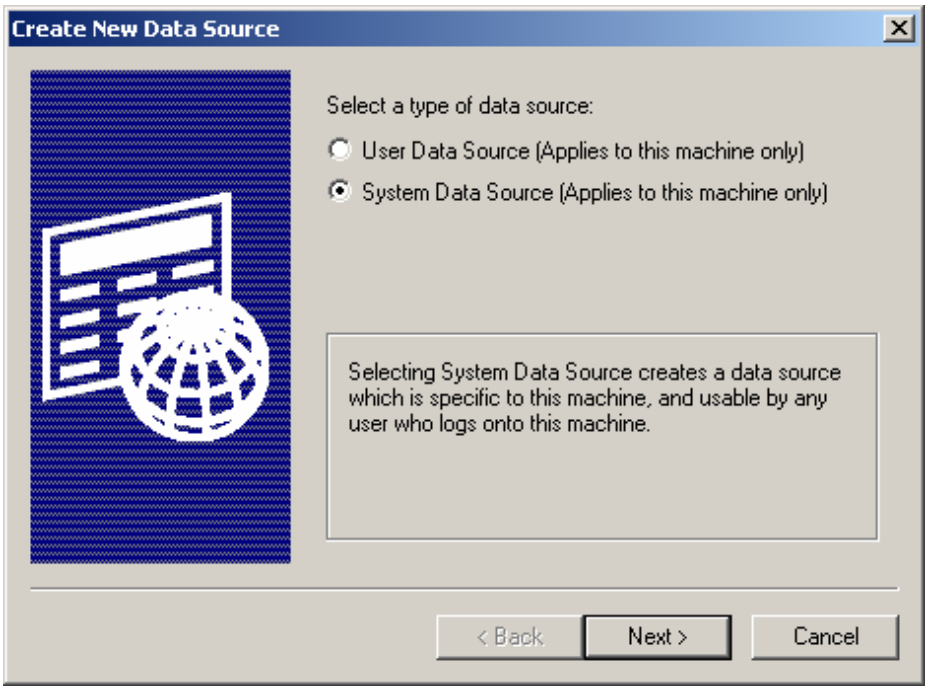
Database Logging: Establishing a Database Connection

2. This opens the **Select Data Source** dialog box, shown below. Choose the **Machine Data Source** tab and an existing database.



Select Data Source Dialog Box

3. Or you can create a new database by clicking **New** in the **Machine Data Source** tab of the **Select Data Source** dialog box. This opens the **Create New Data Source** wizard, shown below, which enables you to configure a new database.



Create New Data Source Wizard

It is recommended that you configure the new database as a **System Data Source** so it is available to any user logged into the specific PC. Click **Next** to select the corresponding ODBC driver, such as Microsoft Access, Microsoft SQL Server, or Oracle.

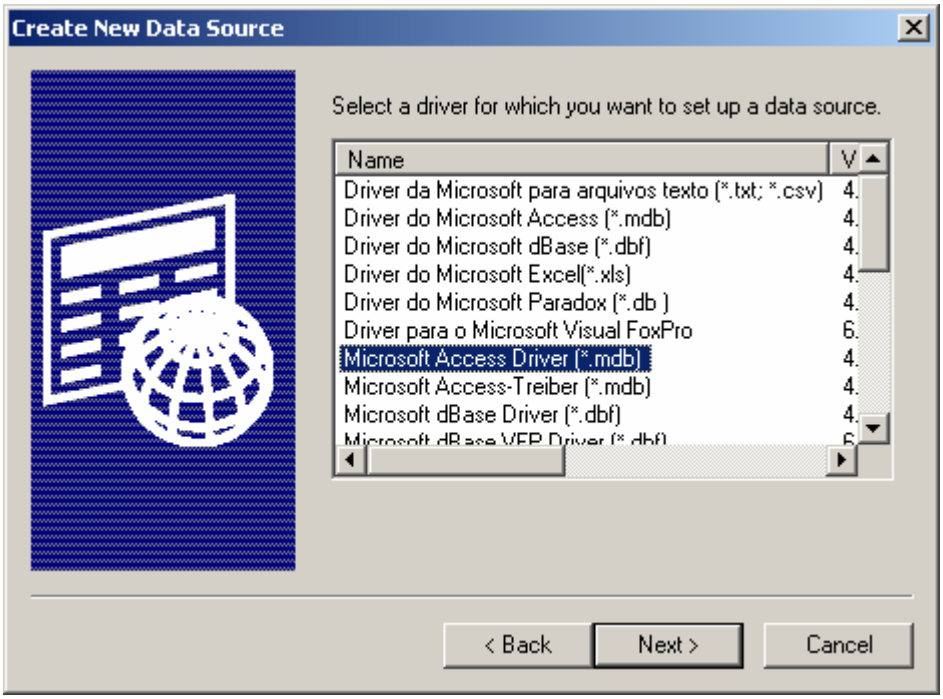
We recommend configuring the new database as a System Data Source so it is available to any user logged on the specific PC station. Next pick the corresponding ODBC driver such as Microsoft Access or SQL Server.

Note: When using a Microsoft SQL Server configuration database, the AlarmWorX Logger will not log any data when the **ODBC Data Source** is set as **Not available - using configuration DB** in the **Database Logging** tab, as shown in the figure above. This setting is designed to be used with a Microsoft Access configuration database.

Configuring Microsoft Access Databases

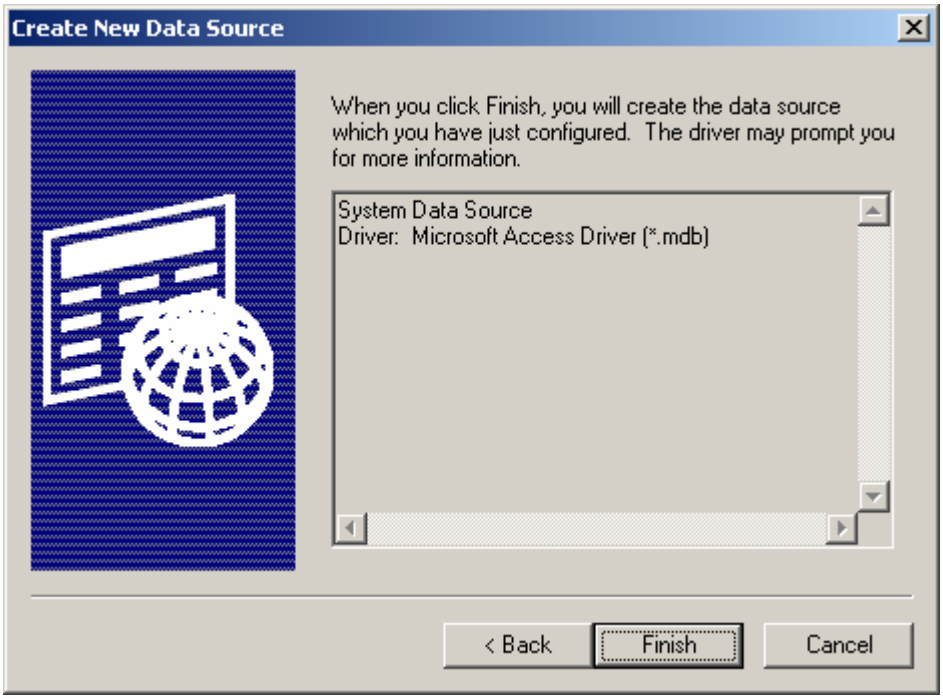
To configure a Microsoft Access database:

1. Select **Microsoft Access Driver** (.mdb) in the **Create New Data Source** wizard, as shown in the figure below.



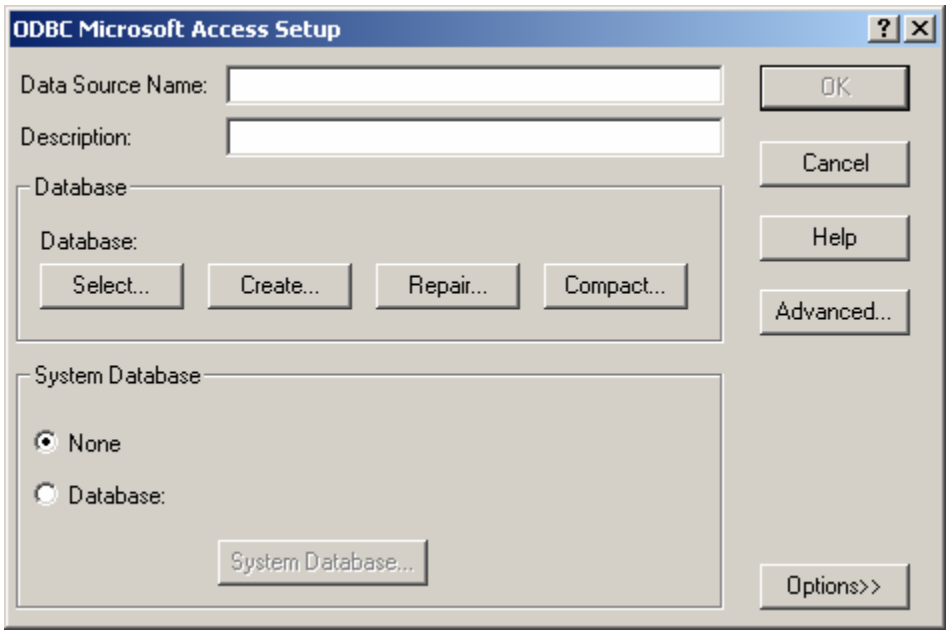
Selecting a Microsoft Access ODBC Driver

2. When you have selected the Microsoft Access driver, click **Next** to proceed to the final dialog box in the **Create New Data Source** wizard, shown below.



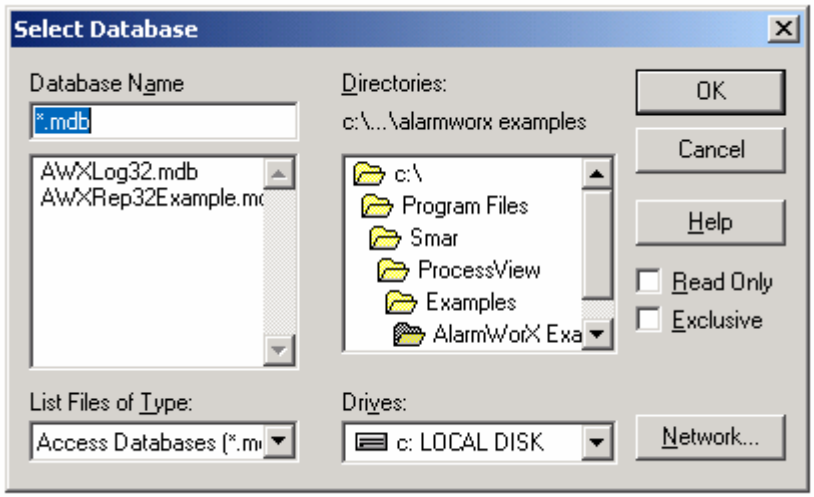
Creating a New Microsoft Access Database Connection

3. Click **Finish** to configure your new Microsoft Access database. This opens the **ODBC Microsoft Access Setup** dialog box, shown below. Enter the **Data Source Name** and the **Description.**



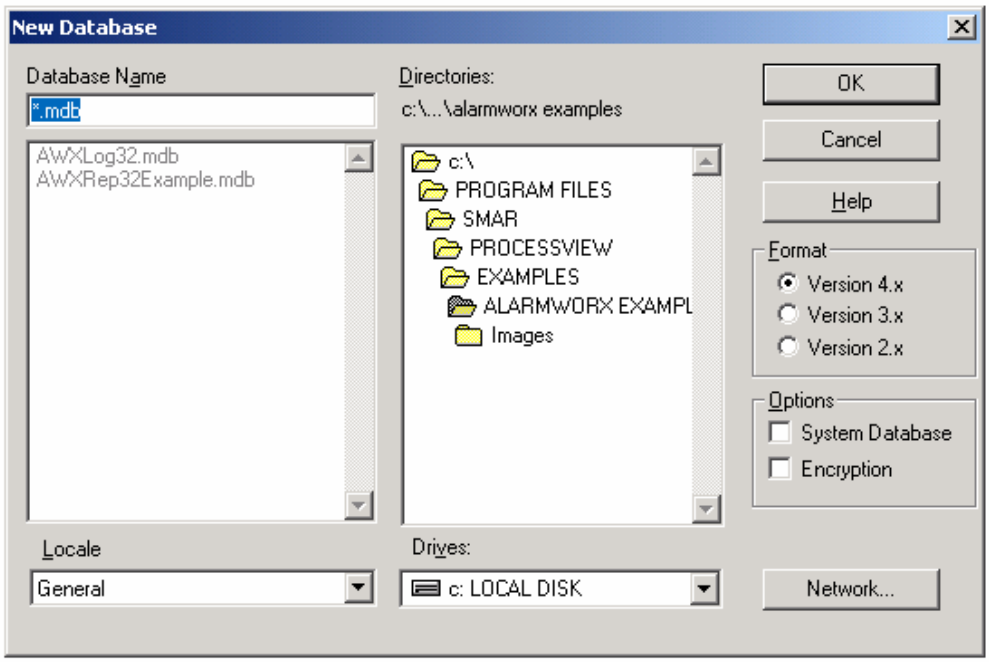
ODBC Microsoft Access Setup Dialog Box

4. Click **Select** to choose an existing .mdb file. This opens the **Select Database** dialog box, shown below.



Selecting an Existing Microsoft Access Database File

5. Click **Create** to create a new .mdb file. This opens the .mdb file directory in the **New Database** dialog box, as shown below.



Creating a New Microsoft Access Database File

6. You can choose a local hard disk or a networked hard disk as the location of your new .mdb file. Click **OK** to exit the configuration and establish the database connection.

Note: When creating a new .mdb file, the Microsoft Access configuration dialog box provides the options of creating a Version 4.x or a Version 3.x compatible .mdb file. By default, Version 4.x is selected, creating a Jet Engine 4.x compatible .mdb file, which can be opened *only* in Microsoft Access 2000. If you have Microsoft Access 97, select the Version 3.x compatibility. In general, Version 4.x is preferred because it offers greater functionality than the older versions.

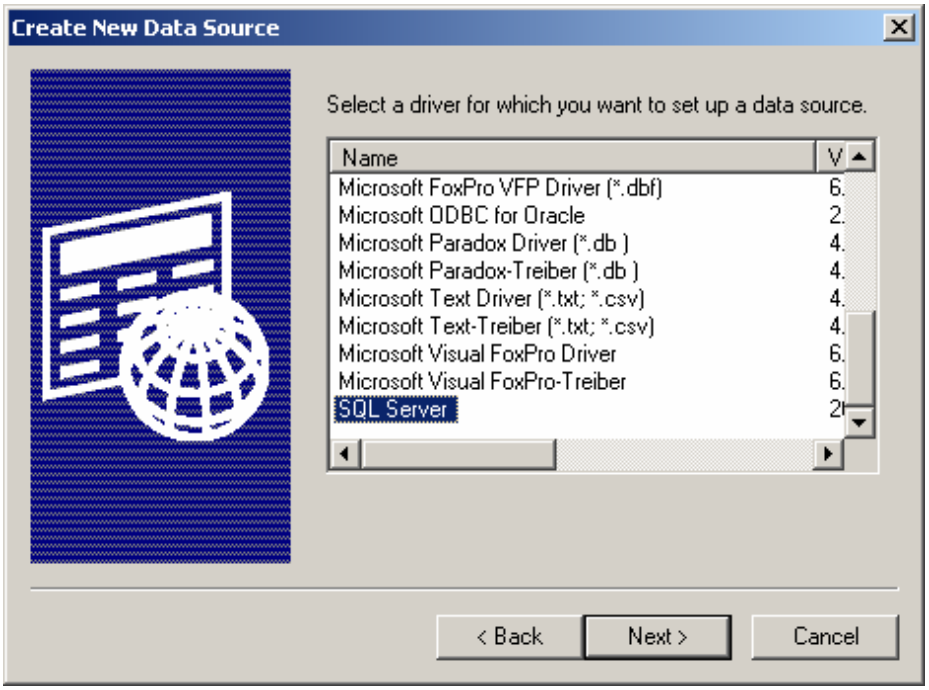
Configuring Microsoft SQL Server and MSDE Databases

The Alarm Logger includes native support for MSDE (Microsoft Data Engine), which is a Microsoft SQL Server 7.0 or 2000 compatible database engine with the following limitations:

- The Maximum database size is 2 GB.
- Performance can decrease if more than five connections are open at one time.

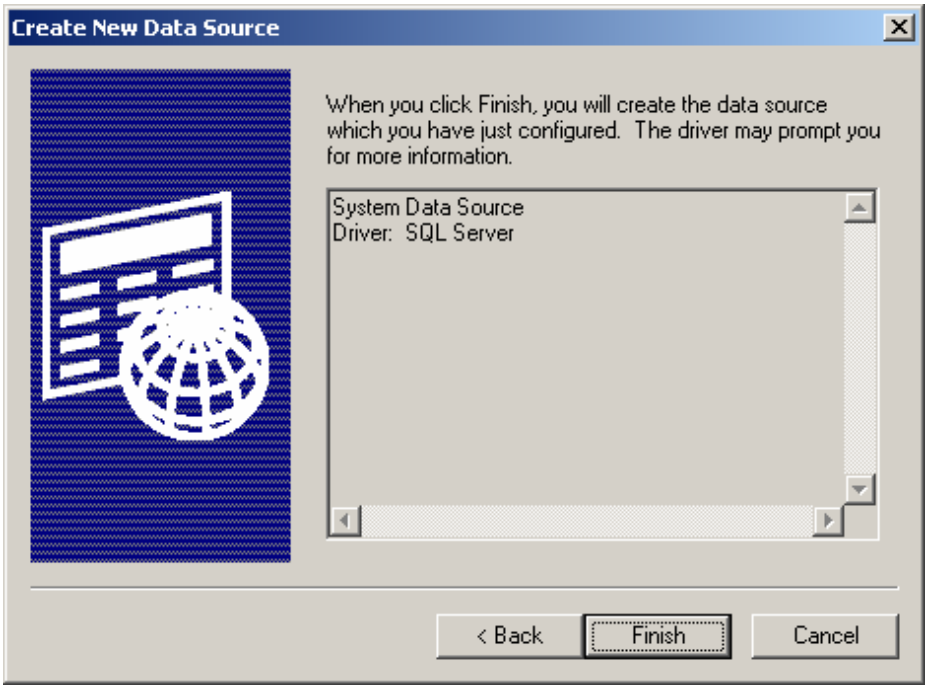
However, MSDE is a Microsoft SQL Server compatible engine that can be directly upgraded to the full Microsoft SQL Server. Thus, database connections to MSDE are identical to the database connections to Microsoft SQL Server.

1. To establish an ODBC connection to this database, when configuring a new ODBC data source for Microsoft SQL Server or MSDE, select the appropriate ODBC driver. To configure a Microsoft SQL Server or MSDE database, select the **SQL Server** driver in the **Create New Data Source** wizard, as shown in the figure below.



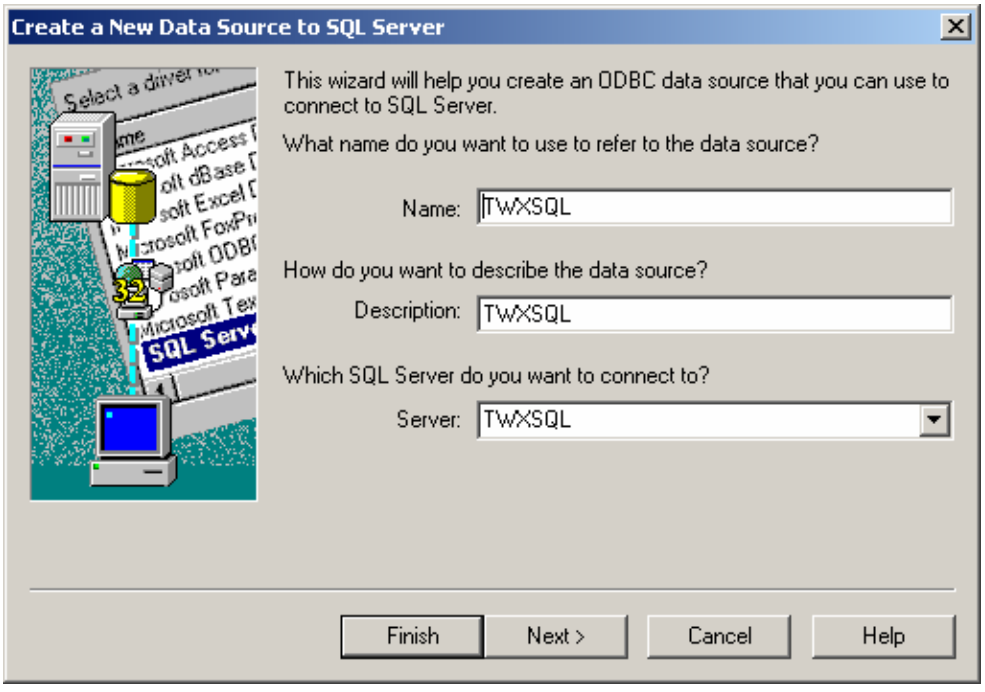
Selecting a Microsoft SQL or MSDE Server ODBC Driver

2. When you have selected the Microsoft SQL Server driver, click **Next** to proceed to the final dialog box in the **Create New Data Source** wizard, shown below.



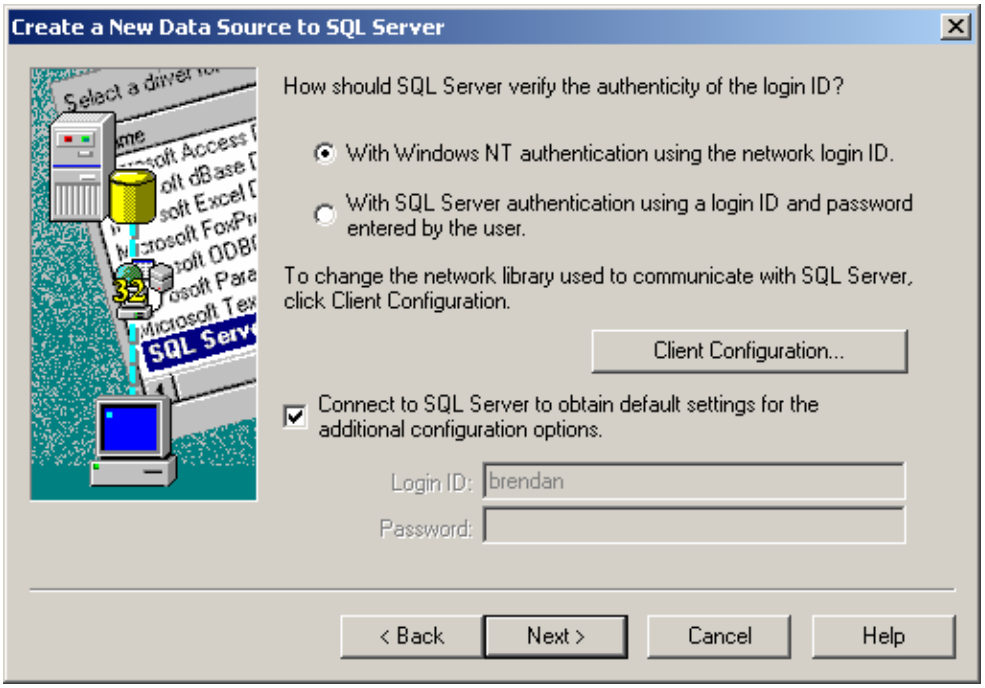
Creating a Microsoft SQL Server or MSDE Database Connection

3. Click **Finish** to configure your new database. This opens the **Create a New Data Source to SQL Server** dialog box, shown below. Enter the **Data Source Name,** the **Description,** and the name of the **Server** on which the Microsoft SQL Server or MSDE engine resides.



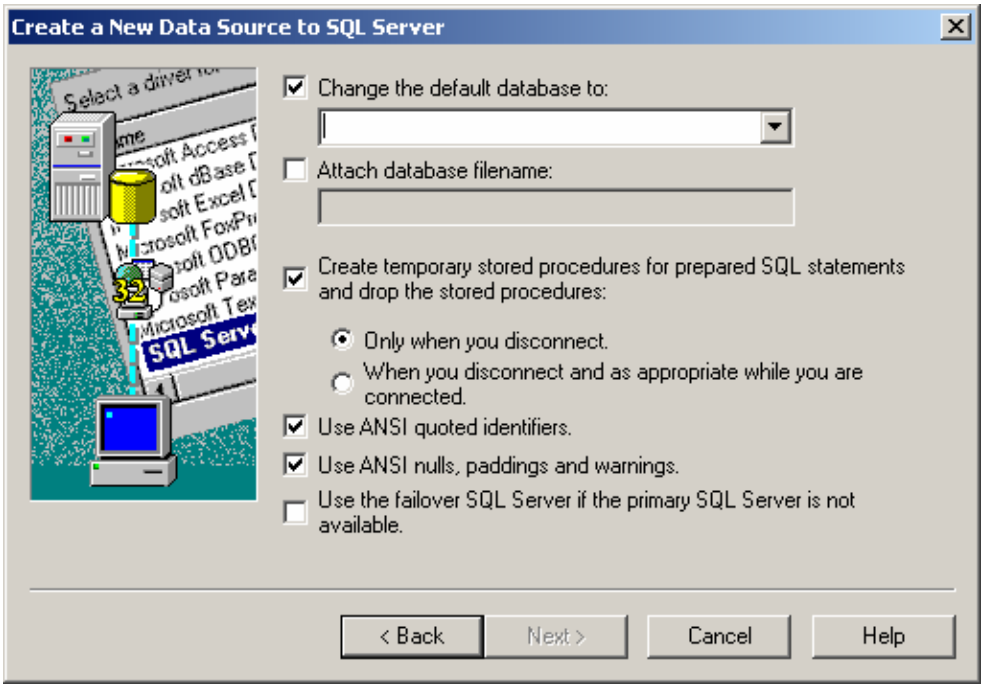
Create a New Data Source to SQL Server Dialog Box

4. If it the engine resides on the same PC node as the AlarmWorX Logger, select "local." Otherwise select or specify the appropriate server name. Click **Next** to continue with the Microsoft SQL Server Security configuration and Connection type. It is recommended that you use the Windows NT authentication mechanism, which eliminates the need for maintaining individual user accounts and passwords.



Configuring a Microsoft SQL or MSDE Database Connection

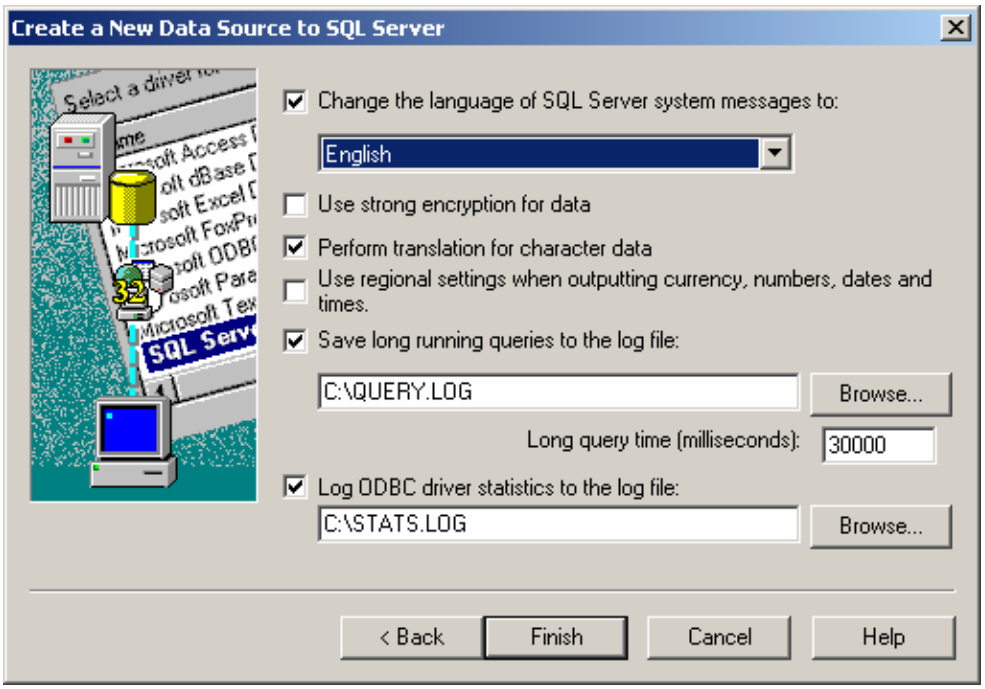
5. Click **Next** to continue with the selection of the default database for the connection. Make sure it is not the master database, but the one created for the purpose of data logging.



Setting the Default Microsoft SQL Server or MSDE Database

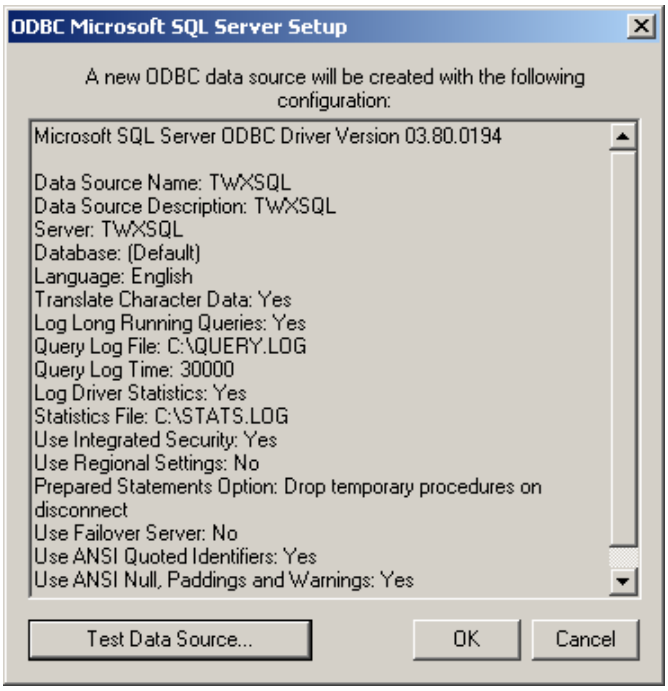
Note: When connecting to an Microsoft SQL Server or MSDE database, make sure that the desired database for historical data logging is selected in the **Change the Default Database** field, as shown in the figure above. Otherwise, you will establish a connection to the master database, which is not recommended.

6. Click **Next** to accept or modify the default settings, as shown in the figure below.



Configuring the Default Settings

7. Complete the connection configuration by clicking **Finish.** It is recommended that you test the established connection by clicking **Test Data Source,** as shown in the figure below.



Testing a Microsoft SQL Server or MSDE Database Connection

Note: Regardless of the database type, all AlarmWorX modules, which interact with databases, will create, modify, drop, and update tables. Therefore, it is critical that the currently logged-in user has permission to perform these tasks.

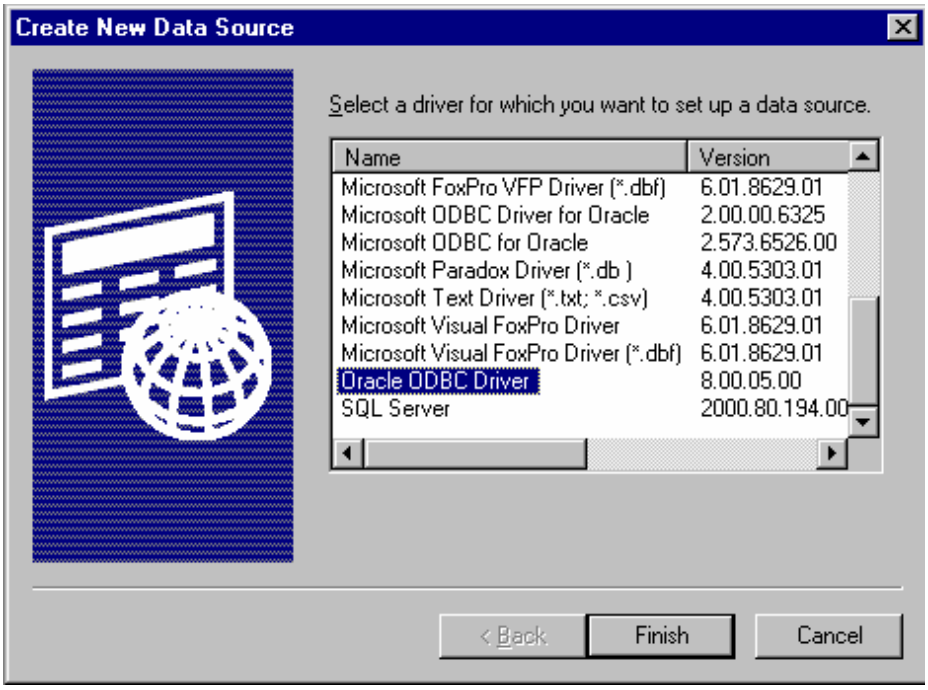
Configuring Oracle Databases

The Alarm Logger includes support for logging data as well as replaying data to and from Oracle databases. The support for Oracle was developed under the assumption that:

- ODBC database connections to Oracle are established using the Oracle ODBC Driver 8.05.60, which is provided by Oracle and is available on the SMAR product CD under the Tools directory.
- Oracle is running on a Microsoft Windows NT station.

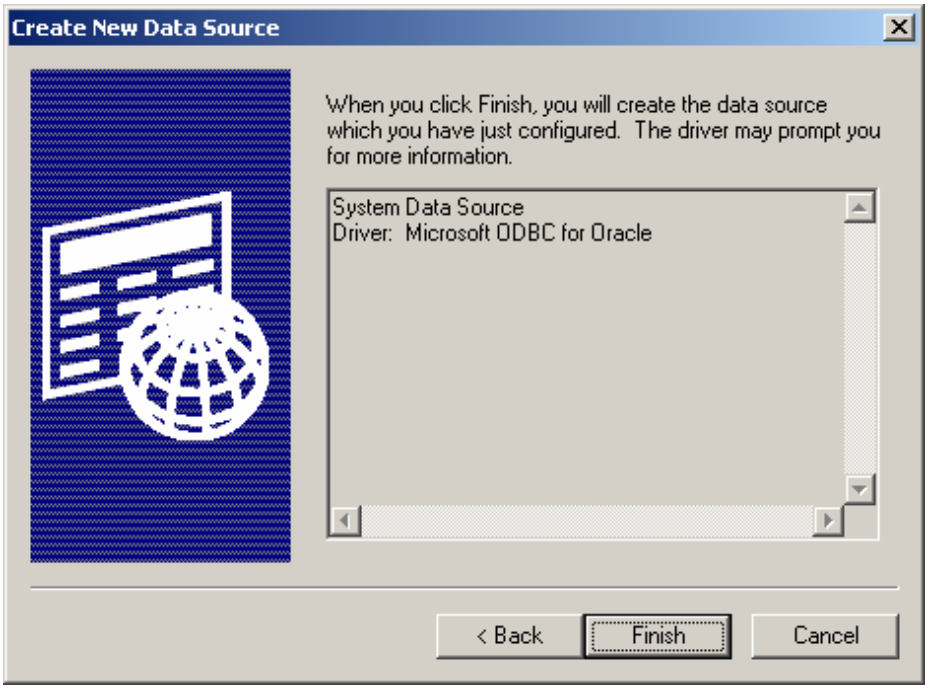
To configure an Oracle database:

1. Select the **Oracle ODBC Driver** in the **Create New Data Source** wizard, as shown in the figure below.



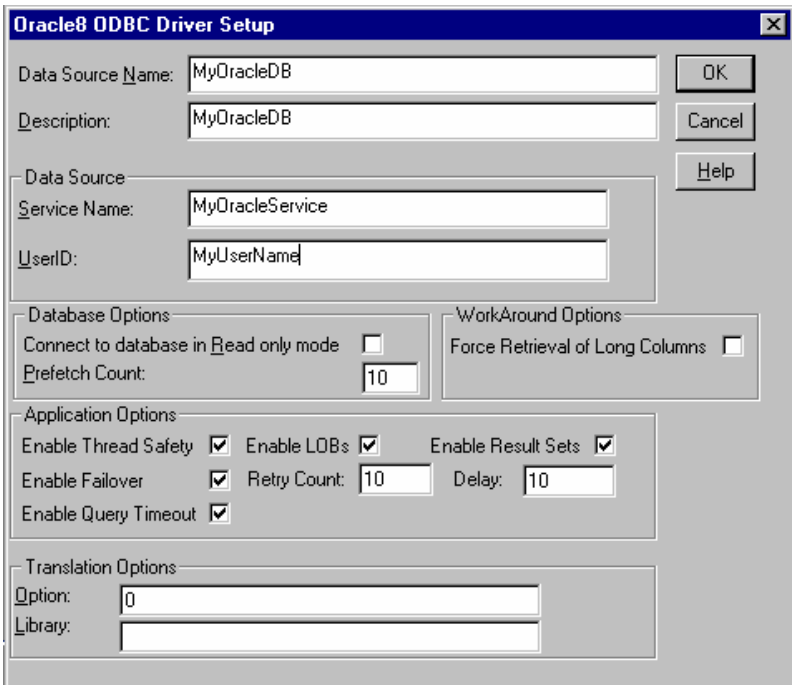
Selecting the Oracle ODBC Driver

2. When you have selected the ODBC for Oracle driver, click **Next** to proceed to the final dialog box in the **Create New Data Source** wizard, shown below.



Creating an Oracle Database Connection

3. Click **Finish** to configure your new database. This opens the **Oracle ODBC Driver Setup** dialog box, shown below. Enter the **Data Source Name,** the **Description,** the **Service Name,** and the **User ID,** and configure the other desired settings.



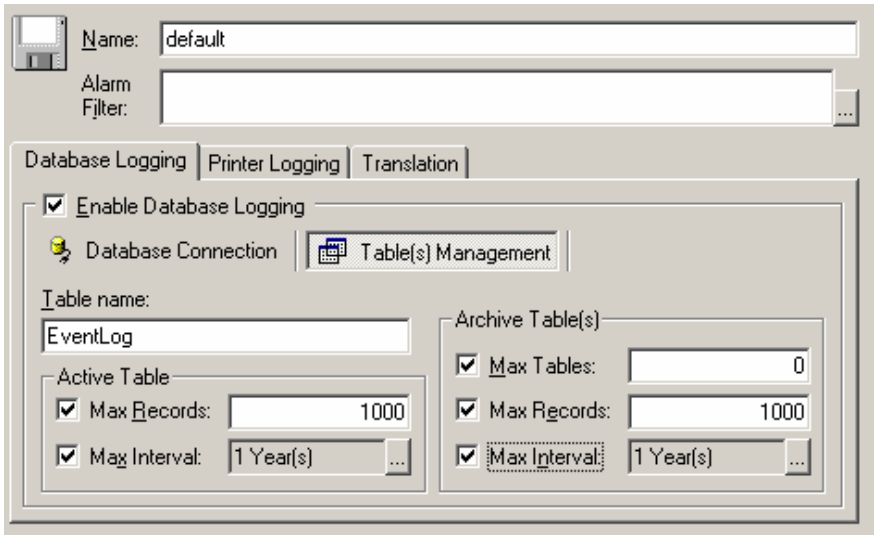
Configuring an Oracle ODBC Database Connection

Table Management

Alarm data are logged to one master active table. If no restrictions are placed on the size of the active table, then logging will continue to go to the active table as long as the Alarm Logger is running. If, however, a restriction is placed on the size of the active table, then all logged data

beyond the active table size will get logged to archive tables. The archive tables also have a maximum size determined by a number of records or time interval. When one archive table is full, archiving goes on to the next table. When all archive tables are full, the oldest archive table is deleted and a new one is set up. The name of each archive table is the name of the active table followed by the date and time of the first alarm in the table. In this system, the Active Table will always have the most recent alarm data.

The **Table Management** section of the **Database Logging** tab, shown in the figure below, configures the following parameters for the active table.



Database Logging: Table Management

Table Name: Enter the name of the active table to log data to.

Active Table: Here you can specify a limit on the active table size. The limit can be by the Maximum Number of Records, or by the Maximum Time Interval (select from hours, days, months, or years by clicking the ... button). If both items are checked, then the table is full when the first of those two conditions is met. The Interval refers to the time difference between the first item logged (not the logging start time) and the most recent item logged. If neither item is checked, then no archiving will take place.

Archive Tables: In this section, you can enter in the quantity of archive tables and the condition(s) upon which each archive table is full.

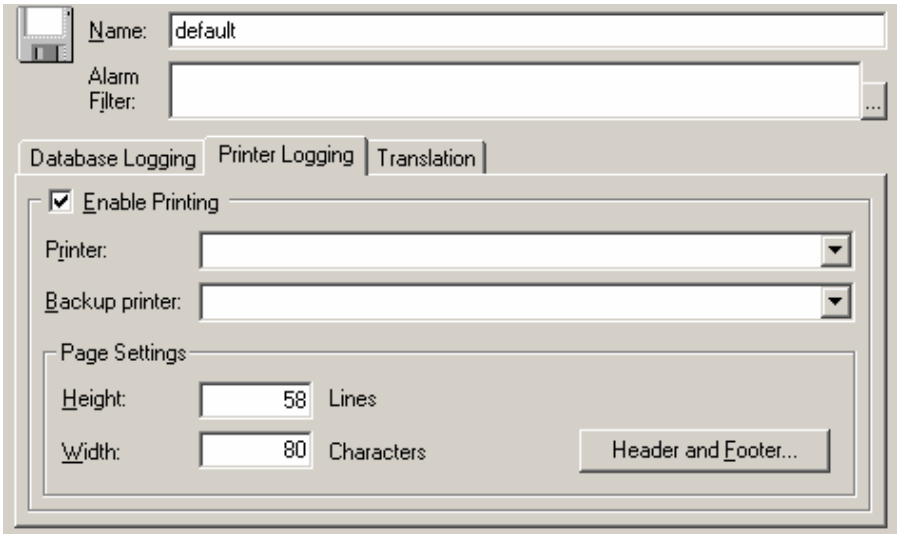
Note: If, in the Archive Table(s) section, the Max Records and Max Interval fields are both left unchecked, then all archiving will go to one archive table of theoretically unlimited length, as no restrictions have been placed on the table size. In essence, the Max Tables field will be ignored.

Note: During runtime, the Alarm Logger will create the active table if it does not exist and will also add any columns to the table if they are missing. The logger will not create any indexes. Use a database administration tool to add indexes to columns that are searched and/or sorted by queries.

Note to Microsoft Access Users: If you are connected to a Microsoft Access data base and you are using archive tables, it is very important to note that, though the archiving deletes the oldest table to make room for a new one when all tables are used up, the disk space taken by the deleted table does not get freed up. The end result is that over a long period of time, the log database file will keep growing in size even though you may have specified a finite quantity of records to archive. One solution to this problem is to periodically open the database in Microsoft Access and select Compact/Repair Access Database from the Tools menu of the Configurator. This frees up unused disk space. It is very important, however, that you make sure that no other users, including the AlarmWorX Alarm Logger, are connected to your database when you use the 'Compact' command. An alternative solution is to use SQL or MSDE for your data logging instead of Microsoft Access.

Printer Logging Tab

Checking the **Enable Printing** check box on the **Printer Logging** tab of the configuration properties, shown in the figure below, causes the Alarm Logger to type event records to the printer(s) specified in the following fields.



Printer Logging Tab

Printer: Select the **Primary Printer** from the drop-down list. The AlarmWorX Logger sends each event directly to the printer as soon as it is received. This works best with a dedicated ink jet or dot matrix printer that will print one line at a time, rather than a page-oriented printer like a laser printer. Laser printers will still work, but the page will not be ejected until it is full.

All event notifications will print on the Primary Printer unless an error is detected (offline, out of paper, etc.), in which case the Backup Printer will be used. Switchover from Backup to Primary occurs automatically when the error condition is cleared on the Primary Printer.

Backup Printer: Select the **Backup Printer** from the drop-down list. The Backup Printer will be used whenever an error is detected (offline, out of paper, etc.) on the Primary Printer. Switchover from Backup to Primary occurs automatically when the error condition is cleared on the Primary Printer.

Height: Enter the number of lines your printer prints on a single page using its default font. The logger prints events "one line at a time," by sending raw text to the printer, bypassing the normal Windows page device context printing. Printers that accept this raw text will use an internal font to render the characters. The number of lines that will fit on a page using this internal font needs to be entered here. If you cannot find this information in the printer manual, you may need to experiment to find an acceptable value. A value of 58 will be safe for most printers.

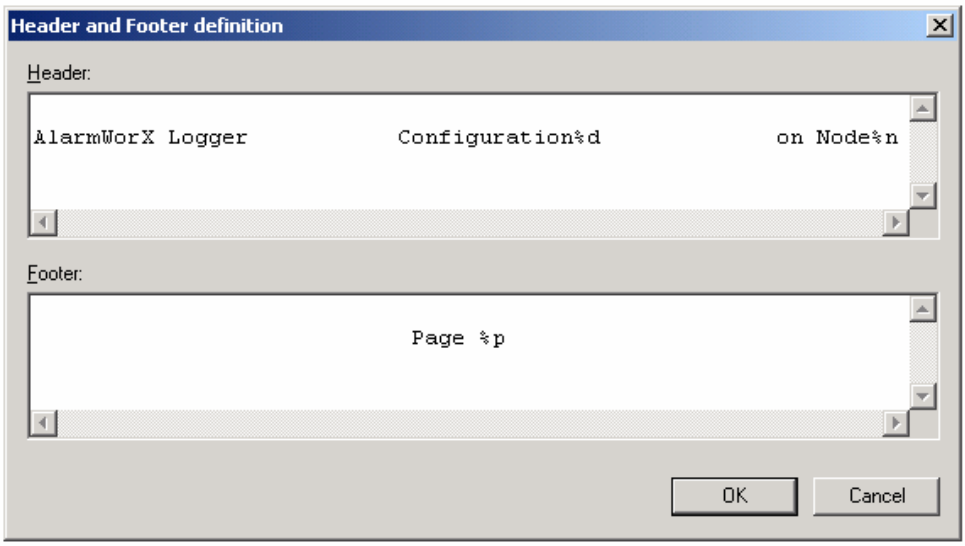
Width: Enter the number of characters the printer is capable of printing on a single line using its default font.

Header and Footer Button: Click the **Header and Footer** button to edit the lines of text that will appear at the top and bottom of each printed page. The header and footer may contain more than one line. The following tokens will be replaced at runtime with their appropriate values:

%d - Name of the configuration.

%n - Computer name the logger is running on.

%p - Page number.



Header and Footer Dialog

International Language Printing

The AlarmWorX Logger supports printing using character sets other than the standard 7-bit ASCII codes appropriate for English. Since the logger does not use normal “Windows” printing, the setup to use other character sets is more involved than for other typical Windows programs.

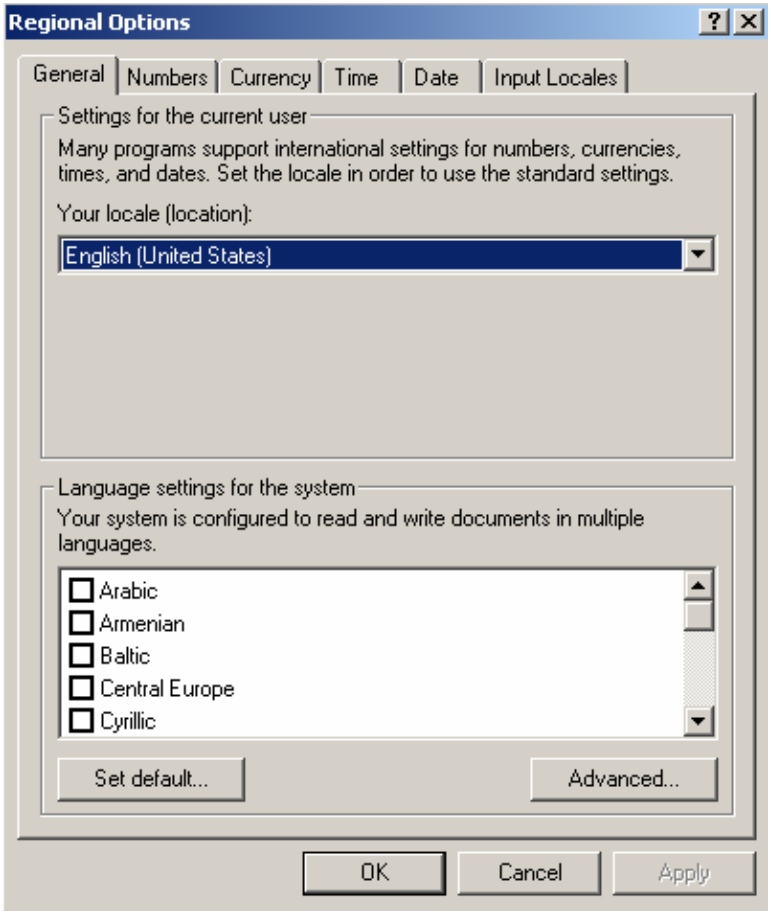
Selecting the Windows Regional Options

First select the desired locale and Language from the Windows Control Panel “Regional Settings”:

1. From the Windows **Start** menu, select **Settings > Control Panel.**

2. In the Control Panel, double-click on **Regional Options.** This opens the **Regional Options** dialog box, as shown in the figure below. On the **General** tab, select the desired locale and Language, as shown in the figure below.

Note: You must set the desired language in the Windows Regional Settings. It is not enough to choose the language only within ProcessView.



Setting the Windows Regional Language Options

Selecting the Character Set (Code Page) in the Printer

By selecting the desired language in Windows, the Logger will convert the UNICODE characters to the 8-bit ASCII version using the DOS code page for the selected language. In order for the characters to print properly, the printer must be configured to use the correct code page.

The code page for the printer is selected by sending the printer special non-printable ASCII characters called control codes. The control codes are listed in the first column (Decimal 0 - 31) of the ASCII chart below.

Ctrl	Dec	Hex	Char	Code
^@	0	00		NUL
^A	1	01	☺	SOH
^B	2	02	☻	SIX
^C	3	03	♥	EIX
^D	4	04	♦	EOI
^E	5	05	♣	ENQ
^F	6	06	♠	ACK
^G	7	07	•	BEL
^H	8	08	◘	BS
^I	9	09	○	HI
^J	10	0A	◙	LF
^K	11	0B	♂	VI
^L	12	0C	♀	FF
^M	13	0D	♪	CR
^N	14	0E	♫	SO
^O	15	0F	☼	SI
^P	16	10	►	SLE
^Q	17	11	◄	CS1
^R	18	12	↕	DC2
^S	19	13	‼	DC3
^T	20	14	¶	DC4
^U	21	15	§	NAK
^V	22	16	▬	SYN
^W	23	17	↨	EIB
^X	24	18	↑	CAN
^Y	25	19	↓	EM
^Z	26	1A	→	SIB
^[	27	1B	←	ESC
^\	28	1C	∟	FS
^]	29	1D	↔	GS
^^	30	1E	▲	RS
^_	31	1F	▼	US

Dec	Hex	Char
32	20	sp
33	21	!
34	22	"
35	23	#
36	24	$
37	25	%
38	26	&
39	27	'
40	28	(
41	29	)
42	2A	*
43	2B	+
44	2C	,
45	2D	-
46	2E	.
47	2F	/
48	30	0
49	31	1
50	32	2
51	33	3
52	34	4
53	35	5
54	36	6
55	37	7
56	38	8
57	39	9
58	3A	:
59	3B	;
60	3C	<
61	3D	=
62	3E	>
63	3F	?

Dec	Hex	Char
64	40	@
65	41	A
66	42	B
67	43	C
68	44	D
69	45	E
70	46	F
71	47	G
72	48	H
73	49	I
74	4A	J
75	4B	K
76	4C	L
77	4D	M
78	4E	N
79	4F	O
80	50	P
81	51	Q
82	52	R
83	53	S
84	54	T
85	55	U
86	56	V
87	57	W
88	58	X
89	59	Y
90	5A	Z
91	5B	[
92	5C	\
93	5D	]
94	5E	^
95	5F	_

Dec	Hex	Char
96	60	`
97	61	a
98	62	b
99	63	c
100	64	d
101	65	e
102	66	f
103	67	g
104	68	h
105	69	i
106	6A	j
107	6B	k
108	6C	l
109	6D	m
110	6E	n
111	6F	o
112	70	p
113	71	q
114	72	r
115	73	s
116	74	t
117	75	u
118	76	v
119	77	w
120	78	x
121	79	y
122	7A	z
123	7B	{
124	7C	|
125	7D	}
126	7E	~
127	7F	⌂†

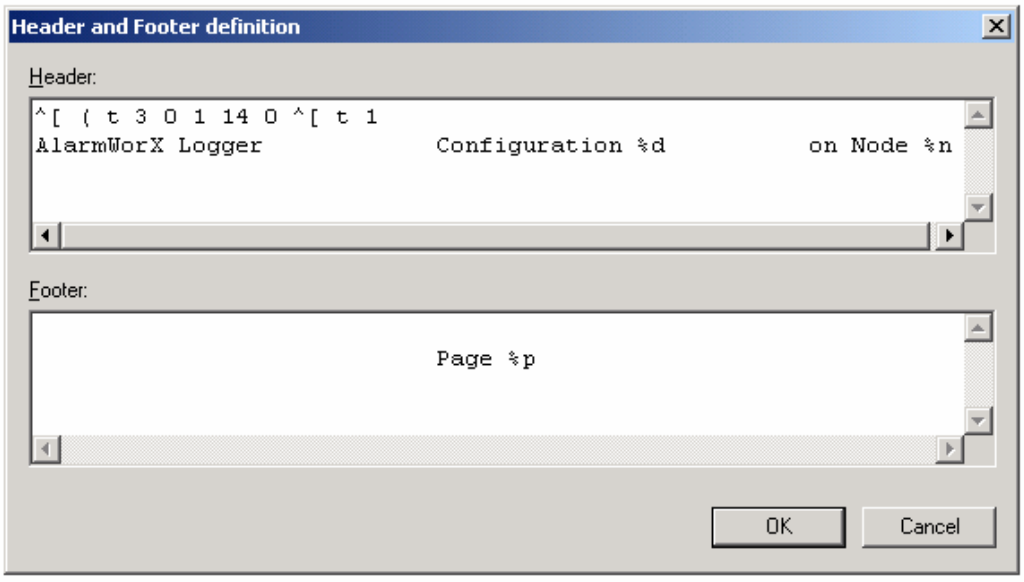
† ASCII code 127 has the code DEL. Under MS-DOS, this code has the same effect as ASCII 8 (BS). The DEL code can be generated by the CTRL + BKSP key.

The configuration of the header and footer for the printed alarms understands the ASCII control codes so for example the character sequence ^[will be interpreted as the ESC code (Decimal 27) instead of the two literal characters ^ and [.

The proper control code sequence to select a particular language varies by printer manufacturer and model. Please refer to the printer manual for your printer to obtain the correct code sequence. For example, the following sequence will assign the PC866 Russian code page to character table 1 and then make character table 1 active for International (non-US) Epson printers:

^[(t 3 0 1 14 0 ^[t 1

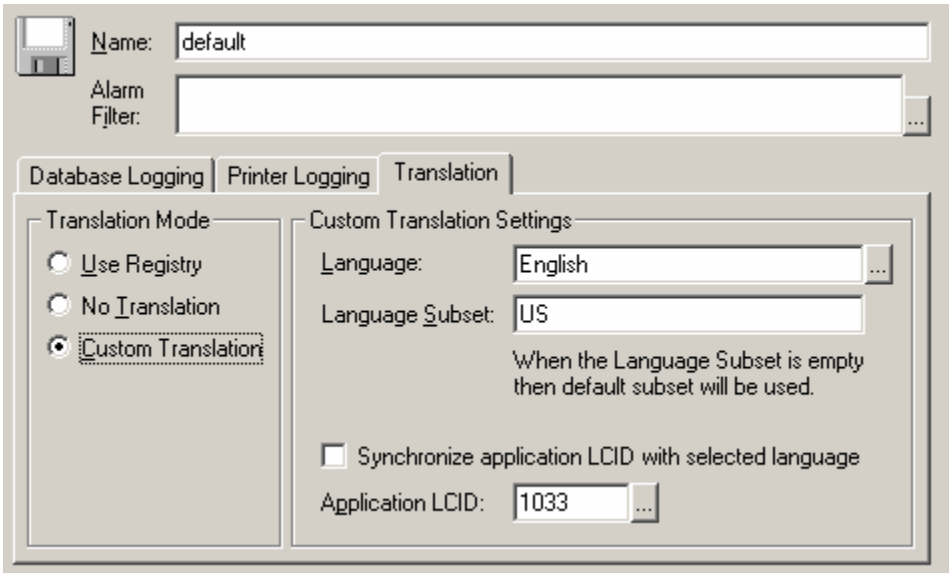
The same code sequence is shown below in the header configuration of the AlarmWorX Logger. To view the header configuration, click the **Header and Footer** button on the **Printer Logging** tab of the AlarmWorX Logger Configurator.



Code Sequence Displayed in Printer Header Configuration

Translation Tab

The **Translation** tab of the configuration properties, shown in the figure below, will appear only if you have the version of AlarmWorX with Language Switching installed (Unicode Version only). It is for use with the language translations as configured in the Language Configurator.



Translation Tab

Translation Mode allows you to choose how you would like Language Switching to work with the Alarm Logger for this particular configuration.

Use Registry: This mode uses the registry settings to determine what language to use. This means that if a user changes the language in another application, the Alarm Logger will also use the new language.

No Translation: This mode does not allow for the language to be translated before getting logged. If you have items configured with special characters for use with Language Switching, they will remain with the items and be logged in this way. This is useful if you would like the next phase, such as reporting, to be able to determine which language translation to use.

Custom Translation: This mode allows you to set the language translation here so that it will always be the language used with the Alarm Logger for this particular configuration. The following Custom Translation Settings are available for use with this mode:

- **Language:** Choose the language you wish to use from the list of available languages as configured in the Language Configurator.
- **Language Subset:** If you are using a language subset, enter it here. It must be a language subset that has been defined in the Language Configurator.
- **Synchronize application LCID with selected language:** If using application language converting also, you can synchronize with language switching by checking this check box.
- **Application LCID:** Allows you to choose a language to use for application language converting. This option is only available for use with languages that have alternate language resources (dynamic link libraries) associated with them. See the document 'International ToolworX.doc' on your Smar CD for more information. It can be found in the CD directory in the Tools folder under Translations.

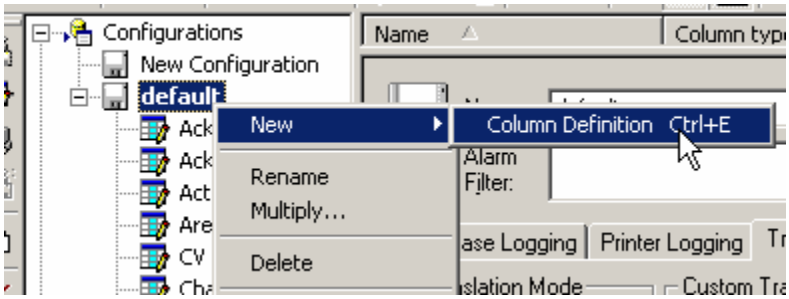
Columns

Each configuration contains one or more columns. The columns defined for a configuration appear as child elements of the configuration in the tree control, and as list items in the list view (top right pane).

Creating a New Column

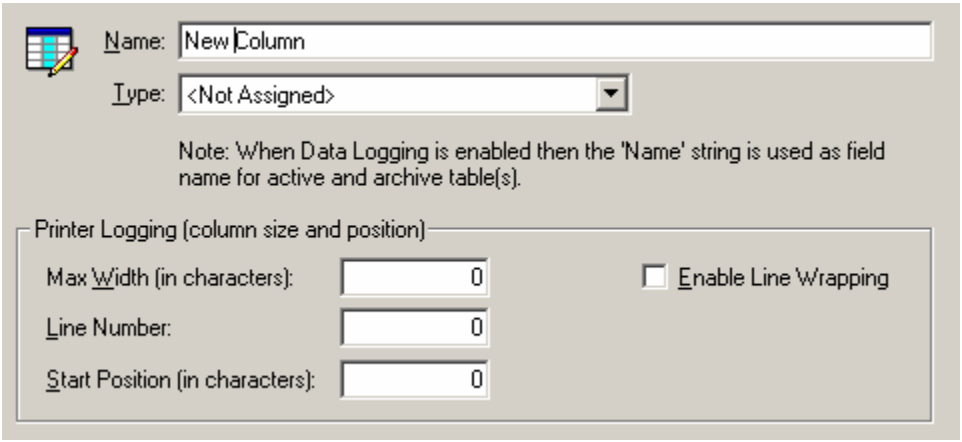
To create a new column:

1. Right-click on a logger configuration in the tree control of the Configurator and select **New > Column Definition** from the pop-up menu, as shown in the figure below.



Creating a New Column

2. The properties dialog box for the new tag appears in the right-hand pane of the Configurator, as shown in the figure below.

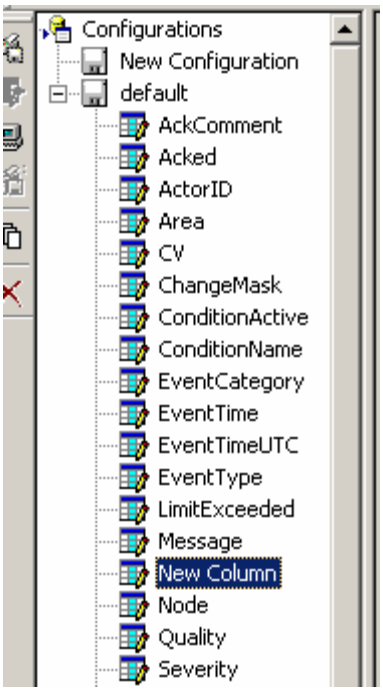


Setting the Properties for the New Column

3. In the **Name** field, type a name for the new column. This will be the column name used in the logging database and the column heading when printing.

4. In the **Type** field, select a column type from the drop-down list.

5. When you have finished configuring the column properties, click the **Apply** button. The new tag appears under the Logger Configuration tree control, as shown in the figure below.

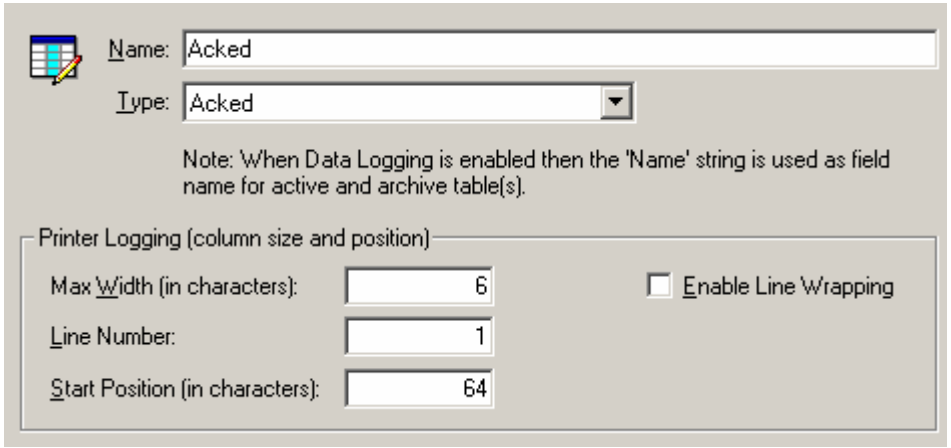


New Column Added to Tree Control

Column Configuration Properties

Configure the following parameters for columns, as shown in the figure below.

Note: If **Dialog View** is not selected from the **View** menu, you will not see the configuration properties.



Column Configuration Properties

The following fields are specified for each column:

Name: Enter the name of the column. This will be the column name used in the logging database and the column heading when printing.

Maximum Width: Enter the number of character spaces for this column when printing.

Line Number: When printing, each event may occupy more than one printed line. Specify the line on which you want the column to print. A value of zero will prevents the column from printing.

Start Position: Enter the number of character spaces from the left to begin printing. The first character space is zero.

Enable Line Wrapping: When printing, field data that are wider than the configured column width will either be truncated or wrapped to the next line depending on this setting.

Column Type: Select the OPC Alarm and Events data item you wish to log in this column from the drop-down list.

The available column types are listed in the table below.

Note: The following column type descriptions are taken directly from the OPC Alarms and Events Specifications. Please refer to the Specifications for complete information.

COLUMN TYPE	DESCRIPTION
	The following items are present for all event types.
Source	The source of event notification. This Source can be used in the IOPCEventServer::TranslateToItemIDs method to determine any related OPC Data Access itemIDs.
Time	Time of the event occurrence. For conditions, time that the condition transitioned into the new state or sub-condition. For example, if the event notification is for acknowledgment of a condition, this would be the time that the condition became acknowledged.
Active Time	Array of active times corresponding to each Source and ConditionName pair. This parameter uniquely identifies a specific transition of the condition to the active state or into a different sub-condition and is the same as the SubCondLastActive condition attribute. Active times are passed to the client in the ActiveTime member of the ONEVENTSTRUCT by the IOPCEventSink::OnEvent callback. If the condition has become active again or transitioned into a different sub-condition at a later time, this acknowledgment will be ignored.
Message	Event notification message describing the event.
Subscription	Subscription to a given OPC Alarm and Event server.
Server Description	Information about the currently subscribed OPC Alarm and Event server.
Server Node	Node (computer) on which the currently subscribed OPC Alarm and Event server is located.
Event Type	OPC_SIMPLE_EVENT, OPC_CONDITION_EVENT, or OPC_TRACKING_EVENT for Simple, Condition-Related, or Tracking events, respectively.
Event Category	Event categories define groupings of events supported by an OPC Event server. Examples of event categories might include “Process Events”, “System Events”, or “Batch Events”. Event categories may be defined for all event types, i.e. Simple, Tracking, and Condition-Related. However, a particular event category can include events of only one type. A given Source may generate events for multiple event categories. Names of event categories must be unique within the event server. The definition of event categories is server-specific.
Severity	Event severity (0-1000). The severity value is an indication of the urgency of the sub-condition. This is also commonly called ‘priority’, especially in relation to process alarms. Values will range from 1 to 1000, with 1 being the lowest severity and 1000 being the highest. Typically, a severity of 1 would indicate in event that is informational in nature, while a value of 1000 would indicate an event of catastrophic nature which could potentially result in severe financial loss or loss of life.
Number Event Attributes	The length of the specific event attribute array.
Attributes 1-20	User-specified event attributes.
	The following items are present only for condition-related events.
Condition Name	The name of the condition related to this event notification.
SubCondition Name	The name of the current sub-condition, for multi-state conditions. For a single-state condition, this contains the condition name.
Change Mask	Indicates to the client which properties of the condition have changed to have caused the server to send the event notification. It may have one or more of the following values: OPC_CHANGE_ACTIVE_STATE OPC_CHANGE_ACK_STATE OPC_CHANGE_ENABLE_STATE OPC_CHANGE_QUALITY OPC_CHANGE_SEVERITY OPC_CHANGE_SUBCONDITION OPC_CHANGE_MESSAGE OPC_CHANGE_ATTRIBUTE If the event notification is the result of a Refresh, these bits are to be ignored. For a “new event”, OPC_CHANGE_ACTIVE_STATE is the only bit that will always be set. Other values are server-specific. (A “new event” is any event resulting from the related condition leaving the Inactive and Acknowledged state.)
NewState	A WORD bit mask of three bits specifying the new state of the condition: OPC_CONDITION_ACTIVE, OPC_CONDITION_ENABLED, OPC_CONDITION_ACKED.

COLUMN TYPE	DESCRIPTION
Quality	Quality associated with the condition state. Values are as defined for the OPC Quality Flags in the OPC Data Access Server specification.
AckRequired	This flag indicates that the related condition requires acknowledgment of this event. The determination of those events that require acknowledgment is server-specific. For example, transition into a LimitAlarm condition would likely require an acknowledgment, while the event notification of the resulting acknowledgment would likely not require an acknowledgment.
Active Time	Time that the condition became active (for single-state conditions), or the time of the transition into the current sub-condition (for multi-state conditions). This time is used by the client when acknowledging the condition (see IOPCEventServer::AckCondition method).
Cookie	Server-defined cookie associated with the event notification. This value is used by the client when acknowledging the condition (see IOPCEventServer::AckCondition method). This value is opaque to the client.
	The following is used only for tracking events and for condition-related events that are acknowledgment notifications.
ActorID	For tracking events, this is the actor ID for the event notification. For condition-related events, this is the AcknowledgerID when OPC_CONDITION_ACKED is set in NewState. If the AcknowledgerID is a NULL string, the event was automatically acknowledged by the server. For other events, the value is a pointer to a NULL string.

Event Type Values

Event Type	Value	Description
OPC_SIMPLE_EVENT	1	Simple event.
OPC_TRACKING_EVENT	2	Tracking event.
OPC_CONDITION_EVENT	4	Condition-Related event.

Change Mask Values

Change Mask Item	Value	Description
OPC_CHANGE_ACTIVE_STATE	1	The condition's active state has changed.
OPC_CHANGE_ACK_STATE	2	The condition's acknowledgment state has changed.
OPC_CHANGE_ENABLE_STATE	4	The condition's enabled state has changed.
OPC_CHANGE_QUALITY	8	The ConditionQuality has changed.
OPC_CHANGE_SEVERITY	16	The severity level has changed.
OPC_CHANGE_SUBCONDITION	32	The condition has transitioned into a new sub-condition.
OPC_CHANGE_MESSAGE	64	The event message has changed (compared to prior event notifications related to this condition).
OPC_CHANGE_ATTRIBUTE	128	One or more event attributes have changed (compared to prior event notifications related to this condition).

New State Values

New State	Value	Description
OPC_CONDITION_ENABLED	1	The condition has been enabled.
OPC_CONDITION_ACTIVE	2	The condition has become active.
OPC_CONDITION_ACKED	4	The condition has been acknowledged.

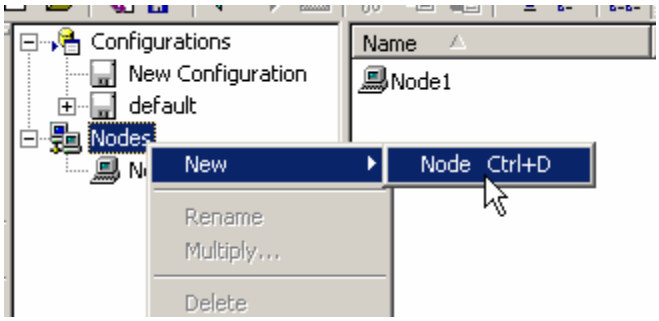
Nodes

Each **Node** represents a computer on the network that is configured to run one or more of the named logger configurations in the active configuration database. When the logger executable is run, it looks for its network computer name in the list of nodes to determine which logger configuration(s) to run. If a logger cannot find its computer name in the list of nodes, it will run the default configuration.

Adding a New Node

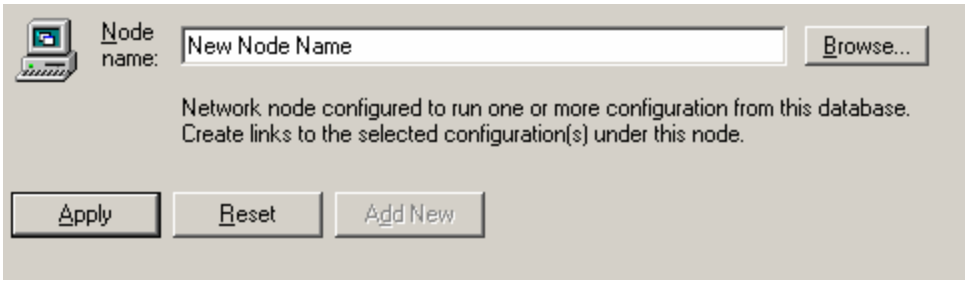
To add a new node to the configuration:

1. Right-click on the **Nodes** tree control of the Configurator and select **New > Node** from the pop-up menu, as shown in the figure below.



Creating a New Node

2. The properties dialog box for the new node appears in the right-hand pane of the Configurator, as shown in the figure below.



Setting the Properties for the New Node

3. In the **Name** field, type a name for the new node, or click the **Browse** button to select a node from the network.

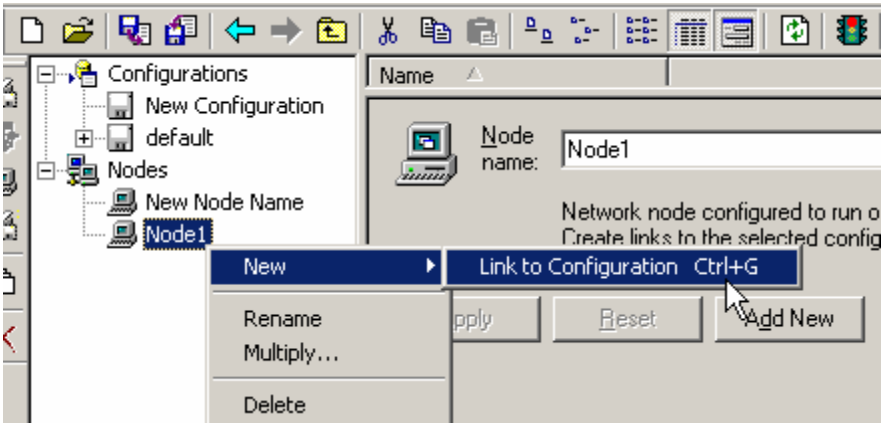
4. When you have finished configuring the nodes, click the **Apply** button. The new area appears under the **Nodes** tree control.

Assigning Configurations to Nodes

Each node has one or more configurations assigned to it. The configurations assigned to a node appear as child elements of the node in the tree control, and as list items in the list view (top right pane). A configuration may be assigned to more than one node.

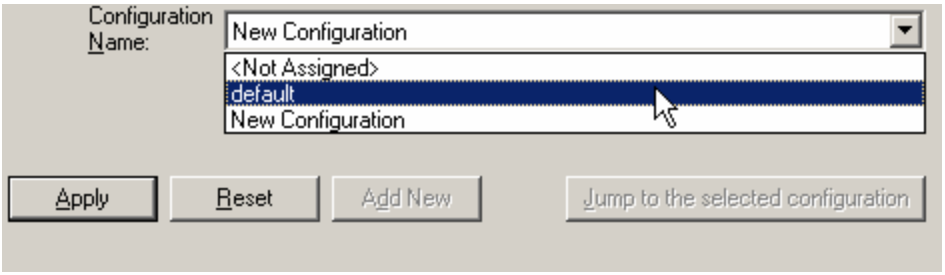
To assign a configuration to a node,

1. Right-click on the **Nodes** tree control of the Configurator and select **New > Link to Configuration** from the pop-up menu, as shown in the figure below.



Linking a Configuration to a Node

2. From the drop-down list under **Configuration Name,** select an existing configuration to assign to this node, as shown in the figure below.



Assigning a Configuration to a Node

3. Click the **Apply** button.

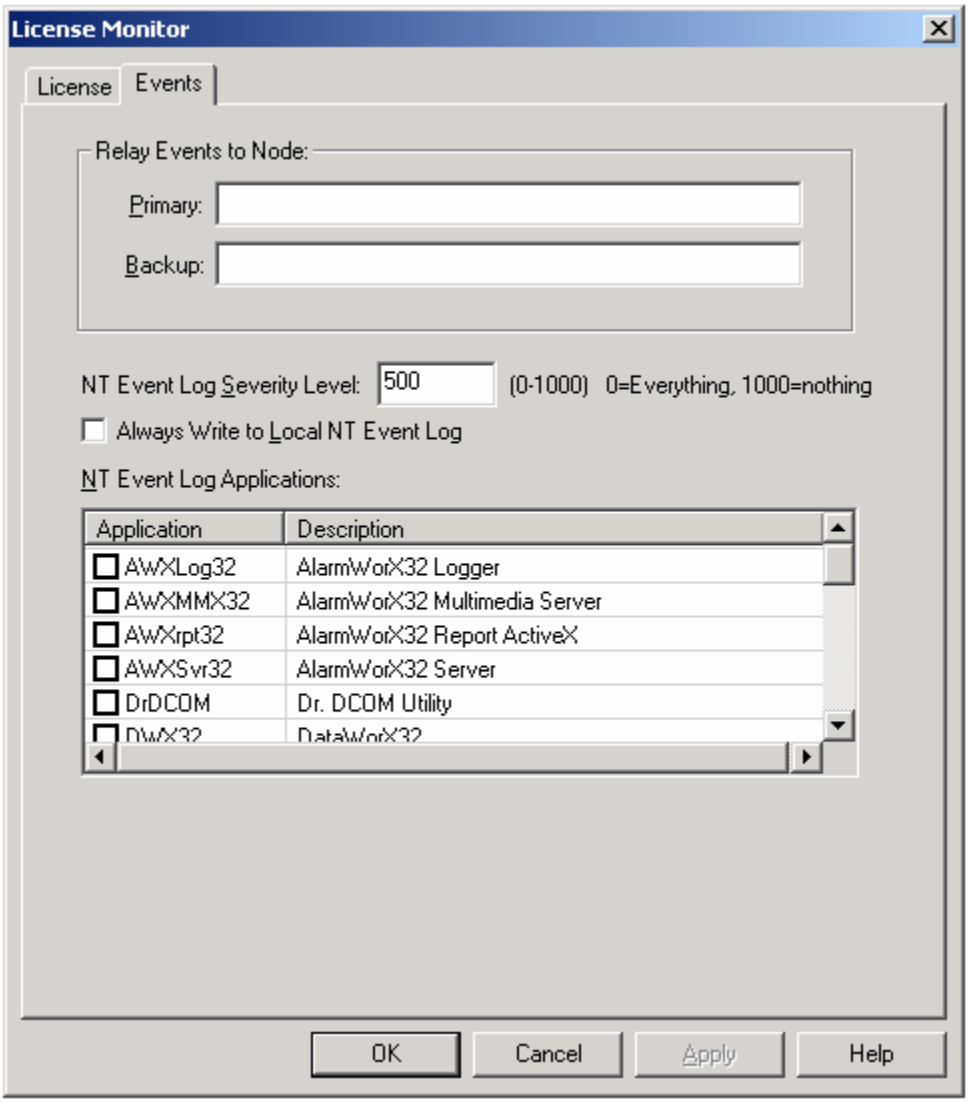
Running the Logger

The Alarm Logger application (AWXLog.exe) that provides the runtime storage and printing has no user interface and may optionally be run as a service on Windows NT (see the installation section). The logger reads its configuration information from a Microsoft Access database file. The logger reads the configuration for the active database only. To activate a database, select **Make Active** from the **File** menu in the Logger Configurator.

Possible Runtime Errors

Any error conditions encountered by the logger will be reported via the SMAR Event Server and optionally to the Windows NT Event Log.

To allow the logger to send messages to the NT Event Log, open the License Monitor by selecting Start > Programs > **SMAR PROCESSVIEW > License Monitor.** In the License Monitor, select the Events tab, as shown in the figure below. Check **AWXLog** in the list of applications.



NT Event Log Configuration

The possible error messages are listed in the table below.

SEVERITY	SOURCE	MESSAGE
500	AWXLog	SMAR AlarmWorX Logger Started.
500	AWXLog	SMAR AlarmWorX Logger Stopped.
500	AWXLog	Primary Printer "%1" now in service. Printing on Backup Printer "%2" terminated
500	AWXLog	Printing has resumed
500	AWXLog	Configuration "%1" INSERT INTO table "%2" succeeded.
750	AWXLog	Failed to Open Primary Printer "%1"
750	AWXLog	Configuration "%1" printer event queue overflow. Messages have been lost. Queue size is %2 events.
750	AWXLog	Primary Printer "%1" has failed. Now Printing on Backup Printer "%2"
750	AWXLog	Configuration "%1" filter is inactive due to syntax error(s).
750	AWXLog	Configuration "%1" logging event queue overflow. Messages have been lost. Queue size is %2 events.

SEVERITY	SOURCE	MESSAGE
800	AWXLog	Error opening Configuration Database: Provider: %1 Connection: %2 (Error string from database is in "Comment" Attribute)
800	AWXLog	Error Querying Configuration Database: Provider: %1 Connection: %2 Query: %3 (COM error string is in "Comment" Attribute)
800	AWXLog	Configuration Database has no configuration for "Node" and no "Default". Provider: %1 Connection: %2
800	AWXLog	Error opening Logging Database for Configuration "%1" Provider: %2 Connection: %3 (COM error string is in "Comment" Attribute)
800	AWXLog	Query of Column definitions failed for configuration "%1" Query: %2 (COM error string is in "Comment" Attribute)
800	AWXLog	Error opening Configuration Database: Provider: %1 Connection: %2 (COM error string is in "Comment" Attribute)
800	AWXLog	Configuration Database has no configuration "%1". Provider: %2 Connection: %3 (COM error string is in "Comment" Attribute)
800	AWXLog	Configuration "%1" subscription to OPC Event Server(s) failed.
800	AWXLog	Configuration "%1" error assigning value to column "%2"
800	AWXLog	Configuration "%1" INSERT INTO table "%2" failed (Error string from database is in "Comment" Attribute)
800	AWXLog	Failed to register "%1" with GenRegistrar. Configuration "%2" will not execute.
800	AWXLog	Printing to both Primary Printer "%1" and Backup Printer "%2" has failed

Using a technology that has been incorporated into all Smar products, TraceWorX provides online diagnostics and tuning of applications running in the ProcessView system. TraceWorX is designed expressly for systems integrators, OEMs and customers who want to have tools for doing their own troubleshooting and diagnostics.

TraceWorX tracks the runtime activity for each ProcessView application and logs the runtime data to a log file based on user-configured trace levels. The log file provides a thorough, color-coded report detailing all activity for the application, including the time, the date, the severity level, and a description of the event or problem.

TraceWorX also features several options for reporting issues to technical support. If you are experiencing problems with any applications, the log file deployment options, such as compressing and e-mailing log files, are ideal for tracking and archiving data and sending detailed reports to technical support. Developers can use these reports to identify the source of the problems.

For information about TraceWorX, please see the TraceWorX Help documentation.

Logger OLE Automation Reference

Introduction

This reference describes the OLE Automation features available in the AlarmWorX Logger.

Automation Interfaces

The AlarmWorX logger provides a COM interface that allows external programs to manipulate the logger as it is running. The interface is available to all programming languages that support COM including Visual Basic (VB), Visual Basic for Applications (VBA) and Microsoft Visual C++.

To access the Automation interface from VB and VBA, AlarmWorX logger must be made available by choosing **Project - References** from the main menu in the VB or VBA development environment and selecting **AWXLog 1.0 Type Library** in the list of available references.

Available Control Properties

boolean LoggingEnabled

Description

True if logging to database is enabled. Applies to all running configurations that match the current **Filter Property**. Property is read/write.

Remarks

Values written to this property are transient. The value written is not stored in the configuration database and hence is "lost" when the logger is shut down.

Reading this property will throw an error in the following cases:

The logger has just started and the configuration has not been read yet.

Multiple running configurations match the filter and they have differing values (some True, some False).

Example

This example shows how to determine if logging is enabled.

```
Dim bEnabled as Boolean
bEnabled = AWXLogger.LoggingEnabled
```

This example shows how to turn on/off logging

```
AWXLogger.LoggingEnabled = True
```

boolean PrintingEnabled

Description

True if logging to printer is enabled. Apply to all running configurations that match the current **Filter Property**. Property is read/write.

Remarks

Values written to this property are transient. The value written is not stored in the configuration database and hence is "lost" when the logger is shut down.

Reading this property will throw an error in the following cases:

The logger has just started and the configuration has not been read yet.

Multiple running configurations match the filter and they have differing values (some True, some False).

Example

This example shows how to determine if printing is enabled.

```
Dim bEnabled as Boolean
bEnabled = AWXLogger.PrintingEnabled
```

This example shows how to turn on/off printing.

```
AWXLogger.PrintingEnabled = True
```

long Count

Description

Return the number of running configurations whose names match the current Filter Property. Property is read-only.

Remarks

Reading this property will throw an error if the logger has just started and the configuration has not been read yet.

Example

```
Dim n as Long
n = AWXLogger.Count
```

string Filter

Description

Wildcard string that a running configuration name must match in order to be affected by other methods and properties of this object. String property is read/write.

Remarks

If the name of a running configuration does ***not*** match the filter, then that configuration is ignored by all other methods and properties of this object. The default initial value for this Property is "*" meaning all running configurations will match, hence by default, all of the methods and properties will operate simultaneously on all running configurations.

Example

```
Dim sFilter as String
sFilter = AWXLogger.Filter

'set filter for all configurations that begin with b
AWXLogger.Filter = "b*"
```

string Item

Description

The name of a running configuration (that matches the **Filter Property**) for a given index value in the array (VB Collection). String property is read-only.

Syntax

Item(long n)

Where **n** is an integer from 1 to **Count**

Remarks

The AlarmWorX logger Automation object is designed as a VB Collection. Each element in the collection is the name of an active configuration that matches the current **Filter Property**.

Example

These three examples do the same thing -- print the name of each configuration.

```
Dim AWXLogger As AWXLogAuto
Set AWXLogger = New AWXLogAuto

' method 1
For Each ConfigName In AWXLogger
   Print ConfigName
Next ConfigName

' method 2
For i = 1 To AWXLogger.Count
   Print AWXLogger(i)
Next i

' method 3
```

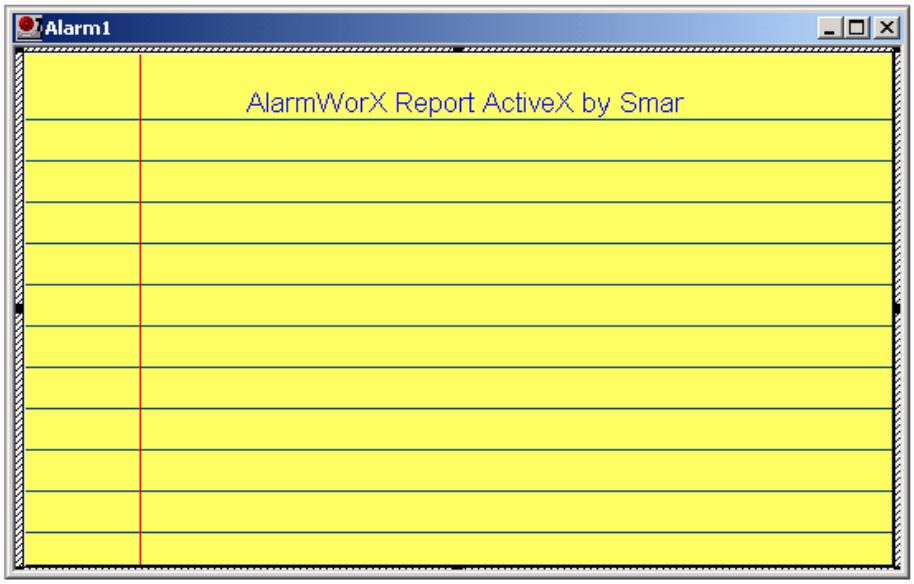
```
For i = 1 To AWXLogger.Count
   Print AWXLogger.Item(i)
Next i
```

Chapter 4

AlarmWorX Report

The AlarmWorX Report ActiveX allows reporting (user-configured or pre-configured) and graphing of alarms. The source of the Alarm data is alarms previously logged by the Alarm Logger. The Alarm Report is an ActiveX, allowing it to be placed in any ActiveX container application, including GraphWorX, Visual Basic, or a Web page.

The AlarmWorX Report ActiveX is accessible from the ActiveX toolbar in the AlarmWorX Container, or from the Edit menu. Selecting Insert New Object from the Edit menu opens the Insert Object dialog box. Select the Smar AlarmWorX Report ActiveX item, and then click OK. The Report ActiveX is inserted into the display, as shown in the figure below.



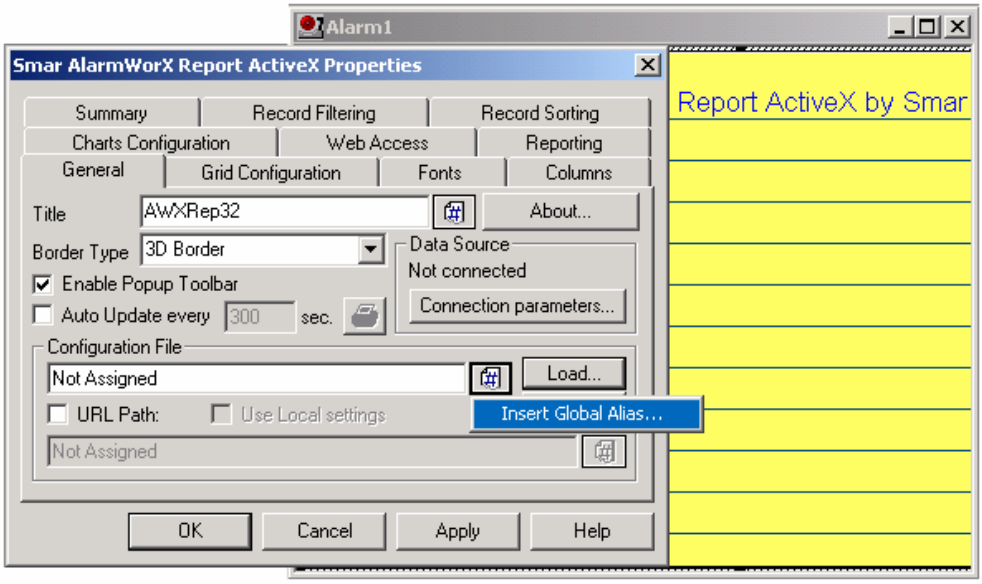
Alarm Container Window With the AlarmWorX Report ActiveX

Configuration

To start the configuration of the Report ActiveX, double-click the ActiveX (the yellow notebook type object). This opens the **Alarm Report ActiveX Properties** dialog box for the ActiveX. Use these property pages to configure how alarms will be reported (appearance, organization, etc.) and which report type will be used.

General

The **General** tab of the **Alarm Report ActiveX Properties** dialog box, shown below, allows you to specify the name of the report file, select the border type and connect to a data source.



Report ActiveX General Tab

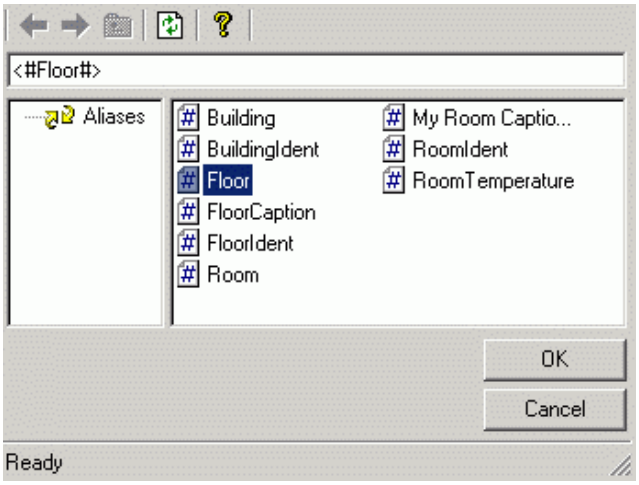
Configure the following **General** tab settings:

- **Title:** Enter a title for the report.
- **About:** Clicking the **About** button displays both technical support information and the SMAR About Box, which contains registration and serial number information as well as system resource information, such as memory and disk space available.
- **Border Type:** Select one of the following border types for the report from the drop-down list: None, Flat, or 3-dimensional.
- **Enable Popup Toolbar:** When this option is checked, the Report toolbar is available during runtime mode.
- **Auto Update:** Specifies the frequency (in seconds) at which the alarm report updates data from the Alarm Logger database.
- **Configuration File:** By default, information is stored as part of the container application's document file. You can also store information as part of a separate (.awr) file. To save the .awr file, click **Save As** to open the **Save AWXReport Configuration Info** dialog box. Enter a name for the .awr file in the **File Name** field, and then click **Save.**

You can also open an existing configuration file by clicking the **Load** button on the **General** tab and browsing for the file. If Configuration File is selected, the Report ActiveX will attempt to load from the file listed under **File name.** If **URL Path** is checked, the ActiveX will use the specified network URL path upon loading the file.

Note: The ActiveX cannot be saved to a URL path. To create a URL file, save a report configuration to a local file and copy the file to the desired network location.

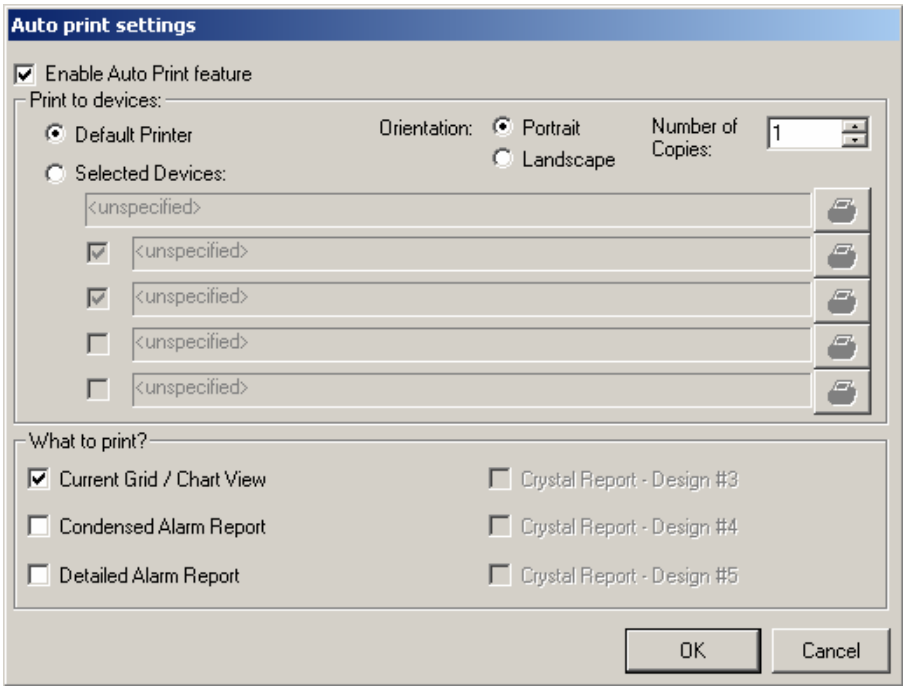
You can also select aliases to use for the configuration file. Clicking the **...** button and selecting **Insert Global Alias** from the pop-up menu opens the Global Alias Browser, as shown in the figure below. Select a global alias from the Global Alias Browser, which includes all global aliases in the global alias database. This eliminates the need to manually type in the alias name. All global aliases that are configured in the Global Alias Engine Configurator are conveniently available to choose from inside the browser. The tree control of the Global Alias Engine Configurator is mimicked in the tree control of the Global Alias Browser. Select a global alias by double-clicking the alias name (e.g. "Floor" in the figure below). The alias name appears at the top of the browser, which automatically adds the <# and #> delimiters to the alias name. Click the **OK** button.



Selecting an Alias From the Global Alias Browser

- **Data Source:** Clicking the **Connection parameters** button opens the **Database Connection** dialog box, where you can specify an alarm logger database. See "Connecting to a Data Source" below.
- **Auto Print:** The Auto Print feature is available only when the **Auto Update** feature is enabled. Reports are printed automatically on the same time interval specified for the auto update. Thus, if the Auto Update is set for 300 seconds, then reports will be automatically printed every 300 seconds.
- Clicking the printer button opens **the Auto Print Settings** dialog box, as shown in the figure below. Check the Enable Auto Print feature check box. If you use the **Default Printer** for your system, you can specify the page orientation and number of copies. If you choose an alternate device under **Selected Devices,** you must click on the printer buttons to the right to configure the settings for each device.
- The options available under **What to Print?** depend on your database connection and whether you have configured any Crystal Report Designs in the **Reporting** tab of the **Alarm Report ActiveX Properties** dialog box.

Note: If the Crystal Report Engine is not installed on the local machine, then auto print for Crystal Reports will not work on that machine.



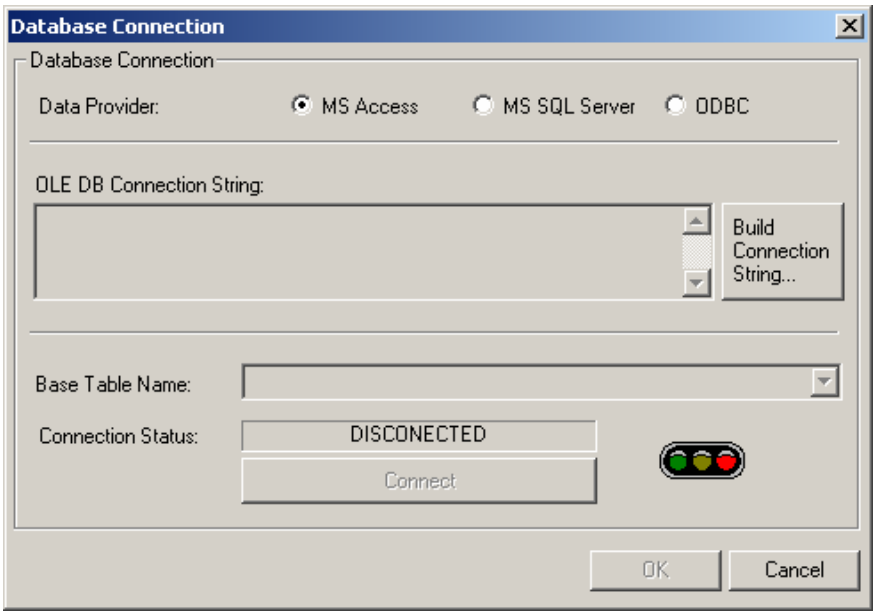
Configuring Auto Print Settings

Connecting to a Data Source

To connect to a data source:

1. Click the **Connection parameters** button. This opens the **Database Connection** dialog box, as shown below.

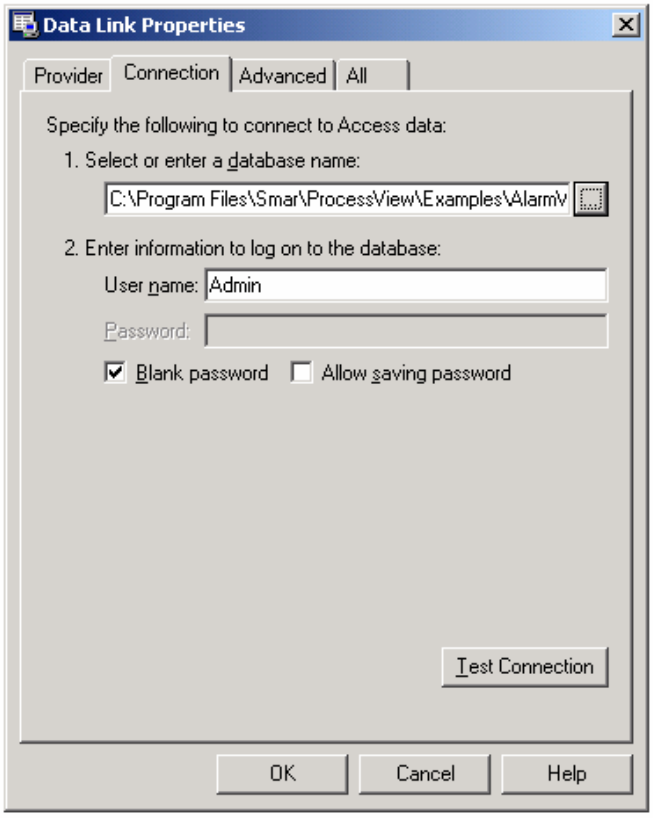
2. Under **Data provider,** select from Microsoft Access, Microsoft SQL Server, or ODBC (Open Data Base Connectivity), as shown in the figure below.



Connecting to a Database

3. Click the **Build Connection String** button. This opens the Microsoft **Data Link Properties** dialog box, as shown in the figure below. In the **Connection** tab specify the data source and then click **OK.**

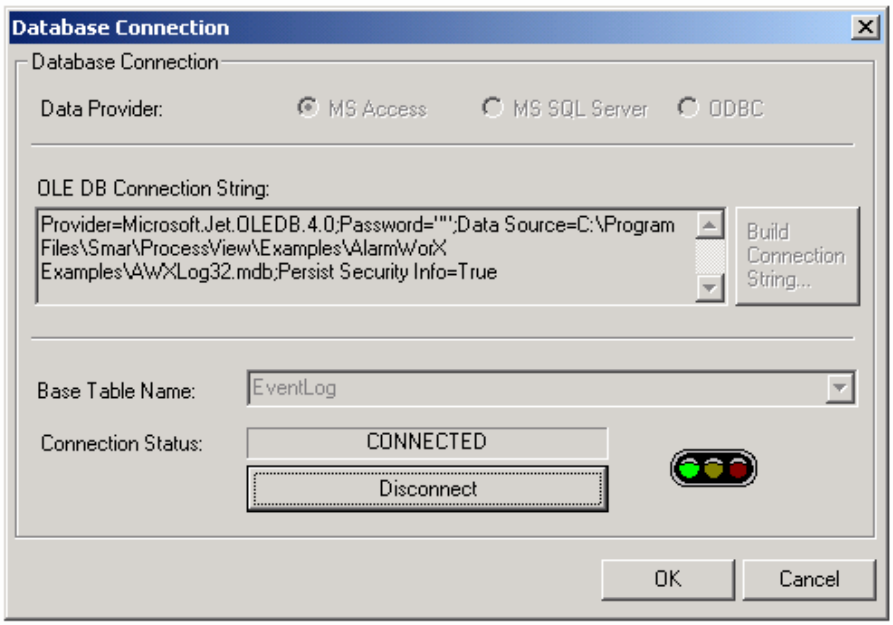
Note: All data source connections are made through the **Data Link Properties** dialog box. The **Connection** tab settings may vary depending on which data provider you selected. Click the **OK** button. Click the **Help** button at any time to view the Microsoft Data Link help documentation.



Specifying a Data Source

4. The data source reference appears in the **Database Connection** dialog box in the **OLE DB Connection String** field, as shown below. The **Base Table Name** field lists the tables in the database. You can select a specific table from the drop-down list to use as the reference table for the database.

5. Click the **Connect** button to connect to the database. The traffic light icon changes to green when the connection is successful, as shown in the figure below.

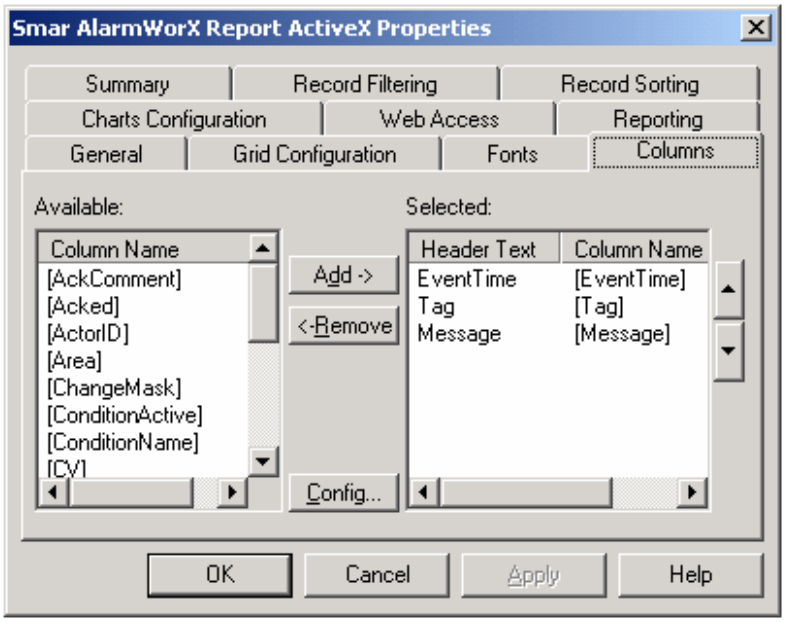


Database Connection

Columns

In the **Columns** tab of the **Alarm Report ActiveX Properties** dialog box, shown below, you can specify which columns will appear in your alarm report. By default, the following three items are included in the report: EventTime, Tag, and Message, as shown in the **Selected** list in the figure below.

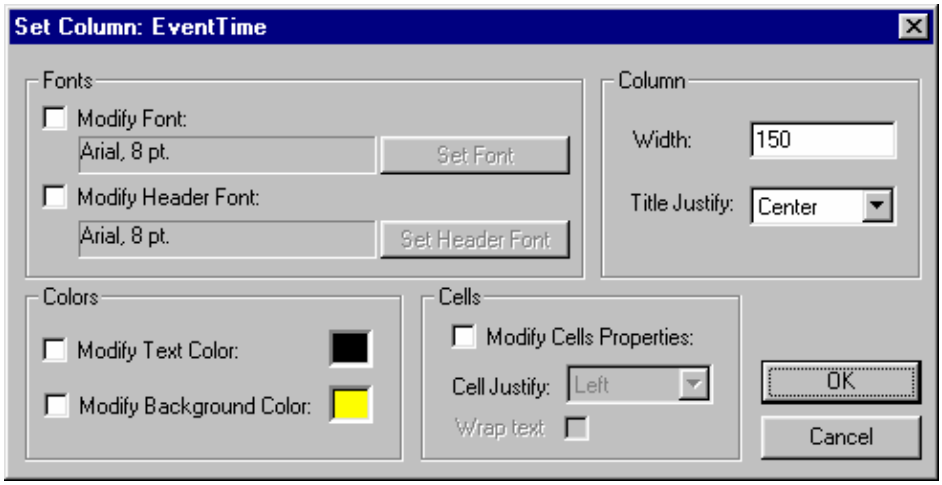
Note: For more information about column types, event types and attributes, please see the AlarmWorX Viewer, AlarmWorX Server, and AlarmWorX Logger documentation.



Report ActiveX Columns Tab

By clicking the **Add** and **Remove** buttons in the middle of and the "up" and "down" arrows on the right side of this the Columns tab, you can select which columns to include in the report as well as indicate the order of their appearance. To move an item from the **Available** list to the **Selected** list, simply highlight the item and click the **Add** button. To move an item back from the **Selected** list to the **Available** list, highlight the item and click the **Remove** button. To change the order of an item in the **Selected** list, simply select the item and click the "up" and "down" arrows located on the right-hand side.

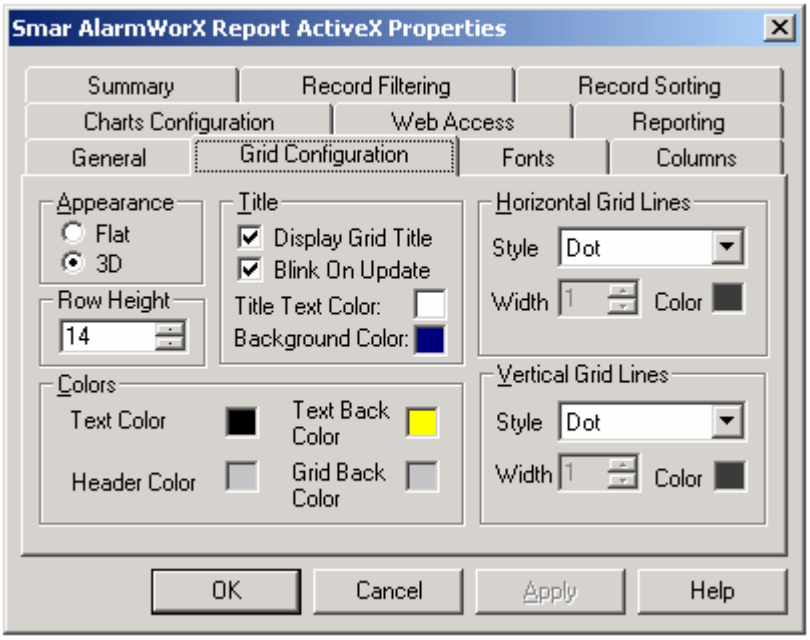
You can also change the appearance of a column by either double-clicking on an item in the **Selected** list or selecting the item and clicking the **Config…** button. The **Set Column** configuration dialog for the item opens, as shown below. From this dialog, you can set the font, color, width, and cell properties by selecting and changing the various options available.



Columns Configuration Dialog

Grid Configuration

The **Grid Configuration** tab of the **Alarm Report ActiveX Properties** dialog box, shown below, determines how the grids on your alarm report will look and act.



Report ActiveX Grid Configuration Tab

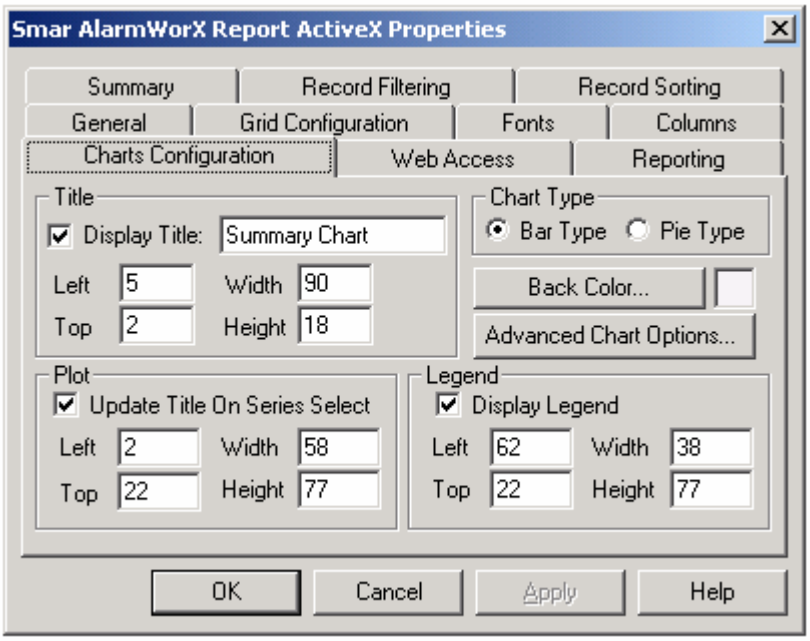
Configure the following grid settings:

- **Appearance:** Choose either a 3-dimensional grid or a flat grid.
- **Row Height:** Specifies the space between horizontal grid lines.
- **Colors:** Specifies colors for the grid text, headers, and background.
- **Title:** To show the grid title on the report, check the Display Grid Title check box. When **Blink on Update** is checked, the grid title will blink each time the report is updated with new data from the Alarm Logger database. You can also specify the color for both the title text and background.
- **Grid Lines:** Both **Horizontal** and **Vertical** grid lines appear on the alarm report. You can specify the **Width, Style** (e.g. Solid, Dashed, etc.), and **Color** of the grid lines. To change the color of the grid lines, simply click the **Color** check box and select a color from the color palette.

Note: It is not necessary to have grid lines, but it is helpful in distinguishing between different records.

Charts Configuration

The **Charts Configuration** tab of the **Alarm Report ActiveX Properties** dialog box, shown below, refers to the chart that will be generated from the report data. The settings in the **Charts Configuration** tab determine how the chart will appear in runtime mode. To access the report chart, enter runtime and click the **Chart Summary** button. For more details on this runtime feature, please see the **Runtime - Chart Summary** section.



Report ActiveX Charts Configuration Tab

Configure the following chart settings:

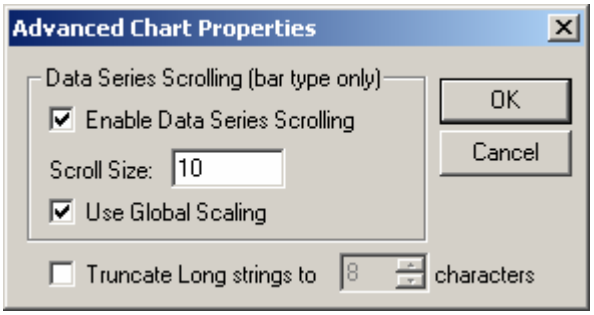
- **Chart Type:** Select one of two types of chart: **Bar** or **Pie.**
- **Background Color:** Set the background color for the chart (the color that will surround the chart) and the chart's title.
- **Title/Plot/Legend:** You can toggle the visibility of chart title and/or legend by checking or unchecking **Display Title** or **Display Legend,** respectively.

You can also set the exact positions and sizes of chart elements (title, plot, and legend). The positions are determined by values in the **Left** and **Top** fields, and sizes for particular chart elements are set in the **Height** and **Width** fields. The positions and sizes are given in the percentage of full width and height of chart area, assuming that the coordinate origin (0,0) is located in the top left corner of the chart. For example, setting Left=50, Top=50, Height=50, Width=50 for the chart legend will position legend in the lower right quadrant of the chart area.

If **Update Title On Series Select** is checked, the chart's title text will be updated when you click on any data series (either bar or pie segment) of the plot object. A name of the selected data series will be included with the title text. This mode is particularly useful when the chart legend is hidden.

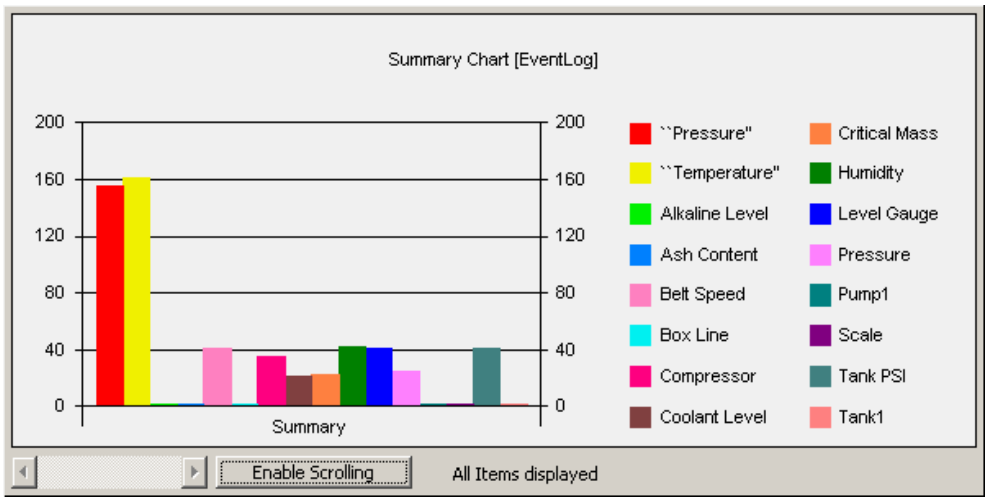
- **Advanced Chart Options:** Clicking the **Advanced Chart Options** button opens the **Advanced Chart Properties** dialog box, as shown in the figure below. If your alarm records contain long strings of data, you can abbreviate the strings by checking **Truncate Long strings to "X" characters.** Then specify the maximum number of string characters to be displayed (in place of the "X").

For bar charts, checking **Enable Data Series Scrolling** allows you to scroll across the bars in the chart. The number of bars in the scrolling region is determined by the **Scroll Size.** When scrolling is enabled for bar charts, you have the option of using global scaling.



Advanced Chart Properties

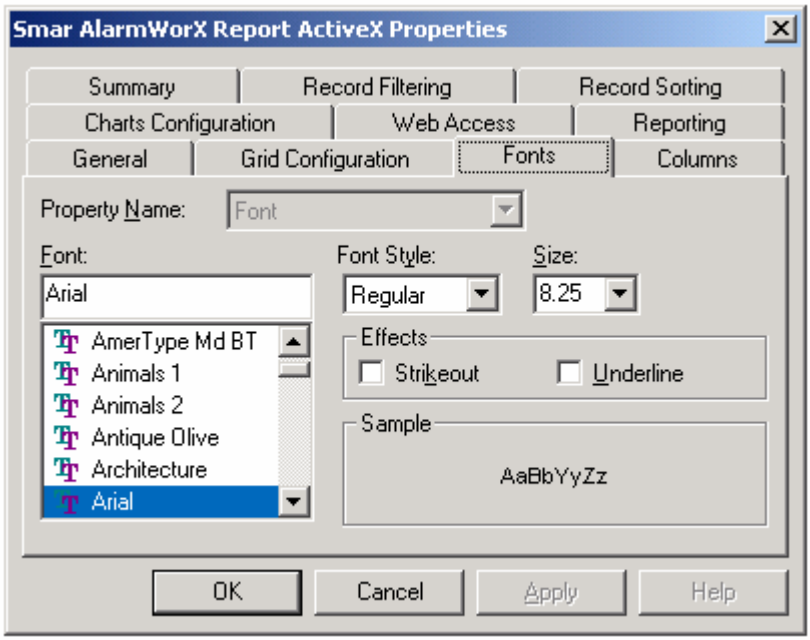
If scrolling is enabled, an Enable Scrolling button appears at the base of the bar chart summary in runtime mode, as shown below. Click this button to scroll left or right between bars on the chart using the arrows.



Bar Chart Summary

Fonts

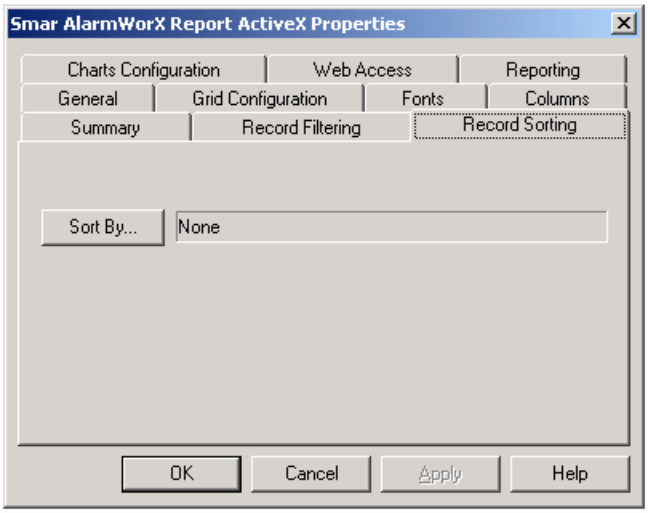
The **Fonts** tab of the **Alarm Report ActiveX Properties** dialog box, shown below, specifies the font size, style, and text effects (i.e. underline and strikethrough) for the alarm report.



Report ActiveX Fonts Tab

Records Sorting

The **Records Sorting** tab of the **Alarm Report ActiveX Properties** dialog box, shown below, has just one button: the **Sort By** button.



Report ActiveX Records Sorting Tab

Clicking the **Sort By** button opens the **Sorting Fields** dialog box, as shown in the figure below. You can choose whether to disable or enable sorting by leaving the **Disable All Sorting** check box checked or unchecked. If you choose to leave this box unchecked, then several sorting options are available. Here you will specify the priority by which the fields in the alarm report are sorted.

Sorting Fields Dialog Box

To change the priority by which the fields will be displayed, highlight a field and then click the **Move Up/Move Down** buttons. The order of the columns under **Field** indicates their priority level.

To determine the order in which the data will be displayed within in each column, highlight that column and select one of the following sorting options:

- **Do Not Sort on This Field:** Leaves the data unsorted.
- **Sort Ascending:** Sorts the data in the column in ascending order (i.e. from least to greatest)
- **Sort Descending:** Sorts the data in the column in ascending order (i.e. from greatest to least)

All elements will be sorted by the first category in the list. In the event that two elements in the first category are identical, the reported alarms are sorted by the criteria configured for the next item in the list.

If you are dealing with language translations, you have the option of resorting values after translating them. This option is for advanced users and is not recommended for scenarios where there is a large set of records after filtering.

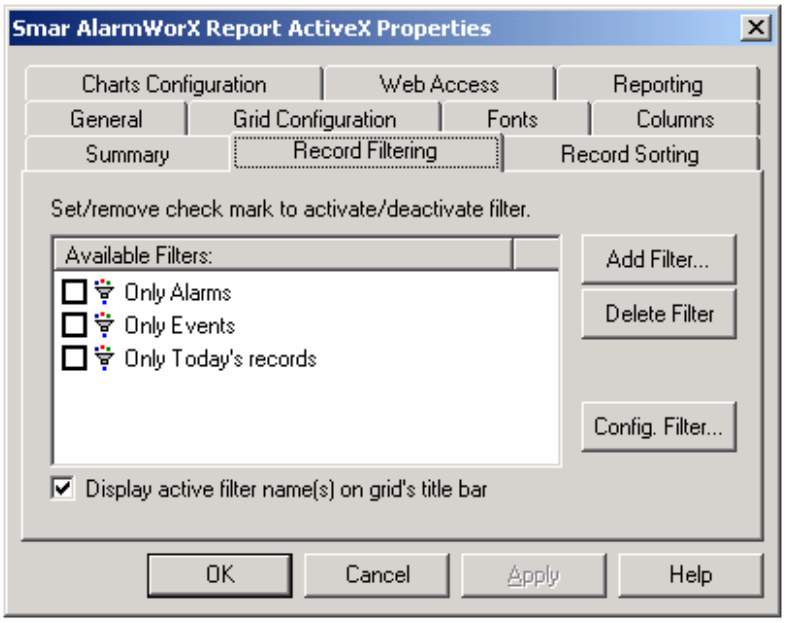
You can also set the **Summary Field Sort Order** (see **Runtime - Data Grid** and **Chart Summary** for more information on the summary field) by selecting **Descending** or **Ascending.**

If the **Enable sorting action on grid header double-click** check box is selected, then you have the option of double-clicking the header of each column in the report while in runtime to toggle between ascending and descending sorting for the selected column.

Note: You can also access the **Sorting Options** dialog box via the **Sort Alarms** button on the **AWXRep** toolbar while in runtime mode. (Double-click anywhere in the ActiveX client box to show the **AWXRep** toolbar.)

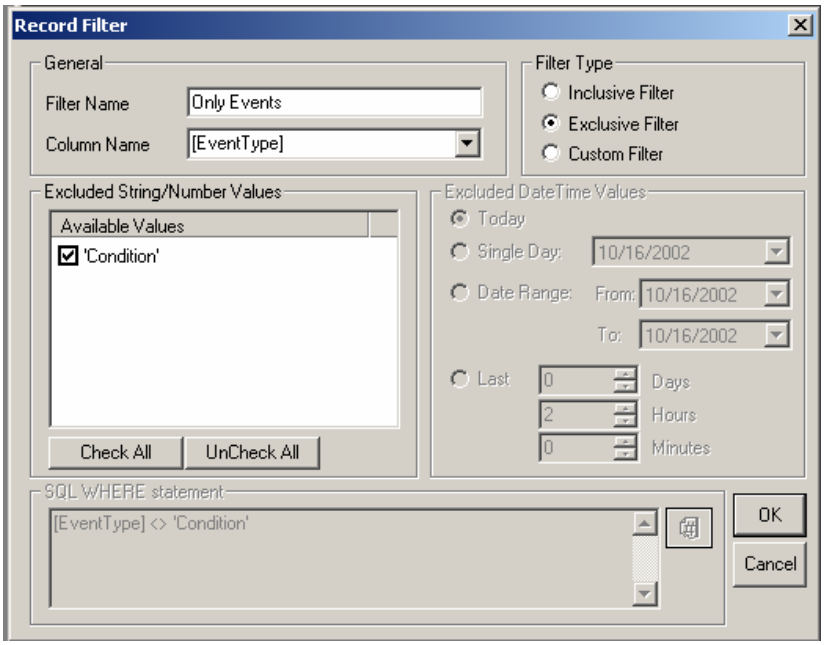
Record Filtering

The **Records Filtering** tab of the **Alarm Report ActiveX Properties** dialog box, shown below, offers simple filtering options for the alarm report. You can filter by date, by tag, or by custom SQL statements.



Reports ActiveX Record Filtering Tab

All of the items checked in the **Available Filters** list box are used as criteria for determining which alarms/events are displayed on the grid in runtime. If the **Display active filter name(s) on grid's title bar** check box is selected, then the names of the filters that are checked will appear on the grid's title bar while in runtime. To configure a filter, either click the **Add Filter…** button to set a new filer or select an existing filter and click the **Config Filter…** button to modify the filter. Either action opens the **Record Filter** dialog box, shown below.



Record Filter Dialog

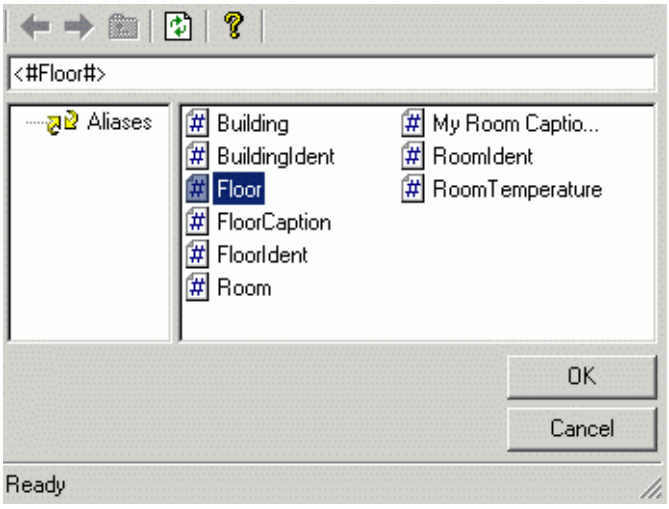
The decision of whether to use string/number values or date/time ranges for filtering depends on the column selected in the **Column Name** drop-down list. If **[EventTime]** is selected from this list, then a date/time range specified in the **Included Date/Time Values** field is used for the filtering criteria. For any other **Column Name** selection, the string/number values that are checked in the **Available Values** list box are used for the filtering criteria. You will notice, as you select different values for **Column Name** that the list of available values in the list box changes.

Three types of filtering are available:

Inclusive Filter: If an inclusive filter is used, then the alarm conditions that meet the criteria set by the items selected in the **Available Values** list box or the alarms appearing within the time range specified in **the Included Date/Time Values** field pass through the filter and are displayed in the alarm report grid in runtime.

Exclusive Filter: If an exclusive filter is used, then the matching alarms do not pass through the filter and are not displayed in runtime.

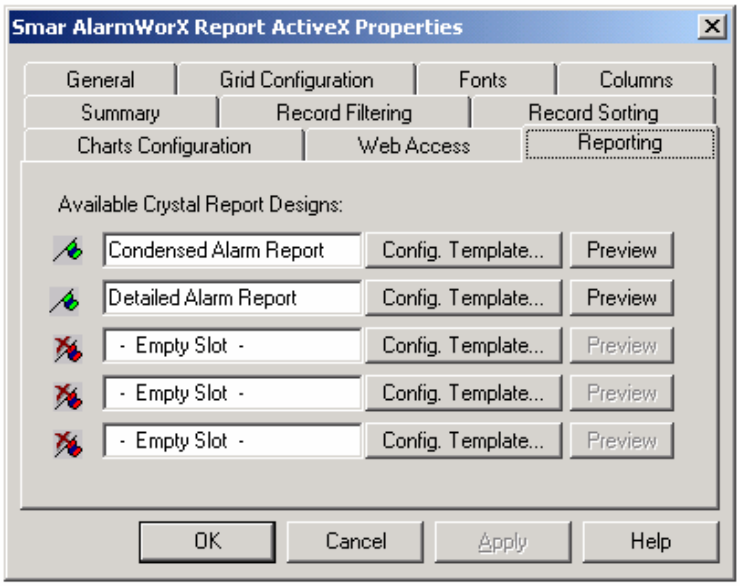
Custom Filter: If custom filtering is used, then you have the option of typing a **SQL WHERE statement** in the text box at the bottom of the dialog box to specify what type of values can pass through the filter. You can also select a global alias to use in the SQL WHERE statement. Clicking the # button opens the **Global Alias Browser,** shown below, which allows you to choose from a list of aliases in the Global Aliasing System Engine.



Selecting Global Aliases From the Browser

Reporting

The Report ActiveX Control makes use of Seagate Crystal Reports (version 8.0) for versatile, neat, and easy-to-manage alarm reports. From the **Reporting** tab of the **Alarm Report ActiveX Properties** dialog box, shown below, you can configure templates for Crystal Reports. Clicking the **Preview** button next to any configured template launches Crystal Reports and displays a sample report matching the criteria set in the template configuration.



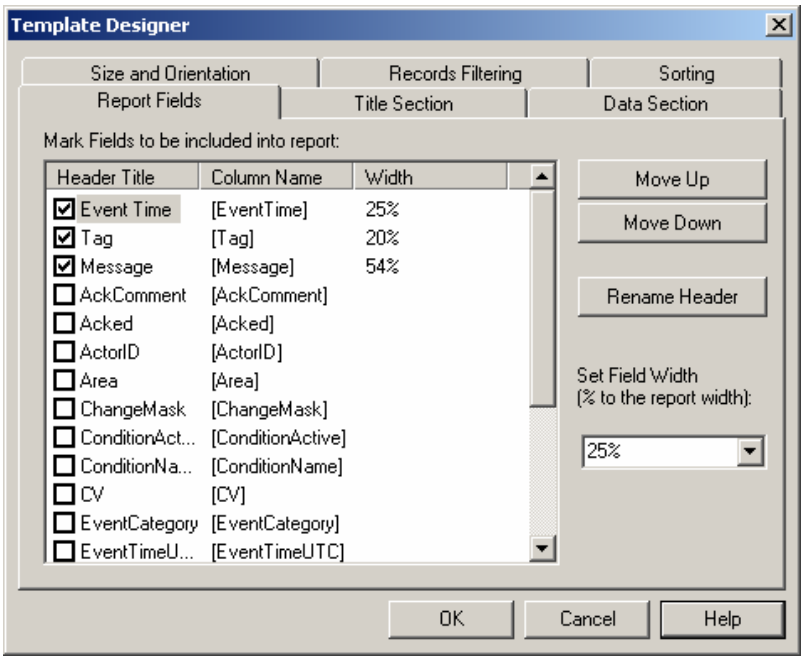
Alarm Report ActiveX Reporting Tab

Clicking on any of the **Config. Template…** buttons opens the **Template Designer** dialog box, which contains the following tabs:

- **Report Fields**
- **Title Section**
- **Data Section**
- **Size and Orientation**
- **Records Filtering**
- **Sorting**

Report Fields

As the **Template Designer** dialog box opens, it defaults to the **Report Fields** tab, shown below. Here you can configure which alarm columns to report, the order in which they are to be reported, and the amount of space each category will take on the report.

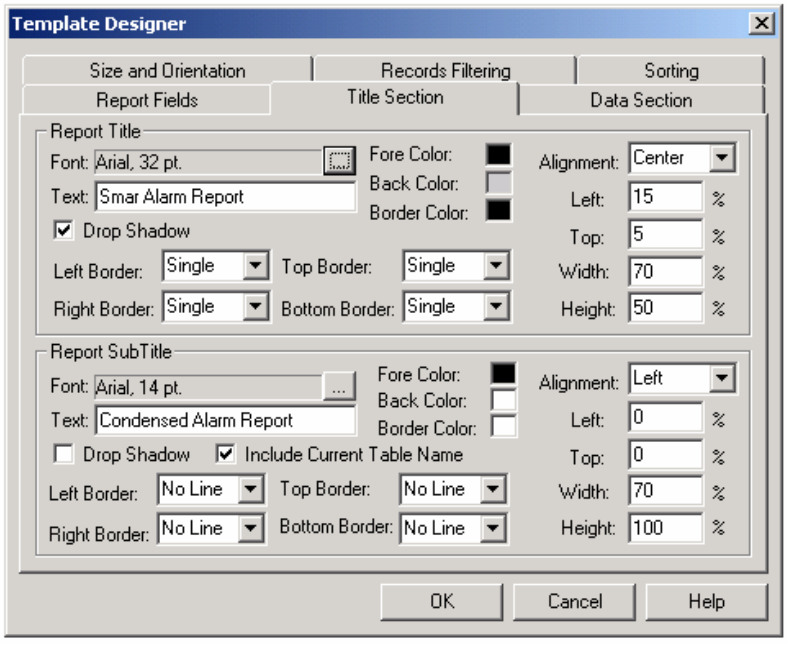


Report Fields Tab of Template Designer Dialog Box

To select columns to be reported, simply check the appropriate items in the list box. To change the order of an item, highlight the item and click the **Move Up** and **Move Down** buttons. You will see the item move up and down the list as you do so. When you select an item, you can also specify a width as a percentage of the width of the entire report. You can rename the header title by clicking the **Rename Header** button and filling in the appropriate text, or you can simply click on the header text itself and wait for the cursor to appear.

Title Section

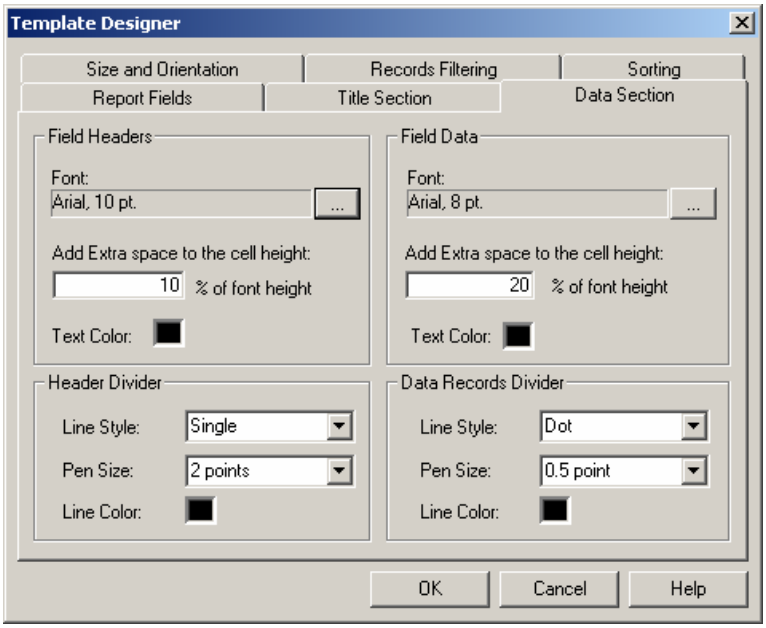
The **Title Section** tab of the **Template Designer** dialog box, shown below, allows you to configure a title for your report. Simply adjust the text, colors, borders, font, shadowing, and alignment of your title and subtitle to match the desired appearance.



Title Section Tab of Template Designer Dialog

Data Section

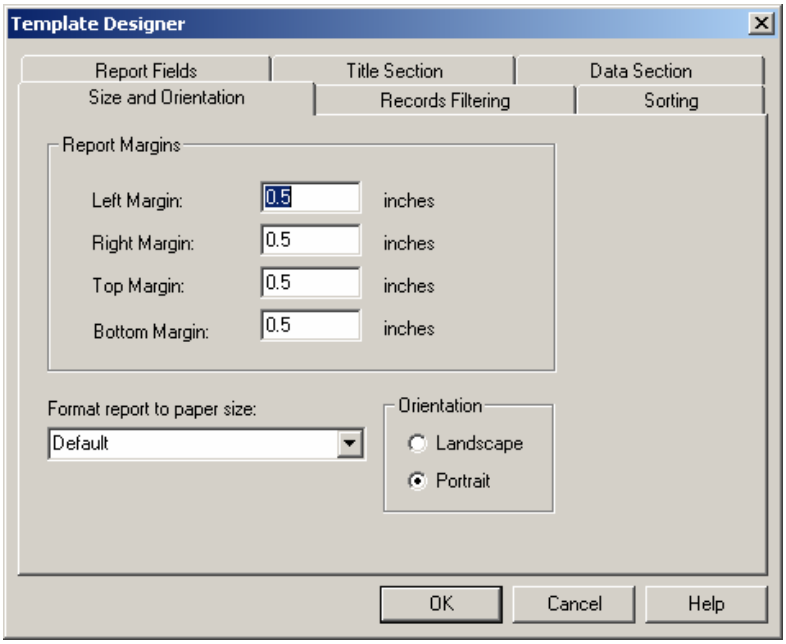
The **Data Section** tab of the **Template Designer** dialog box, shown below, configures the appearance of the headers and fields of your reported data. Adjust the font, cell padding, and text color of the column headers in the **Field Headers** frame. You can change the style, thickness, and color of the header dividers by adjusting the **Line Style, Pen Size** and **Line Color** items in the **Header Divider** frame. To adjust the appearance of the reported data and dividers, make the appropriate modifications to the **Field Data** and **Data Records Divider** frames.



Data Section Tab of Template Designer Dialog Box

Size and Orientation

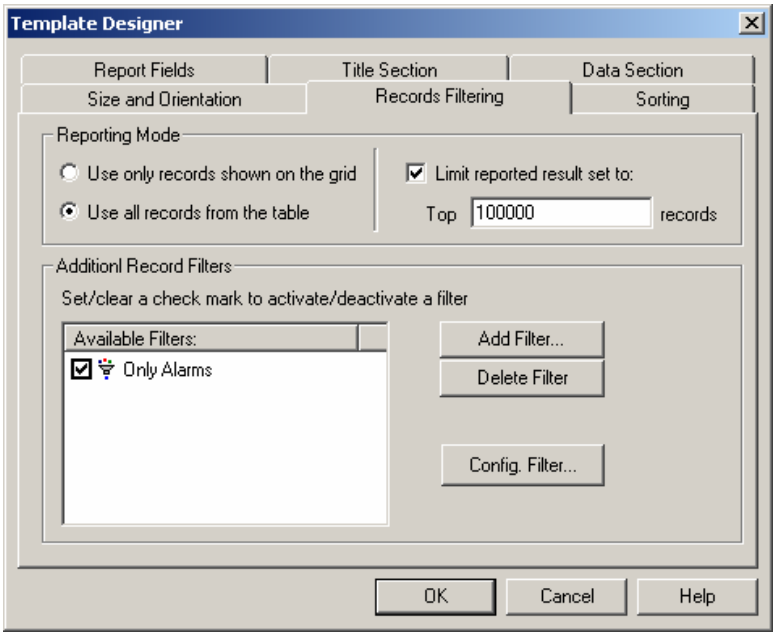
The **Size and Orientation** tab of the **Template Designer** dialog box, shown below, adjusts the margins for the final report. Simply fill in the margin fields as needed. Adjust the paper size by selecting an item from the **Format report to paper size** drop-down list. (The default is 8.5 x 11 inches.) You can also specify a **Portrait** (vertical) or **Landscape** (horizontal) orientation for the report.



Size Tab of Template Designer Dialog Box

Records Filtering

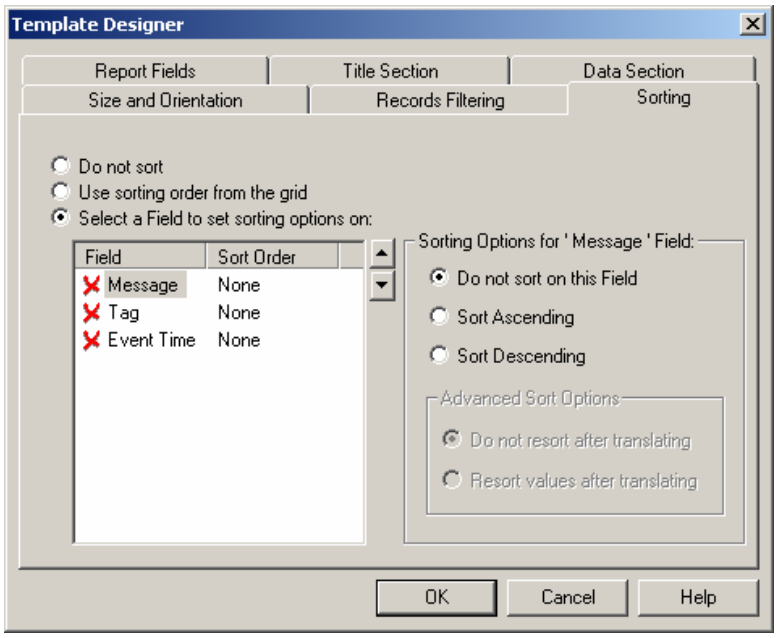
You can configure filters for your reports on the **Records Filtering** tab of the **Template Designer** dialog box, shown below. Records can be reported either from the grid or from the alarm table. One level of filtering marks the difference between reporting alarms from the grid and reporting alarms from the table. The alarms that make it from the table to the grid are the ones that pass through the filter defined in the **Record Filtering** tab of the **Alarm Report ActiveX Properties** dialog box. The records chosen, whether from the alarm table or from the grid, can be filtered for reporting in the **Available Filters** list. (In case you are reporting only records shown on the grid, this is a second level of filtering from the alarm table to the report) The adding, deleting, and configuring of filters is handled the exact same way as on the **Record Filtering** property tab.



Records Filtering Tab of Template Designer Dialog Box

Sorting

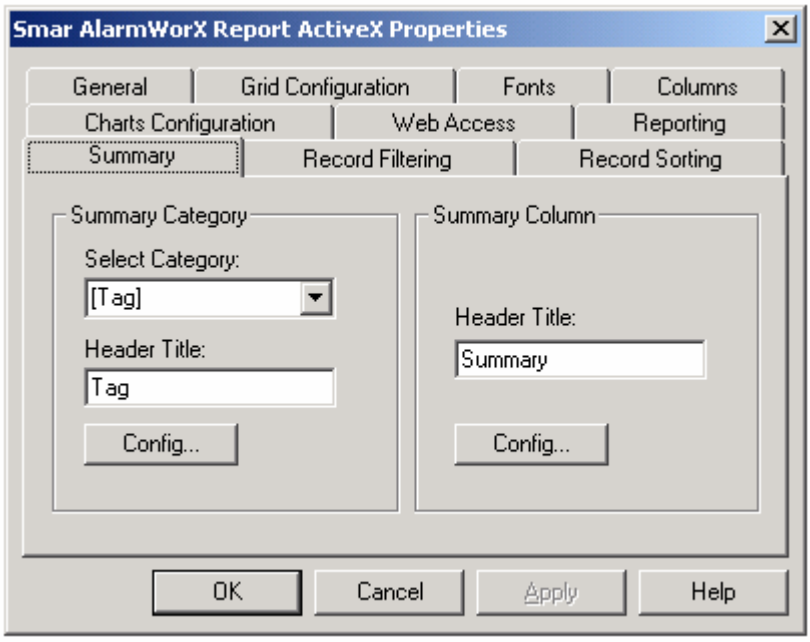
The **Sorting** tab of the **Template Designer** dialog box, shown below, provides three options for sorting alarm records in your report. You can choose not to sort at all by selecting the **Do not sort** option. If the **Use sorting order from the grid** option is selected, then the report sorting defaults to the sorting defined on the **Records Sorting** tab of the **Alarm Report ActiveX Properties** dialog box. You can override the grid sorting by choosing **Select a Field to set sorting options on**. Set your sorting parameters with the list box and options below. For detailed information on configuring your custom sorting, see the **Records Sorting** section.



Sorting Tab of Template Designer Dialog Box

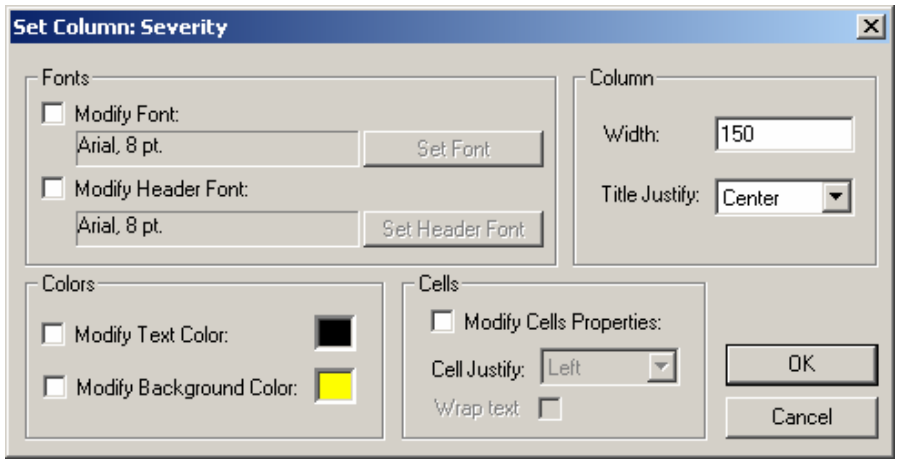
Summary

The **Summary** tab of the **Alarm Report ActiveX Properties** dialog box, shown below, configures the content and appearance of summary information to be displayed on the alarm report grid in runtime mode. The **Select Category** drop-down list specifies the category of alarm to be displayed in the summary.



Alarm Report ActiveX Summary Tab

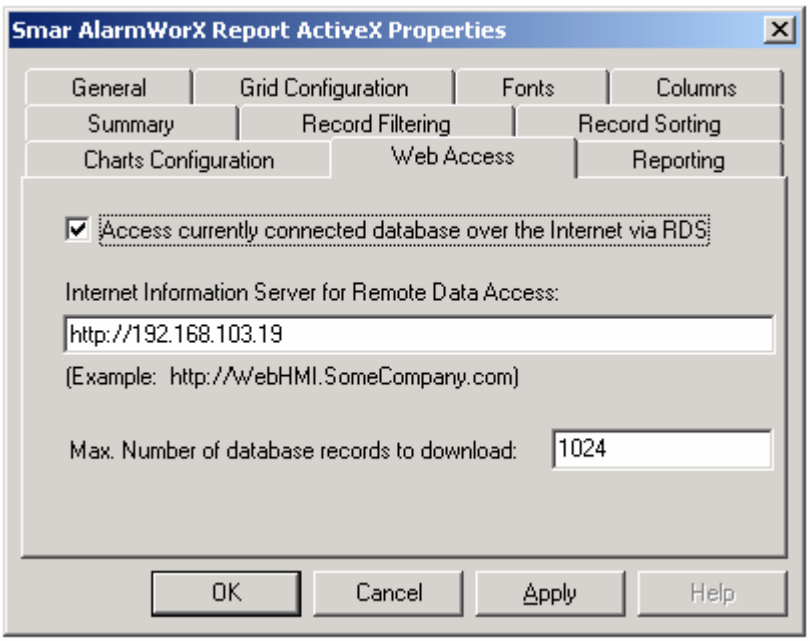
You can also select a title and click the **Config…** button. This opens the **Set Column** dialog box for the selected category, as shown below. Here you can adjust the font, color, and appearance of the selected alarm category. The title and configuration on under **Summary Column** are used to modify the appearance of the values associated with the **Summary Category.**



Setting the Summary Column/Category Characteristics

Web Access

The **Web Access** tab of the **Alarm Report ActiveX Properties** dialog box, shown below, allows you to access the currently connected Alarm Logger database over the Internet via a **Remote Data Service (RDS).** The RDS, which is hosted by an Internet Information Server (IIS), enables the downloading of report data from the logger database to a client over the Internet. Simply specify the URL name or IP address of the IIS Web server in the **Internet Information Server for Remote Data Access** field, as shown in the figure below. You can also specify a maximum number of database records to download from the logger database. The default maximum number of records is 1,024.

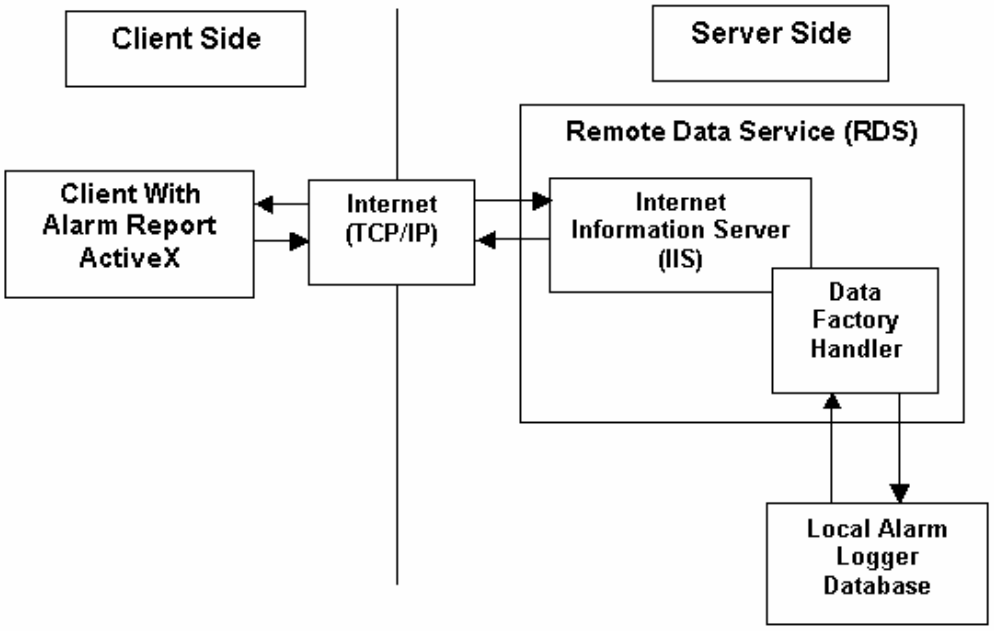


Alarm Report ActiveX Web Access Tab

When Internet Access to the logger database is enabled, the client makes a request over the Internet to the IIS Remote Data Service. The RDS uses a special component, called the Data Factory Handler, to relay the request to the local logger database on the server, as shown in the figure below. The RDS retrieves the relevant information for the alarm report from the logger database so that the client can download the data from the server over the Internet. The client machine then displays the data in the Report ActiveX per the client's report configuration settings.

In most typical scenarios, the Report ActiveX configuration is done on the server side. Those steps include:

- Connection to the database is established by clicking the **Connection Parameters** button on the **General** tab of the **Report ActiveX Properties** dialog and using the **Database Connection** dialog.
- Internet access settings are enabled on the **Web Access** tab.
- Configuration data saved as a *.awr file or a *.gdf display containing the Report ActiveX are published to an HTML document on a WebHMI server.



Downloading Alarm Report Data From a Remote Logger Database

Tips for Remote Data Access

A good understanding of Remote Data Access principles is a key element to building a successful solution for a Web-enabled alarm reporting system. Since the volume of alarm databases can reach hundreds of megabytes, it is very important to keep in mind the following aspects.

Maximum Number of Downloadable Database Records and Adequate Record Filtering

The setting for the maximum number of records to download (Nmax) indicates that any database query operations would return no more than Nmax alarm records (lines to the grid). If more than Nmax records from the current table match the current filtering criteria, then only the portion of the record set containing top Nmax records is returned. To avoid such record set cut-off, strong restrictive record filters should be used all the time. Since the record filters are processed on the database side, the database server uses all existing records to build the record set.

Proper Choice of the Back-end Database

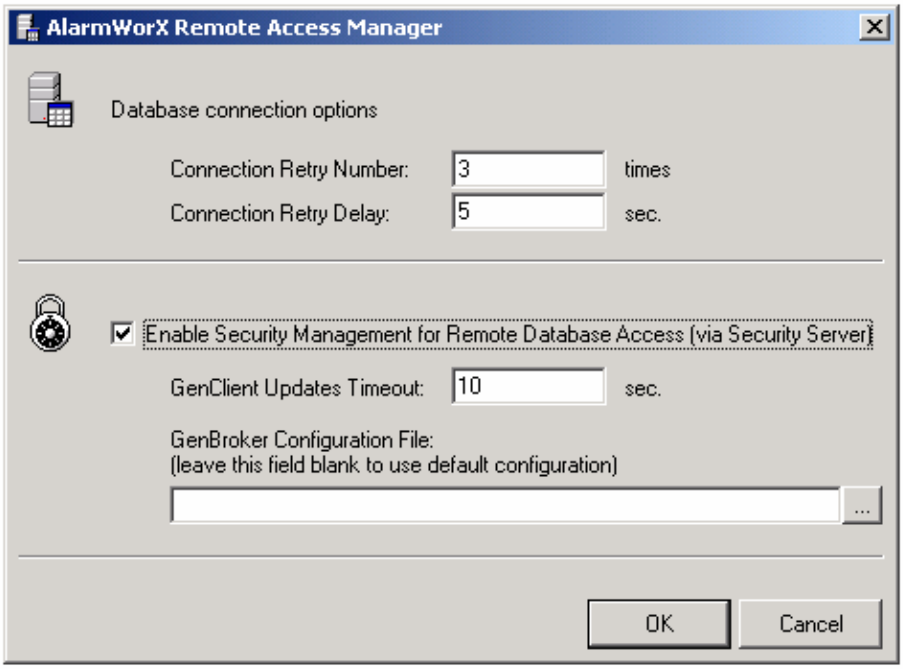
It should be noted that the use of Microsoft Access databases (*.mdb) is not recommended for Web Access. Poor memory management in Microsoft Jet Engine creates a serious scalability problem for any type of Web database application. **The recommended back-end database for Web alarming is MSDE (Microsoft Desktop Engine) or Microsoft SQL Server.**

Table Management in Alarm Logger Configuration

To provide further optimization for the Alarm Logger database operations, the table management should be enabled in the logger configuration. See the Alarm Logger Configurator documentation for more information.

Using the Remote Database Access Manager

The **AlarmWorX Remote Database Access Manager,** shown in the figure below, is a separate utility (the **AWXRepRDSSM.exe** file) located in the ProcessView Bin directory. This utility configures the communication parameters for the Data Factory Handler (described above) so that the AlarmWorX Report ActiveX can connect to a remote Alarm Logger database and retrieve data from the database. It also enables security for remote database access via the ProcessView Security Server.



AlarmWorX Remote Database Access Manager

Database Connection Options

The **Database Connection Options** section of the AlarmWorX Remote Database Access Manager sets the following connection parameters for the Data Factory Handler:

- **Connection Retry Number:** Specifies the maximum number of times the Data Factory Handler will try to reconnect to the Alarm Logger database in case the connection fails.
- **Connection Retry Delay:** Sets the amount of time (in seconds) the Data Factory Handler waits between subsequent connection retries to the Alarm Logger database.

Security Management

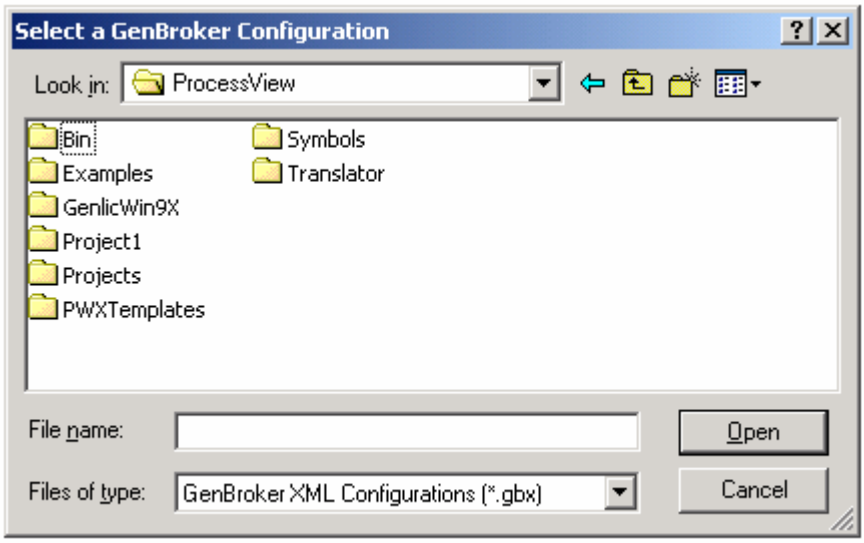
The AlarmWorX Remote Database Access Manager allows you to enable security for remote database access via the ProcessView Security Server. Check the **Enable Security Management for Remote Database Access (via Security Server)** check box. When security is enabled, each time a user tries to access the Alarm Logger Database, the Security Server will check to verify whether that user is allowed to have remote access to the database.

Note: For information about the Security Server configuration and login, please see the Security Configurator and Security Login Help documentation.

Because the database is accessed over the Internet via TCP/IP communications, GenBroker communications over OPC over TCP/IP must also be enabled. Thus, you must specify a **GenBroker Configuration File** (.gbc or .gbx). Clicking the **…** button to the right of this field allows you to browse for a GenBroker configuration file, as shown in the figure below. If you do not specify a GenBroker configuration file, or if no Security Server is specified in the GenBroker configuration, then the default system GenBroker configuration file will be used.

Note: If you are using WebHMI, it is recommended that the Security Server be located on the same machine as the WebHMI Server. For information about how to configure GenBroker communications, please see the GenBroker Help documentation.

The **GenClient Updates Timeout** sets the maximum amount of time (in seconds) the Data Factory Handler will wait for Security Server validation of a data request from the client (i.e. the client with the Alarm Report ActiveX installed) before returning an "Access Denied" error.



Selecting a GenBroker Configuration File

Security

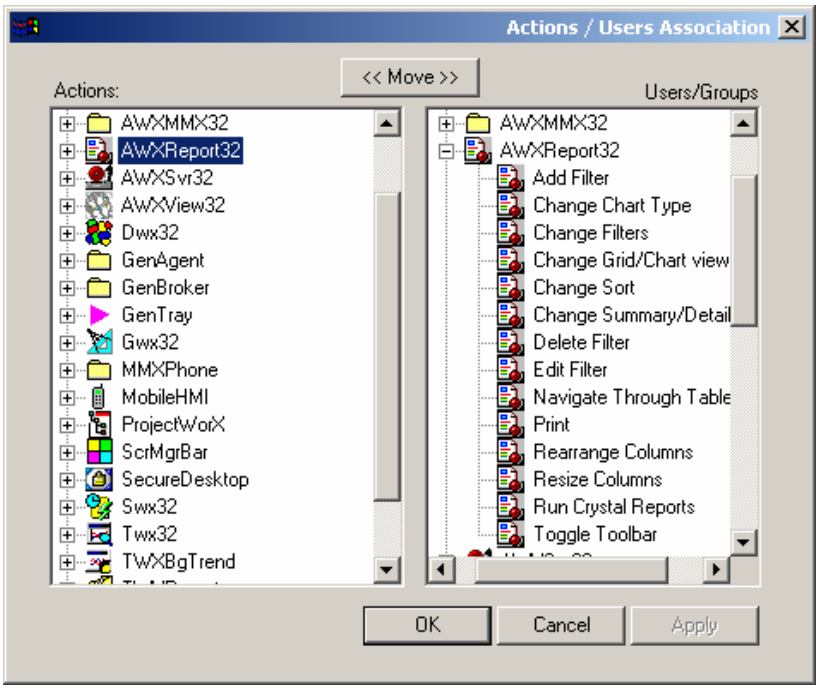
To access the Smar security server, either select **Security > Configuration** from the **Tools** menu, or click the Security button on the toolbar. This opens the Security Server Login dialog box, as shown below.

Security Server Login

Enter your **User Name** and **Password,** and then click **OK.** This opens the Smar Security Server Configurator, where it will be possible to access the Security Server. Depending on your configured level of security, you may or may not be able to edit components of the Security Server.

Note: For more information about security, please see the Security Configurator help documentation.

Once a user has gained access, the Smar Security Server dialog box will appear. From the **Edit** menu, choose **Application Actions.** The **Actions/Users Association** dialog box appears as shown below.



Editing Security Actions and User Associations

The Security Server can be set up to allow access to several different actions from this dialog. To set the options for the AlarmWorX Report ActiveX, select **AWXReport** from the list in the right pane. This brings up the list in the left pane, which includes the following options:

- Add Filter
- Change Chart Type
- Change Filters
- Change Grid/Chart View
- Change Sort
- Change Summary/Details View
- Delete Filter
- Edit Filter
- Navigate Through Tables
- Print
- Rearrange Columns
- Resize Columns
- Run Crystal Reports
- Toggle Toolbar

Global-Aliasing Support

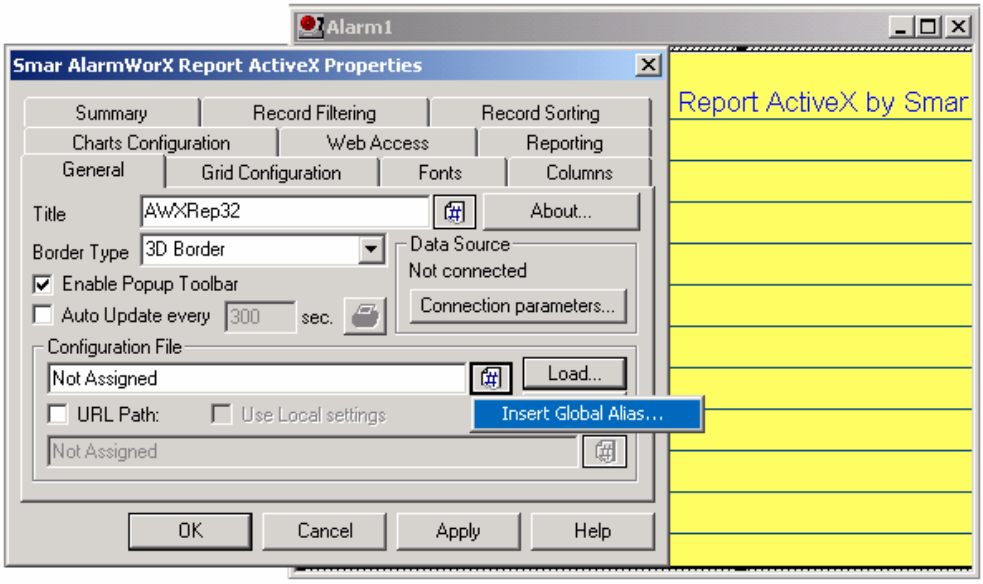
The AlarmWorX Report ActiveX supports Global Aliasing by interfacing to the Smar Global Aliasing System Engine Server.

Currently the AlarmWorX Report ActiveX supports machine-level and process-level aliasing. All fields that support aliasing have been interfaced to the Global Alias Browser dialog, which is evoked by clicking on the **…** button in the configuration.

In addition, the AlarmWorX Report ActiveX now has an integrated Global Alias Browser.

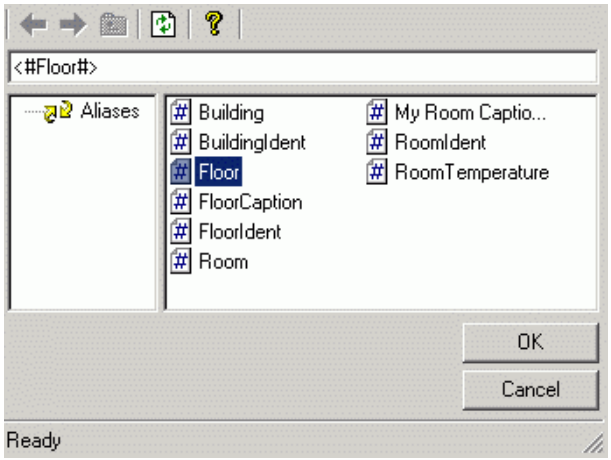
When specifying a global alias in the **Alarm Report ActiveX Properties** dialog box, you can also select a global alias from the **Global Alias Browser,** which includes all global aliases in the Global Aliasing System database. This eliminates the need to manually type in the alias name. Clicking the **...** button and selecting **Global Alias Browser** from the pop-up menu opens the Global Alias Browser, as shown in the figure below. The Global Alias Browser is available for the following:

- **Title, Configuration File,** and **URL Path** sections of the **Alarm Report ActiveX Properties** dialog box **General** tab
- Records filtering



Opening the Global Alias Browser in the Report Properties

All global aliases that are configured in the Global Alias Engine Configurator are conveniently available to choose from inside the browser. The tree control of the Global Alias Engine Configurator is mimicked in the tree control of the Global Alias Browser. Select a global alias by double-clicking the alias name (e.g. "Floor" in the figure below). The alias name appears at the top of the browser, which automatically adds the <# and #> delimiters to the alias name. Click the **OK** button.

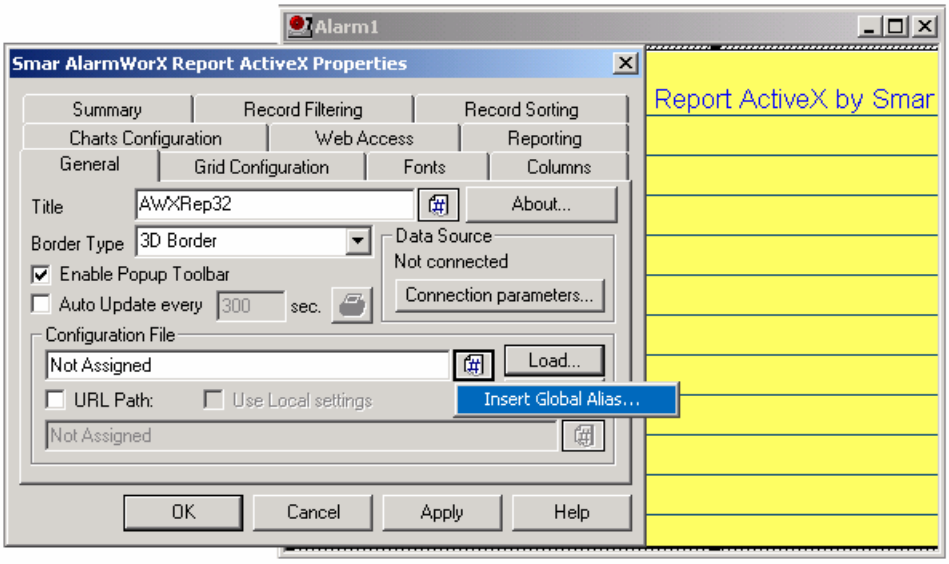


Selecting an Alias From the Global Alias Browser

Asynchronous Downloading features

The AlarmWorX Report ActiveX supports asynchronous downloading of configuration data when used inside SMAR ActiveX document servers, such as GraphWorX, to produce documents, which can be viewed using Microsoft Internet Explorer.

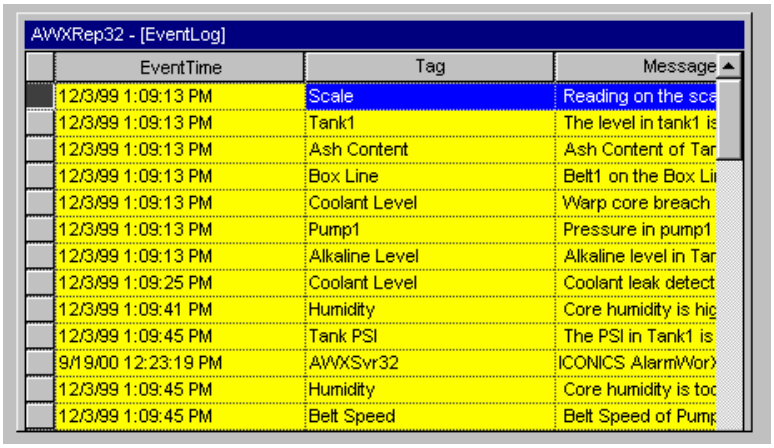
To enable this feature, select **URL Path** from the **General** tab of the **Alarm Report ActiveX Properties** dialog box, shown below, and supply a URL path. In the case of viewing ActiveX documents within an intranet setup, you can supply a server name and directory specifying the location of the AlarmWorX Report configuration data (must be a shared directory), by using the convention "file:\\Server Name\Directory\File Name.awr."



Alarm Report ActiveX Properties: General Tab

Runtime Mode

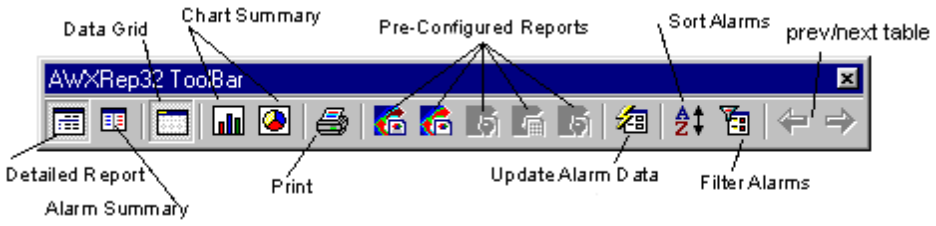
To enter runtime, either click the **Enter Runtime** button on the toolbar or select **Runtime Mode** from the **Actions** menu. Once in runtime, the following data grid appears.



Runtime Mode

Note: If runtime mode does not show any data, make sure you have established a connection with an Alarm Logger database. You can connect to a database by clicking **Connection Parameters** on the **General** tab of the **Alarm Report ActiveX Properties** dialog box while in configuration mode. Also, if you deleted one of the three default columns (EventTime, Tag, or Message), the Report ActiveX will be disabled in runtime mode.

Double-clicking anywhere on the Alarm Report ActiveX during runtime mode opens the **Alarm Report** toolbar, as shown in the figure below. Using the toolbar, you can execute certain operations and change how the data are viewed.

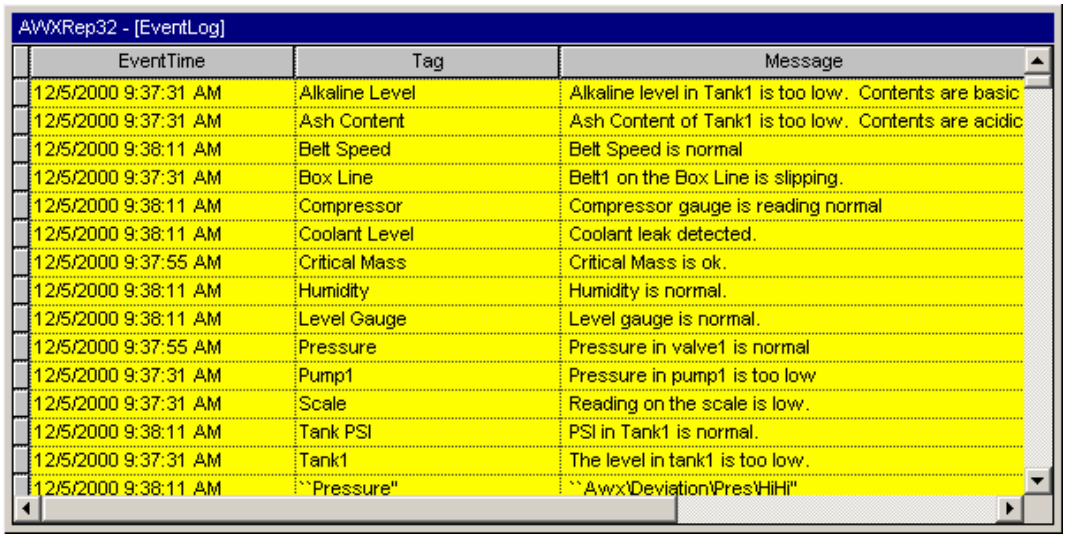


Alarm Report Toolbar

There are two different views to choose from: Data Grid or Chart Summary. When viewing the Data Grid, you can further choose from a detailed report or a summary report. These views are described in the sections below along with the other tool button options.

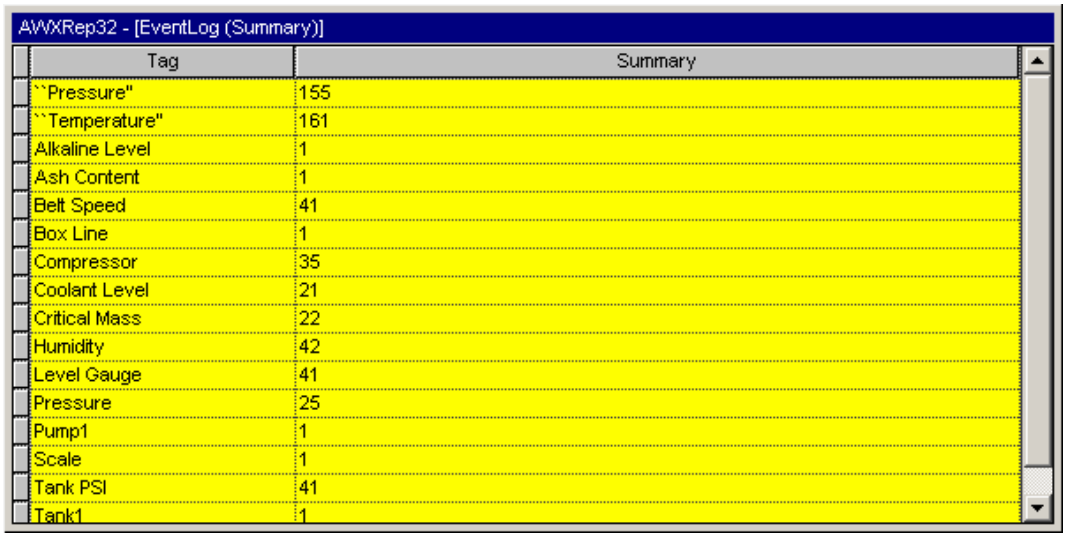
Data Grid

By default, the Alarm Report ActiveX runtime screen displays the **Data Grid > Details** view, as shown below. The Data Grid displays all data for the alarms in the report. The reported elements are determined by the columns selected during configuration. Additionally, you may be able to change the view slightly by changing the width of the columns (if this option was enabled during configuration).



Data Grid Details View in Runtime Mode

To view a summary of the data, double-click the grid and then click the **Alarm Summary** button on the **Alarm Report** toolbar. The view changes to display only the Tag name and the Alarm Summary, as shown in the figure below. The data are listed, from highest to lowest, by the number of alarms.



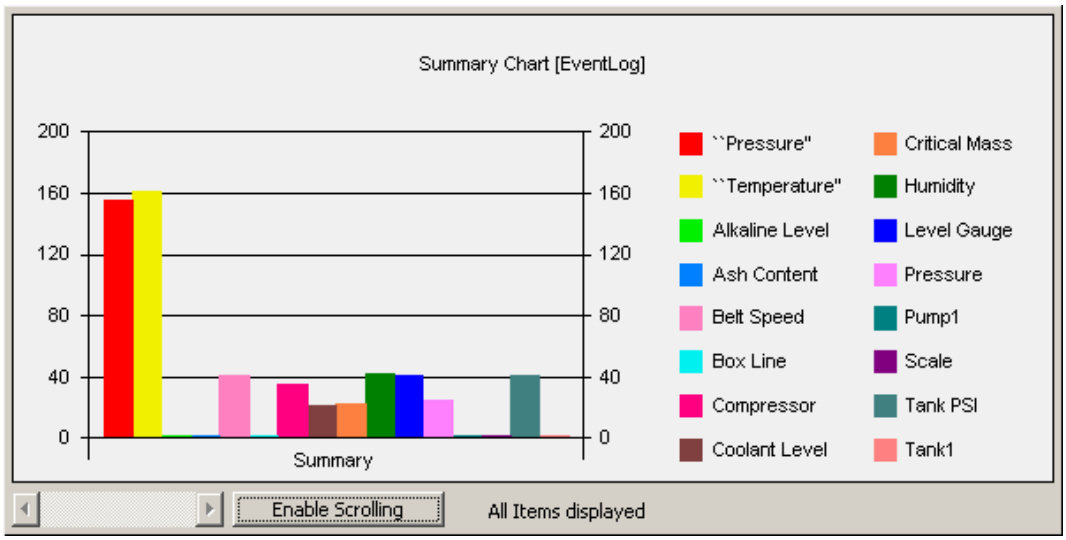
Data Grid Summary View in Runtime Mode

Chart Summary

To view a bar chart or pie chart summary of the Alarm Report data during runtime mode, double-click the Alarm Report ActiveX and then click the **Chart Summary** buttons on the **Alarm Report** toolbar. The number of items charted depends on the options selected on the **Record Filtering** tab of the **Alarm Report ActiveX Properties** dialog box. If no filters are enabled, all alarm types are charted.

Bar Charts

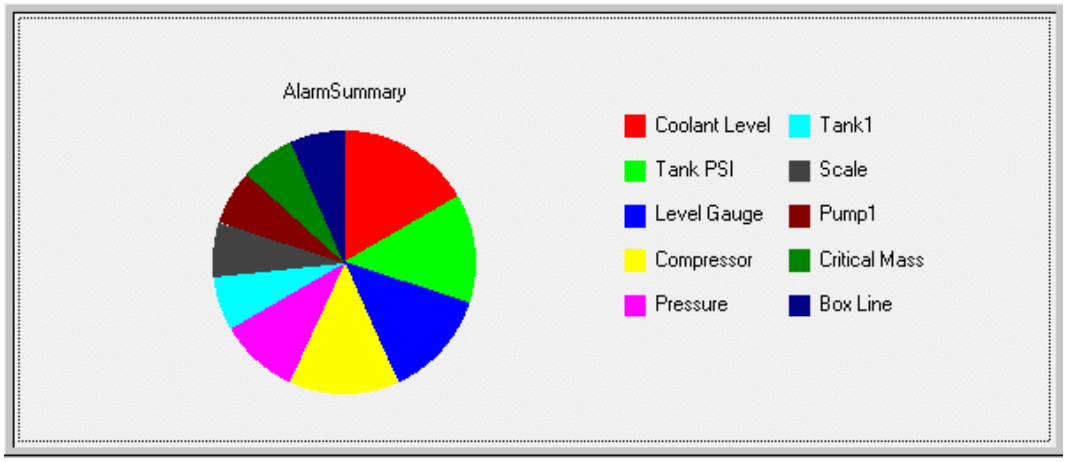
A **Bar Summary Chart,** shown in the figure below, shows how many alarms of each type are present in the database that is being reported. If scrolling was enabled in the **Charts Configuration** tab of the **Alarm Report ActiveX Properties** dialog box, an **Enable Scrolling** button appears at the base of the bar chart summary, as shown below. Click this button to scroll left or right between bars on the chart using the arrows.



Bar Chart Summary

Pie Charts

A **Pie Summary Chart,** shown in the figure below, shows what percentage of each alarm type exists in the report.



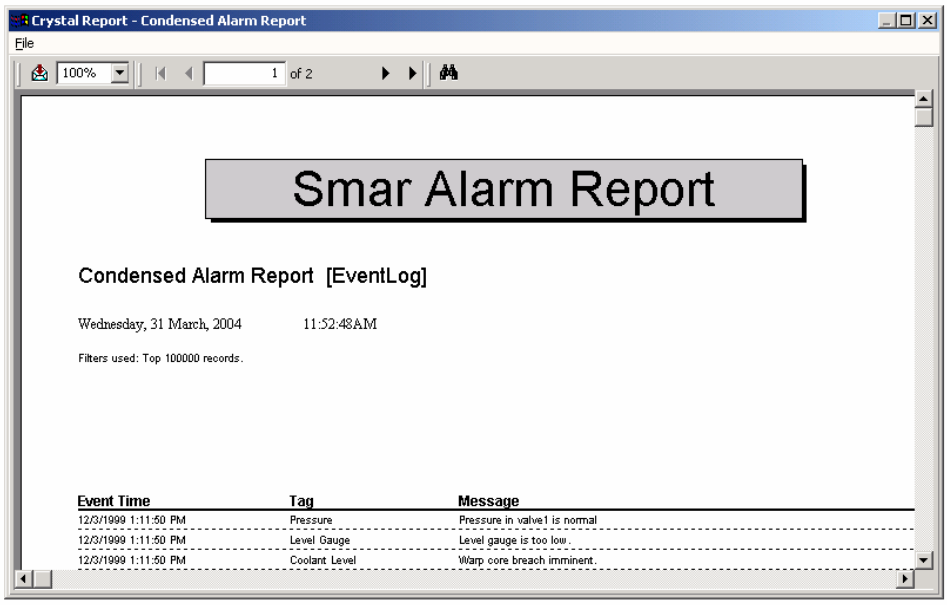
Pie Chart Summary

Printing Current Alarms

The **Print Current Alarms** button on the **Alarm Report** toolbar opens the standard **Print** dialog box, where you can choose your printing settings. The current view will be printed with the date, time, description, and page number at the top of the page.

Choosing a Crystal Report Template

If you have configured any reporting templates on the **Reporting** tab in configuration mode, you will see one to five reports on the **Alarm Report** toolbar from which to choose. Clicking on a report button launches a Crystal Reports viewer, showing the selected report. From there, all of the features of Crystal Reports are at your disposal for printing, formatting, and saving your report. A sample Crystal Report is shown below.



Sample Report

Updating Alarm Data

Clicking the **Update Alarm Data** button on the **Alarm Report** toolbar refreshes the data shown in the Alarm Report ActiveX during runtime with the most current alarm data from the connected Alarm Logger database.

Adjusting Column Width

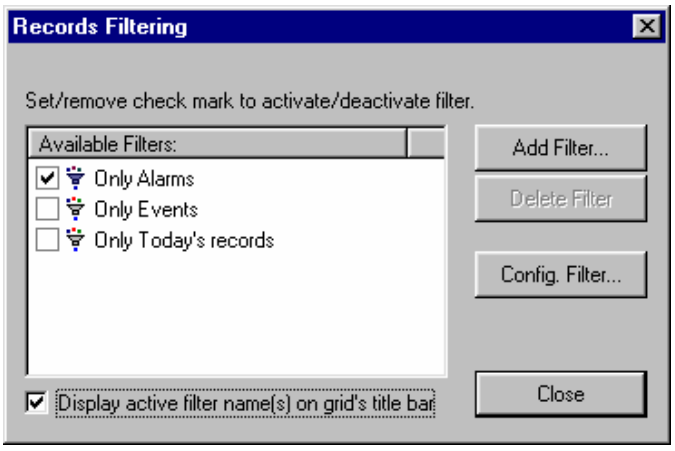
During runtime mode, you can adjust each column in the Alarm Report ActiveX data grid independently by moving the cursor over the vertical line between each column (a double arrow will appear) and moving the line while holding down the mouse button.

Sorting and Filtering Data Using the Alarm Report Toolbar

The last two buttons before the left and right arrows on the **Alarm Report** toolbar are used to sort and filter the alarm data.

Clicking the **Sort Alarms** button on the toolbar opens the **Sorting Fields** dialog box accessed through the **Records Sorting** tab of the **Alarm Report ActiveX Properties** dialog box.

Clicking the **Filter Alarms** button on the toolbar opens the **Records Filtering** dialog box, shown below. For information about adding, removing, and configuring filters, please see the **Record Filtering** section.



Alarm Filtering

OLE Automation

Introduction

This reference describes the OLE Automation features available in the AlarmWorX Report.

Automation Interfaces

The AlarmWorX Report provides a COM interface that allows automation interfaces run from within the ActiveX container to manipulate the Report ActiveX control as it is running. The interface is available to all programming languages that support COM, including Visual Basic (VB), Visual Basic for Applications (VBA), and Microsoft Visual C^{++}.

To access the Automation interface from VB and VBA, AlarmWorX Report must be made available by choosing **Project > Components** from the main menu in the VB or VBA development environment and selecting **Smar AWXRep ActiveX** in the list of available components.

The description of every property or method in this reference is followed by the code example for typical use of that property or method. The example code is written in Visual Basic for Applications (VBA) language, built in the AlarmWorX container application (Awx.exe). It assumes that AWXRep ActiveX is embedded within **AlarmWorX** display and its name property is set to "AWXRep1."

Available Control Properties

AWXRepTitle

Type: String

Description

Sets/gets title string on General property page.

Example

```
Dim strNewTitle as String
ThisDocument.AWXRep1.AWXRepTitle=strNewTitle
```

AppearanceMode

Type: Long

Description

Determine the appearance of data grid. This property can be one of the following:

0 - flat look

1 - 3D look

Example

Sets 3D look for the grid.

```
ThisDocument.AWXRep1.AppearanceMode=1
```

BackColor

Type: OLE_COLOR

Description

Sets/gets grid background color.

Example

Sets grid background color to cyan.

```
ThisDocument.AWXRep1.BackColor=RGB(0,255,255)
```

BorderType

Type: String

Description

Set/get control's border appearance. Can be one of the following:

"0" - none

"1" - flat border

"2" - 3D border

Example

Set 3D look for the control's border.

```
ThisDocument.AWXRep1.BorderType="2"
```

ChartBackColor

Type: OLE_COLOR

Description

Set/get summary chart background color.

Example

Set summary chart background color to white.

```
ThisDocument.AWXRep1.ChartBackColor=RGB(255,255,255)
```

ChartLegendHeight

Type: Short

Description

These properties determine the dimensions of the corresponding chart element. The width and height of a particular chart element are given in percents of the total width or height of the chart area.

ChartLegendLeft

ChartLegendTop

Type: Short

Description

These properties determine the location of the corresponding chart element within the chart area. The coordinates are given in percents of the total width or height of the chart area, assuming that the coordinate origin (point {0, 0}) is located at the left top corner of the chart area.

ChartLegendVisible

Type: Boolean

Description

These properties set/get the visibility of chart legend and/or title. Setting either property to FALSE will hide the corresponding chart element.

Default value: TRUE

ChartLegendWidth

Type: Short

Description

These properties determine the dimensions of the corresponding chart element. The width and height of a particular chart element are given in percents of the total width or height of the chart area.

ChartPlotHeight

Type: Short

Description

These properties determine the dimensions of the corresponding chart element. The width and height of a particular chart element are given in percents of the total width or height of the chart area.

ChartPlotLeft

ChartPlotTop

Type: Short

Description

These properties determine the location of the corresponding chart element within the chart area. The coordinates are given in percents of the total width or height of the chart area, assuming that the coordinate origin (point {0, 0}) is located at the left top corner of the chart area.

ChartPlotWidth

Type: Short

Description

These properties determine the dimensions of the corresponding chart element. The width and height of a particular chart element are given in percents of the total width or height of the chart area.

ChartTitle

Type: String

Description

Set/get a string value that appears in the summary chart title area.

Example

```
ThisDocument.AWXRep1.ChartTitle="Alarm Summary By Tags"
```

ChartTitleHeight

Type: Short

Description

These properties determine the dimensions of the corresponding chart element. The width and height of a particular chart element are given in percents of the total width or height of the chart area.

ChartTitleLeft

ChartTitleTop

Type: Short

Description

These properties determine the location of the corresponding chart element within the chart area. The coordinates are given in percents of the total width or height of the chart area, assuming that the coordinate origin (point {0, 0}) is located at the left top corner of the chart area.

ChartTitleUpdateOnDataSelect

Type: Boolean

Description

Set/get the value of a flag that determines whether the chart title is updated when user clicks on a data series (either bar or pie segment) inside the plot. If set to TRUE (default), the name of selected data series is attached to the chart title.

ChartTitleVisible

Type: Boolean

Description

These properties set/get the visibility of chart legend and/or title. Setting either property to FALSE will hide the corresponding chart element.

Default value: TRUE

ChartTitleWidth

Type: Short

Description

These properties determine the dimensions of the corresponding chart element. The width and height of a particular chart element are given in percents of the total width or height of the chart area.

ChartType

Type: Integer

Description

Set/get the type of alarm summary chart. Can be one of the following:

0 - bar type

1 - pie type

Example

Set summary chart to pie type.

```
ThisDocument.AWXRep1.ChartType=1
```

Columns

Type: String

Description

Sets/gets comma-separated list of database columns to be shown on grid.

Example

This line configures control to show only EventTime, Tag and Message columns.

```
ThisDocument.AWXRep1.Columns="EventTime, Tag, Message"
```

Remarks

If database column name contains one or more space characters, the column name should be enclosed in square brackets, as in this example:

```
ThisDocument.AWXRep1.Columns="[Column 1], [Column 2]"
```

ConnectionString

Type: String

Description

Sets/gets ADO connection string used by AWXReport control to access data.

Example

```
Dim strConnString as String
strConnString="Provider=Microsoft.Jet.OLEDB.4.0; _
    Data Source=c:\alarms\AWXLog.mdb; _
    User ID=Admin; Password=SYSTEM"
ThisDocument.AWXRep1. ConnectionString = strConnString
```

DisplayActiveFilterName

Type: Boolean

Description

Set/get Boolean value that controls whether the active filter(s) name(s) is(are) shown on the grid title bar.

Example

```
ThisDocument.AWXRep1. DisplayActiveFilterName = TRUE
```

DisplayGridTitle

Type: Boolean

Description

Set/get Boolean value that controls the visibility of the grid title bar.

Example

```
ThisDocument.AWXRep1. DisplayGridTitle = TRUE
```

EnableToolbar

Type: Boolean

Description

Setting this property to FALSE prohibits the floating toolbar to pop up when user double-clicks inside the control.

Default value - TRUE.

Example

To disable tools

```
ThisDocument.AWXRep1.EnableTools=FALSE
```

FilteringString

Type: String

Description

Set/get SQL WHERE statement that determines filtering of alarm data.

Example

These statements configure control to show only Humidity alarms or Pressure alarms.

```
Dim strFiltrStmt as String
strFiltrStmt="WHERE  (Tag='Humidity' OR Tag='Pressure') "
ThisDocument.AWXRep1. FilteringString = strFiltrStmt
```

Font

Type: StdFont

Description

Return a reference to the control's default font.

Example

To set control's default font to Arial, 14 pt., use the following statements:

```
With ThisDocument.AWXRep1.Font
.Name="Arial"
.Size=14
End With
```

ForeColor

Type: OLE_COLOR

Description

Set/get Forecolor property of data grid.

Example

```
ThisDocument.AWXRep1. ForeColor=RGB(0,0,0)
```

GridBackColor

Type: OLE_COLOR

Description

Set/get color value used to paint the gaps between rightmost column and right edge of the grid, last row and bottom edge of the grid, and row headers column (the 'back area' of the grid).

Example

```
ThisDocument.AWXRep1. GridBackColor =RGB(0,127,0)
```

GridBorderStyle

Type: Long

Description

Set/get the style of data grid border. Can be one of the following:

0 - no border

1 - fixed single border style

Example

```
ThisDocument.AWXRep1.GridBorderStyle=1
```

GridDefRowHeight

Type: Integer

Description

Set/get the default row height for data grid.

Example

```
ThisDocument.AWXRep1. GridDefRowHeight=16
```

GridHorizLinesColor and GridVertLinesColor

Type: OLE_COLOR

Description

Set/get color for horizontal or vertical grid lines.

Example

```
ThisDocument.AWXRep1. GridHorizLinesColor =RGB(127,127,127)
ThisDocument.AWXRep1. GridVertLinesColor = RGB(127,127,127)
```

GridHorizLinesStyle and GridVertLinesStyle

Type: Integer

Description

Set/get style for horizontal or vertical grid lines. Can be one of the following:

0 - no line

1 - solid line

2 - dot line

3 - dashdot line

4 - dashdotdot line

Example

```
ThisDocument.AWXRep1. GridHorizLinesStyle =0
ThisDocument.AWXRep1. GridVertLinesStyle = 2
```

GridHorizLinesWidth and GridVertLinesWidth

Type: Integer

Description

Set/get the widths for the horizontal or vertical grid lines when corresponding grid line style (property **GridHorizLinesStyle** or **GridVertLinesStyle**) is set to 1 - solid line. For all other line styles, these properties must be set to 1.

Example

Sets both horizontal and vertical grid lines to solid line style, 2 pixels wide.

```
ThisDocument.AWXRep1. GridHorizLinesStyle =1
ThisDocument.AWXRep1. GridVertLinesStyle = 1
ThisDocument.AWXRep1. GridHorizLinesWidth =2
ThisDocument.AWXRep1. GridVertLinesWidth = 2
```

GridTitleBackColor

Type: OLE_COLOR

Description

Set/get the background color for the grid's title bar.

Example

Sets title bar background color to dark blue.

```
ThisDocument.AWXRep1. GridTitleBackColor =GRB(0,0,127)
```

GridTitleTextColor

Type: OLE_COLOR

Description

Set/get the text color for the grid's title bar.

Example

Sets grid's title bar text color to yellow.

```
ThisDocument.AWXRep1. GridTitleBackColor =GRB(255,255,0)
```

HeaderColor

Type: OLE_COLOR

Description

Set/get the background color for grid's column headers.

Example

Sets color of grid's column header to dark green.

```
ThisDocument.AWXRep1. GridTitleBackColor =GRB(0,127,0)
```

IsConnected

Type: Boolean

Description

This is read-only property, indicating that control is connected to the database.

Example

```
If  ThisDocument.AWXRep1.IsConnected Then
   ``` do something here  ```
End If
```

NoSorting

Type: Boolean

Description

Set/get **Boolean** value that indicates whether records sorting has been enabled or not. By default, this property is set to TRUE (sorting disabled), providing best data retrieval performance.

Example

To enable sorting:

```
ThisDocument.AWXRep1.NoSorting=FALSE
```

QueryText

Type: String

Description

Set/get the SQL statement used to populate data grid in detailed report mode.

Example

```
Dim strQry as String
strQry=ThisDocument.AWXRep1.QueryText
MsgBox strQry
```

Remarks

Though this property is read/write, it is not recommended to set **QueryText** directly. Instead, you can set the **Columns**, **FilteringString,** and **SortingString** properties, then the value of **QueryText** will be automatically updated.

QueryTextSummary

Type: String

Description

Set/get the SQL statement used to populate data grid in alarm summary mode.

Example

```
Dim strQrySmr as String
strQrySmr=ThisDocument.AWXRep1.QueryTextSummary
MsgBox strQrySmr
```
```

Remarks

Though this property is read/write, it is not recommended to set **QueryTextSummary** directly. Instead, you can set the **SummaryColumn**, **FilteringString**, **SortingString,** or **SummaryFieldSortDir** properties. The value of **QueryTextSummary** will then be automatically updated.

ReportFileAlarms

These properties should be considered obsolete in version 6.1. They are supported only for backwards compatibility.

RowDividerStyle

Type: String

Description

Set/get the appearance of row divider on data grid (horizontal grid lines). Can be one of the following:

0 - No dividers

1 - Black line

2 - Dark gray line

3 - Raised

4 - Inset

5 - Use ForeColor

6 - Light gray line

This property can be used to set the appearance of both vertical and horizontal grid lines in one statement. The same can be done using the **GridHorizLineColor** and **GridVertLinesColor** properties independently.

Example

To set Black row divider:

```
ThisDocument.AWXRep1.RowDividerStyle=1
```

ShowSummaryChart

Type: Boolean

Description

Set/get the **Boolean** value that controls how alarm records are reported. Use this property to toggle between **Chart** and **Grid Display** modes.

Examples

This statement brings control into **Chart Display** mode:

```
ThisDocument.AWXRep1. ShowSummaryChart=TRUE
```

This statement brings control into **Grid Display** mode:

```
ThisDocument.AWXRep1. ShowSummaryChart=FALSE
```

ShowSummaryGrid

Type: Boolean

Description

Set/get the **Boolean** value that controls how alarm records are reported in **Grid Display** mode. Use this property to toggle between **Detailed** and **Summary** views in **Grid Display** mode.

Remarks

If control is in the **Chart** mode, setting **ShowSummaryGrid** property will not have immediate effect. Only after **ShowSummaryChart** property is switched to FALSE (**Grid** mode), will the desired grid view be displayed.

Examples

These statements bring the control into **Detailed Grid Display** mode:

```
ThisDocument.AWXRep1. ShowSummaryChart =FALSE
ThisDocument.AWXRep1. ShowSummaryGrid =FALSE
```

This statement brings the control into **Summary Grid Display** mode:

```
ThisDocument.AWXRep1. ShowSummaryGrid =TRUE
```

SortByDblClick

Type: Boolean

Description

Set/get **Boolean** value indicating that records will be sorted by values in the particular grid's column when user double-clicks on that column's header. Subsequent double clicks on the same column header will reverse sorting direction.

Remarks

The sorting action will occur only if the **NoSorting** property is set to FALSE.

Example

```
ThisDocument.AWXRep1. NoSorting =FALSE
ThisDocument.AWXRep1. SortByDblClick=TRUE
```

SortingString

Type: String

Description

Set/get SQL ORDER BY statement that determines sorting of alarm data.

Example

Configures control to sort alarm data by EventTime in ascending order.

```
Dim strSortStmt as String
strSortStmt="ORDER BY EventTime ASC "
ThisDocument.AWXRep1. SortingString = strSortStmt
```

SummaryColumn

Type: String

Description

Set/get database column name, by which the alarm records are grouped for **Summary Grid** view and **Summary Chart.** By default, this is "[Tag]" column.

Example

This statement changes the database column to summarize records by "Area":

```
ThisDocument.AWXRep1.SummaryColumn="[Area]"
```

SummaryFieldSortDir

Type: Integer

Description

Set/get sort direction for the **Summary** field on the **Summary Grid** view or **Summary Chart.** Can be one of the following:

0 - ascending

1 - descending

Example

This statement changes the **Summary** field sort direction to descending:

```
ThisDocument.AWXRep1. SummaryFieldSortDir=1
```

TableName

Type: String

Description

Set/get name of the current database table.

Example

```
ThisDocument.AWXRep1.TableName="EventLog"
```

ToolsVisible

Type: Boolean

Description

Set/get visibility of toolbar.

Example

To show toolbar:

```
ThisDocument.AWXRep1.ToolsVisible=TRUE
```

ToolXPos

Type: Integer

Description

Set/get the X coordinate of toolbar's left top corner (in device units).

Example

```
ThisDocument.AWXRep1.ToolXPos=255
```

ToolYPos

Type: Integer

Description

Set/get the Y coordinate of toolbar's left top corner (in device units).

Example

```
ThisDocument.AWXRep1.ToolYPos=100
```

AutoUpdateInterval

Type: Short

Description

Set/get the number of seconds between automatic updates.

Example

ThisDocument.AWXRep1.AutoUpdateInterval=60

BlinkOnUpdate

Type: Boolean

Description

Set/get whether or not the Report ActiveX will blink on update.

Example

ThisDocument.AWXRep1.BlinkOnUpdate=True

ChartGlobalScaling

Type: Boolean

Description

Enable/disable global scaling of the chart.

Example

ThisDocument.AWXRep1.ChartGlobalScaling=True

ChartScrolling

Type: Boolean

Description

Enable/disable chart scrolling.

Example

ThisDocument.AWXRep1.ChartScrolling=True

ChartScrollSize

Type: Short

Description

Indicates how many items you can scroll through on the chart at one time.

Example

ThisDocument.AWXRep1.ChartScrollSize=10

ChartTruncateNumber

Type: Short

Description

Sets/gets the size at which long strings are truncated. Must have ChartTruncateStrings property set to “True” in order for this to take effect.

Example

ThisDocument.AWXRep1.ChartTruncateNumber=8

ChartTruncateStrings

Type: Boolean

Description

Enable/disable the truncation of strings longer than the ChartTruncateNumber.

Example

ThisDocument.AWXRep1.ChartTruncateStrings=True

EnableAutoUpdate

Type: Boolean

Description

Enable/disable automatic updates.

Example

ThisDocument.AWXRep1.EnableAutoUpdate=True

EnableWebAccess

Type: Boolean

Description

Enable/disable Report ActiveX web access.

Example

ThisDocument.AWXRep1.EnableWebAccess=True

FileName

Type: BSTR

Description

Set/get the name of the Report ActiveX configuration file.

Example

ThisDocument.AWXRep1.FileName=”C:\AwxRepConfig.awr”

MaxRecords

Type: Long

Description

Set/get the maximum number of records that the Report ActiveX will fit.

Example

ThisDocument.AWXRep1.MaxRecords=1024

RemoteDataServer

Type: BSTR

Description

This is the Internet Information Server for remote data access.

Example

ThisDocument.AWXRep1.RemoteDataServer = “http://localhost”

URLPathName

Type: BSTR

Description

Set/get the URL path for a configuration file over the web. Must set URLPathUsed to “True” for this to take effect.

Example

ThisDocument.AWXRep1.URLPathName=
”http://www.smar.com/awxrepcfg.awr”

URLPathUsed

Type: Boolean

Description

Enable/disable the use of a URL path.

Example

ThisDocument.AWXRep1.URLPathUsed=True

UseLocalSettings

Type: Boolean

Description

Tell a URL-enabled Report ActiveX whether or not to use local settings.

Example

ThisDocument.AWXRep1.UseLocalSettings=True

Available Control Methods

AboutBox

Shows **About** dialog box.

Example

```
ThisDocument.AWXRep1.AboutBox
```

Connect As Boolean

Forces the control to establish connection to database, using the information set in **ConnectionString** and **TableName.** If control is already connected, the current connection will be closed and a new connection will be established. This method can be used in VBA scripts automatically to switch the report ActiveX between different databases.

Return Value

On success, returns TRUE; if for any reason connection cannot be established, returns FALSE.

Example

```
Dim strConnString as String
strConnString="Provider=Microsoft.Jet.OLEDB.4.0; _
Data Source=c:\alarms\SomeOtherDatabase.mdb; _
User ID=Admin; Password=SYSTEM"
ThisDocument.AWXRep1. ConnectionString = strConnString
ThisDocument.AWXRep1.TableName="SomeOtherTable"
ThisDocument.AWXRep1.Connect
ThisDocument.AWXRep1.Refresh
```

GetColumnHeaderText(iColIndex As Integer) As String

Returns the header text for the grid column specified by iColIndex argument. The iColIndex argument is 1 - based index of the column, counting from the left of the grid. In **Summary Grid** view, iColIndex can be either 1 or 2; in **Detailed Grid** view, it can be from 1 to the maximum number of entries in the **Columns** property

Example

```
Dim strHeader1
strHeader1=ThisDocument.AWXRep1.GetColumnHeaderText(1)
```

GetColumnWidth(iColIndex As Integer) As Integer

Returns the width of the column specified by iColIndex argument. The iColIndex argument is 1 - based index of the column, counting from the left of the grid. In **Summary Grid** view, iColIndex can be either 1 or 2; in **Detailed Grid** view, it can be from 1 to the maximum number of entries in the **Columns** property. The width is given in logical units, depending on the selected font.

Example

Retrieves the current width on the leftmost column:

```
Dim cx1 As Integer
cx1=ThisDocument.AWXRep1.GetColumnWidth(1)
```

LaunchReport(iTemplateIndex As Integer) As Integer

Create Crystal Report based on the template specified by iTemplateIndex parameter. The value of argument iTemplateIndex can be 0 through 4 (there might be up to 5 different Crystal Report templates).

Return value

On success, returns 0; if a template for certain index does not exist or is not configured (in which case the **Crystal Report** button on the toolbar at the position corresponding to that index, counting from left, is grayed), return value is (-1).

Example

Creates Crystal Report based on the third template from the left, as seen on the **Reporter's** toolbar:

```
If  ThisDocument.AWXRep1.LaunchReport(2)=-1 Then
   MsgBox " It looks like the template specified is not configured"
End If
```

Print

Description

Prints detailed alarm data, alarm summary, data or alarm summary chart depending on the current state of AWXReport control.

Example

```
ThisDocument.AWXRep1.Print
```

Refresh

Description

Update alarm data by requerying the database.

Example

```
ThisDocument.AWXRep1.Refresh
```

SetColumnHeaderText(iColIndex As Integer, strNewText As String)

Set the header text for the grid column specified by iColIndex argument. The iColIndex argument is 1 - based index of the column, counting from the left of the grid. In **Summary Grid** view, iColIndex can be either 1 or 2; in **Detailed Grid** view, it can be from 1 to the maximum number of entries in the **Columns** property.

Example

```
ThisDocument.AWXRep1.SetColumnHeaderText(1,"Column1")
```

SetColumnWidth(iColIndex As Integer, iNewWidth As Integer)

Sets the width of the column specified by iColIndex argument to iNewWidth. The iColIndex argument is 1 - based index of the column, counting from the left of the grid. In **Summary Grid** view, iColIndex can be either 1 or 2; in **Detailed Grid** view, it can be from 1 to the maximum number of entries in the **Columns** property. The width is given in logical units, depending on the selected font.

Example

Doubles the current width on the leftmost column:

```
Dim cx1 As Integer
cx1=ThisDocument.AWXRep1.GetColumnWidth(1)
ThisDocument.AWXRep1.SetColumnWidth(1, 2*cx1)
```

LoadConfigFile(BSTR newVal) as Boolean

Load the configuration file specified in newVal.

Example

```
Dim ret As Boolean
ret = AWXRep1.LoadConfigFile(“C:\My Configs\cfg.awr”)
```

SaveConfigFile(BSTR newVal) as Boolean

Saves your current Report ActiveX configuration to the file specified in newVal.

Example

```
Dim ret As Boolean
ret = AWXRep1.SaveConfigFile(“C:\My Configs\cfg.awr”)
```

LoadConfigURL(BSTR newVal) as Boolean

Load the configuration file specified in the URL string newVal.

Example

```
Dim ret As Boolean
ret = AWXRep1.LoadConfigURL(“http://localhost/cfg.awr”)
```

SetDBType(short NewDBType)

Set the database type.

Example

```
AWXRep1.SetDBType(1)
```

GetColumnsNumber() as Short

Return the number of columns in your current report configuration.

Example

```
MsgBox AWXRep1.GetColumnsNumber
```

GetFiltersNumber() as Short

Return the number of filters currently available to your report.

Example

```
MsgBox AWXRep1.GetFiltersNumber
```

GetSortEntriesNumber() as Short

Return the number of columns on which your report is currently sorting.

Example

```
MsgBox AWXRep1.GetSortEntriesNumber
```

GetColumn(short iIndex) as OGridColumnWrapper

Get the Column object corresponding to iIndex. Returns “Nothing” if the index is invalid. Column index numbers start at 1.

Example

```
Dim col As OGridColumnWrapper
Set col = AWXRep1.GetColumn(1)
```

AddColumn(BSTR newCol) as OGridColumnWrapper

Adds the specified column to your report. Returns “Nothing” if argument is not a valid column name. You can then modify the column through the OGridColumnWrapper automation properties and methods.

Example

```
Dim col As OGridColumnWrapper
Set col = AWXRep1.AddColumn(“Severity”)
```

SwitchColumns(short iIndex1, short iIndex2)

Switch the display order of the two columns corresponding to the specified indices. Returns "Nothing" if the column index is invalid.

Example

```
AWXRep1.SwitchColumns(1,2)
```

DeleteColumn(short iIndex)

Deletes the column corresponding to the specified index. Returns "Nothing" if the column index is invalid.

Example

```
AWXRep1.DeleteColumn(2)
```

GetSummaryColumn(short iIndex) as OGridSummaryColumnWrapper

Gets the OGridSummaryColumnWrapper object corresponding to the specified column index. The summary column is the header associated with each column. Returns "Nothing" if the column index is invalid.

Example

```
Dim sumcol As OGridSummaryColumnWrapper
Set sumcol = AWXRep1.GetSummaryColumn(1)
```

UpdateColumnsInfo()

Forces a refresh of the column information.

Example

```
AWXRep1.UpdateColumnsInfo
```

GetFilter(short iIndex) as OFilterWrapper

Gets the filter corresponding to the specified index.

Example

```
Dim filter As OFilterWrapper
Set filter = AWXRep1.GetFilter(1)
```

AddFilter(BSTR newCol) as OFilterWrapper

Adds a filter on the specified column. You can then modify the filter through the OFilterWrapper automation properties and methods.

Example

```
Dim filter As OFilterWrapper
Set filter = AWXRep1.AddFilter("Severity")
```

DeleteFilter(short iIndex)

Deletes the specified filter.

Example

```
AWXRep1.DeleteFilter(1)
```

UpdateFiltersInfo()

Forces an update of the filter information.

Example

```
AWXRep1.UpdateFiltersInfo
```

GetSortEntry(short iIndex) as OSortEntryWrapper

Returns an OSortEntryWrapper object corresponding to the specified index. Returns “Nothing” if the index is invalid.

Example

```
Dim sort As OSortEntryWrapper
Set sort = AWXRep1.GetSortEntry(1)
```

AddSortEntry(BSTR newCol) as OSortEntryWrapper

Adds a sort for the specified column. You can then modify the sort entry through the OSortEntryWrapper automation properties and methods.

Example

```
Dim sort As OSortEntryWrapper
Set sort = AWXRep1.AddSortEntry(“Tag”)
```

DeleteSortEntry(short iIndex)

Deletes the sort entry corresponding to the specified index.

Example

```
AWXRep1.DeleteSortEntry(1)
```

UpdateSortInfo()

Forces an update of the sort entry information.

Example

```
AWXRep1.UpdateSortInfo
```

SwitchSortEntries(short iIndex1, short iIndex2)

GetCellText(integer iColumnIndex, long iRowIndex) as VARIANT

Returns the contents of the cell specified by the grid coordinates.

Example

```
Dim cell As Variant
cell = AWXRep.GetCellText(1,1)
MsgBox cell
```

GetGridRowCount() as VARIANT

Returns the number of rows in the grid. Returns –1 if there are no records or the database is not yet connected.

Example

```
Msgbox AWXRep1.GetGridRowCount
```

GetSelectedRowIndex() as VARIANT

Returns the index of the row that is currently selected. Returns –1 if no cell is selected.

Example

```
MsgBox AWXRep1.GetSelectedRowIndex
```

GetSelectedColIndex() as VARIANT

Returns the index of the column that is currently selected. Returns –1 if no cell is selected.

Example

```
MsgBox AWXRep1.GetSelectedColIndex
```

PrintToDefault(numOfCopies as Integer, orientation as Integer) as Long

Sends the current report to the default printer. Use 0 for portrait orientation and 1 for landscape.

Example

```
AWXRep1.PrintToDefault(1,0)
```

PrintToDevice(BSTR strDriverName, BSTR strDeviceName,BSTR strPortName, numberOfCopies as Integer, orientation as Integer) as Long

Prints to the specified device.

CanNavigateNextTable() as Boolean

Returns whether or not the report can navigate to the next table. Returns false if there are no other tables.

Example

```
MsgBox AWXRep1.CanNavigateNextTable
```

CanNavigatePrevTable() as Boolean

Returns whether or not the report can navigate to the previous table. Returns false if there are no other tables.

Example

```
MsgBox AWXRep1.CanNavigatePrevTable
```

NavigateNextTable()

Navigates to the next available table. Does nothing if no other tables exist, or this is the last table already.

Example

```
MsgBox AWXRep1.NavigateNextTable
```

NavigatePrevTable()

Navigates to the previous table. Does nothing if you are already on the first table.

Example

```
MsgBox AWXRep1.NavigatePrevTable
```

PrintReport(short iReportIndex, short nCopies, long lStartPage, long lEndPage) as Short

Prints the report to the default printer from page X to page Y.

Example

```
ret = AWXRep1.PrintReport(1, 1, 1, 5)
```

PrintReportToDevice(short iReportIndex, BSTR strDriverName, BSTR strDeviceName,BSTR strPortName, short nCopies, long lStartPage, long lEndPage) as Short

Prints the report to the specified device from page X to page Y.

GetHighlightedRange() as VARIANT

Returns a pair of coordinates corresponding to the upper left selected grid and the lower right selected grid.

Example

```
Dim sel As Variant
sel = AWXRep1.GetHighlightedRange
For Each coordinate In sel
   MsgBox coordinate
Next coordinate
```

ScrollUp()

ScrollDwn()

ScrollPgUp()

ScrollPgDwn()

ScrollLeft()

ScrollRight()

ScrollPgLeft()

ScrollPgRight()

SelectGridColumn(short iIndex)

Selects the specified column in the grid.

Example

```
AWXRep1.SelectGridColumn(2)
```

GetSelectedGridColumns() as VARIANT

Returns a list of the currently selected grid columns. If no columns are selected, returns “Nothing”.

Example

```
Dim n As Variant
n = AWXRep1.GetSelectedGridColumns
```

GetAllColumns() as VARIANT

Returns a list of all columns available to the report.

Example

```
Dim cols As Variant
cols = AWXRep1.GetAllColumns
For Each col In cols
  MsgBox col
Next col
```

GetAutoPrintSupport() as IOAutoPrintSupport

Returns an OAutoPrintSupport object to be used for configuring auto printing. See the OAutoPrintSupport documentation below for its properties.

Example

```
Dim aps As OAutoPrintSupport
Set aps = AWXRep1.GetAutoPrintSupport
```

GetCRTemplate(short iReportIndex) as IOCRTemplate

Returns a Crystal Reports template object. See the OCRTemplate documentation below for more information on its properties and methods.

Example

```
Dim cr As OCRTemplate
Set cr = AWXRep1.GetCRTemplate(1)
```

ReplaceHost(BSTR OldHostName, BSTR NewHostName) as Long

Works over both data source tags and path name attributes and replaces node name **substring** within URL path only. Returns 0 on success and HRESULT when something fails.

Example

```
'similar to ReplaceTag
'VBA example, works only in configure mode
'replaces host name in whole display

Dim Status As Long
Status = ThisDisplay.ReplaceHost("Host1", "Host2")
```

```
'if Status <> 0 then there was no replacement performed or an
error occurs
If Status <> 0 Then
 MsgBox "No replacements"
Else
 MsgBox "Tags replaced"
End If
```

ReplaceFilePath(BSTR OldSubstring, BSTR NewSubstring) as Long

Works over path name parameters of pick dynamics. Returns 0 on success and HRESULT when something fails.

Example

```
'similar to ReplaceTag
'VBA example, works only in configure mode
'replaces file path in whole display

Dim Status As Long
Status = ThisDisplay.ReplaceFilePath("C:\Windows\Temp", "D:\Temp")
'if Status <> 0 then there was no replacement performed or an
error occurs
If Status <> 0 Then
 MsgBox "No replacements"
Else
 MsgBox "Tags replaced"
End If
```

ReplaceHostEx(BSTR OldHostNameSubstring, BSTR NewHostNameSubstring, BOOL MatchCase, BOOL MatchWholeWord) as Long

Works over both data source tags and path name attributes and replaces node name **substring** within URL path only, and supports case-sensitivity, wildcard strings and MatchWholeWord flag. Returns 0 on success and HRESULT when something fails.

Example

```
'similar to ReplaceTag
'VBA example, works only in configure mode
'replaces host name in whole display, regarding "case" and "whole
words" options

Dim Status As Long
Status = ThisDisplay.ReplaceHostEx("Host1", "Host2", True, True)
'if Status <> 0 then there was no replacement performed or an
error occurs
If Status <> 0 Then
 MsgBox "No replacements"
Else
 MsgBox "Tags replaced"
End If
```

Available Control Events

OnUpdate()

OnChartSeriesSelect(BSTR strSelectedItem)

OnGridSelectionChanged(boolean IsDragging)

OnGridLButtonDblClk(short iColIndex, long iRowIndex)

OnGridLButtonClicked(short iColIndex, long iRowIndex)

OnGridRButtonDblClk(short iColIndex, long iRowIndex)

OnGridRButtonClicked(short iColIndex, long iRowIndex)

OnGridMButtonDblClk(short iColIndex, long iRowIndex)

OnGridMButtonClicked(short iColIndex, long iRowIndex)

OnChartDblClick()

OnChartMouseUp(short Button, short Shift)

OnChartMouseDown(short Button, short Shift)

OnChartClicked()

Available Automation Objects

OGridColumnWrapper,
OGridSummaryColumnWrapper object properties:

HeaderTitle

Type: BSTR

Description

Sets/gets the value of the column header field.

Example

```
Dim column As OGridColumnWrapper
Set column = ThisDisplay.AWXRep1.GetColumn(1)
column.HeaderTitle = "New Column Header"
ThisDisplay.AWXRep1.UpdateColumnsInfo
```

The above example will change the header of column 1 in the Alarm Report ActiveX.

ColumnName

Type: BSTR

Description

Sets/gets the value of the column name field.

Example

```
    Dim column As OGridColumnWrapper
    Set column = ThisDisplay.AWXRep1.GetColumn(1)
    Msgbox column.ColumnName
```

The above example will display the column name for column 1.

Width

Type: Short

Description

Sets/gets the width of the column

Example

```
    Dim column As OGridColumnWrapper
    Set column = ThisDisplay.AWXRep1.GetColumn(1)
    column.Width = 100
```

The above example will set the width of column 1 equal to 100.

DataType

Type: Short

Description

Sets/gets the data type of the column

Example

```
    Dim column As OGridColumnWrapper
    Set column = ThisDisplay.AWXRep1.GetColumn(1)
    Msgbox column.DataType
```

The above example will display the data type of column 1.

ModifyFont

Type: Boolean

Description

Enables/Disables the modified cell font.

Example

```
    Dim column As OGridColumnWrapper
    Set column = ThisDisplay.AWXRep1.GetColumn(1)
    column.ModifyFont = False
```

The above example will disable the modified font for column 1.

ModifyHeadFont

Type: Boolean

Description

Enables/Disables the modified header font.

Example

```
Dim column As OGridColumnWrapper
Set column = ThisDisplay.AWXRep1.GetColumn(1)
column.ModifyHeadFont = False
```

The above example will disable modified the header font for column 1.

ModifyTextColor

Type: Boolean

Description

Enables/Disables the modified text color.

Example

```
Dim column As OGridColumnWrapper
Set column = ThisDisplay.AWXRep1.GetColumn(1)
column.ModifyTextColor = True
column.TextColor = RGB(0, 255, 0)
```

The above example will change the text color for column 1 to green.

TextColor

Type: OLE_COLOR

Description

Sets/gets the color of the column text.

Example

```
Dim column As OGridColumnWrapper
Set column = ThisDisplay.AWXRep1.GetColumn(1)
column.ModifyTextColor = True
column.TextColor = RGB(0, 255, 0)
```

The above example will change the text color for column 1 to green.

ModifyBackColor

Type: Boolean

Description

Enables/Disables the modified background color.

Example

```
Dim column As OGridColumnWrapper
Set column = ThisDisplay.AWXRep1.GetColumn(1)
column.ModifyBackColor = True
column.BackColor = RGB(0, 255, 0)
```

The above example will change the background color for column 1 to green.

BackColor

Type: OLE_COLOR

Description

Sets/gets the background color of the column.

Example

```
Dim column As OGridColumnWrapper
Set column = ThisDisplay.AWXRep1.GetColumn(1)
column.ModifyBackColor = True
column.BackColor = RGB(0, 255, 0)
```

The above example will change the background color for column 1 to green.

ModifyCell

Type: Boolean

Description

Enables/Disables changes to the cell justification and wrap text settings.

Example

```
Dim column As OGridColumnWrapper
Set column = ThisDisplay.AWXRep1.GetColumn(1)
column.ModifyCell = True
column.CellJustify = 0
```

The above example will change the column to left justified.

CellWrapText

Type: Boolean

Description

Enables/Disables column text wrapping.

Example

```
Dim column As OGridColumnWrapper
Set column = ThisDisplay.AWXRep1.GetColumn(1)
column.ModifyCell = True
column.CellWrap = True
```

The above example will enable cell wrapping.

CellJustify

Type: Short

Description

Sets/Gets the column justification

Example

```
Dim column As OGridColumnWrapper
Set column = ThisDisplay.AWXRep1.GetColumn(1)
column.ModifyCell = True
column.CellJustify = 0
```

The above example will change the column text to left justified.

HeadJustify

Type: Short

Description

Sets/Gets the column justification

Example

```
Dim column As OGridColumnWrapper
Set column = ThisDisplay.AWXRep1.GetColumn(1)
column.HeadJustify = 0
```

The above example will change the column header to left justified.

CellFont

Type: IfontDisp*

Description

Set/Get the cell font

Example

```
Dim column As OGridColumnWrapper
Set column = ThisDisplay.AWXRep1.GetColumn(1)
Dim fnt As IFontDisp
Set fnt = column.CellFont
fnt.Bold = True
fnt.Italic = True
Set column.CellFont = fnt
```

The above example will turn on bold and italic for column 1.

HeadFont

Type: IfontDisp*

Description

Sets/Gets the header font

Example

```
Dim column As OGridColumnWrapper
Set column = ThisDisplay.AWXRep1.GetColumn(1)
Dim fnt As IFontDisp
Set fnt = column.HeadFont
fnt.Bold = True
fnt.Italic = True
Set column.HeadFont = fnt
```

The above example will turn on bold and italic for column 1.

OFilterWrapper properties:

Active

Type: Boolean

Description

Activates/Deactivates the indicated filter

Example

```
Dim filter As ofilterwrapper
Set filter = ThisDisplay.AWXRep1.GetFilter(1)
filter.Active = True
ThisDisplay.AWXRep1.UpdateFiltersInfo
```

The above example will activate filter number 1.

FilterName

Type: BSTR

Description

Sets/Gets the filter name

Example

```
Dim filter As ofilterwrapper
Set filter = ThisDisplay.AWXRep1.GetFilter(1)
filter.FilterName = "New Filter"
ThisDisplay.AWXRep1.UpdateFiltersInfo
```

The above example will rename filter number 1 to the name “New Filter”.

ColumnName

Type: BSTR

Description

Sets/Gets the name of the column to filter

Example

```
Dim filter As ofilterwrapper
Set filter = ThisDisplay.AWXRep1.GetFilter(1)
filter.ColumnName = "[Tag]"
ThisDisplay.AWXRep1.UpdateFiltersInfo
```

The above example will change the filter to filter on column “[Tag]”.

DataType

Type: Short

Description

Gets the data type of the column selected in the filter.

Example

```
Dim filter As ofilterwrapper
Set filter = ThisDisplay.AWXRep1.GetFilter(1)
Msgbox filter.DataType
```

The above example will display the data type of the column selected in the filter.

FilterType

Type: Short

Description

Sets/Gets the type of the filter. Can be one of the following:

0 – Inclusive Filter

1 – Exclusive Filter

2 – Custom Filter

Example

```
Dim filter As ofilterwrapper
Set filter = ThisDisplay.AWXRep1.GetFilter(1)
filter.FilterType = 0
ThisDisplay.AWXRep1.UpdateFiltersInfo
```

The above example will set the filter type as an Inclusive Filter.

IncludedValues

Type: VARIANT

Description

Sets/Gets the column values included by the filter.

Example

```
Dim myfilter As ofilterwrapper
Set myfilter = ThisDisplay.AWXRep1.GetFilter(1)
Dim included As String
Dim varstring
Dim myvar As Variant
included = ""
myvar = myfilter.IncludedValues
For Each varstring In myvar
    included = included & CStr(varstring) & "; "
Next varstring
Msgbox included
```

The above example will display a list of the included values separated by semicolons.

ExcludedValues

Type: VARIANT

Description

Set/Get the column values excluded by the filter.

Example

```
Dim myfilter As ofilterwrapper
Set myfilter = ThisDisplay.AWXRep1.GetFilter(1)
Dim excluded As String
Dim varstring
Dim myvar As Variant
```

```
excluded = ""
myvar = myfilter.ExcludedValues
For Each varstring In myvar
    excluded = excluded & CStr(varstring) & "; "
Next varstring
Msgbox excluded
```

The above example will display a list of the included values separated by semicolons.

TimeMode

Type: Short

Description

Set/Get the date/time type for inclusive or exclusive filters. Can be one of the following:

0 – Today

1 – Single Day

2 – Date Range

3 – Last

Example

```
Dim filter As ofilterwrapper
Set filter = ThisDisplay.AWXRep1.GetFilter(1)
Filter.TimeMode = 2
ThisDisplay.AWXRep1.UpdateFiltersInfo
```

The above example will set date/time to “single day”.

Days

Type: Short

Description

Sets/Gets the last x Days value for Date/Time filters

Example

```
Dim filter As ofilterwrapper
Set filter = ThisDisplay.AWXRep1.GetFilter(1)
Filter.Days = 1
```

The above example will set the filter to show the last 1 day.

Hours

Type: Short

Description

Sets/Gets the last x Hours value for Date/Time filters

Example

```
Dim filter As ofilterwrapper
Set filter = ThisDisplay.AWXRep1.GetFilter(1)
Filter.Hours = 1
```

The above example will set the filter to show the last 1 hour.

Minutes

Type: Short

Description

Sets/Gets the last x Minutes value for Date/Time filters

Example

```
Dim filter As ofilterwrapper
Set filter = ThisDisplay.AWXRep1.GetFilter(1)
Filter.Minutes = 1
```

The above example will set the filter to show the last 1 minute.

DateTimeFrom

Type: Variant

Description

Sets/Gets the Time From setting for filters that are set for Date Range. This setting is also used to determine which day is selected for Single Day filters.

Example

```
Dim filter As ofilterwrapper
Set filter = ThisDisplay.AWXRep1.GetFilter(1)
Filter.DateTimeFrom = “7/27/2003 12:00:00 AM”
Filter.DateTimeTo = “7/28/2003 12:00:00 AM”
```

The above example will set the filter to show any message occurring on 7/27/2003.

DateTimeTo

Type: Variant

Description

Sets/Gets the Time To setting for filters that are set for Date Range.

Example

```
Dim filter As ofilterwrapper
Set filter = ThisDisplay.AWXRep1.GetFilter(1)
Filter.DateTimeFrom = “7/27/2003 12:00:00 AM”
Filter.DateTimeTo = “7/28/2003 12:00:00 AM”
```

The above example will set the filter to show any message occurring on 7/27/2003.

CustomSQL

Type: BSTR

Description

Sets/Gets the custom SQL string that is used when the Filter Type is a Custom Filter.

Example

```
Dim filter As ofilterwrapper
Set filter = ThisDisplay.AWXRep1.GetFilter(1)
Filter.CustomSQL = “[Tag]
IN('Humidity','Pump1','Tank1')”
```

The above example will set the custom SQL to select messages with where the Tag field is ‘Humidity’, ‘Pump1’, or ‘Tank1’.

OFilterWrapper methods:

GetSQL() as BSTR

Type: BSTR

Description

Returns the custom SQL string that is used when the Filter Type is a Custom Filter. The returned string is enclosed in parenthesis.

Example

```
Dim filter As ofilterwrapper
Set filter = ThisDisplay.AWXRep1.GetFilter(1)
MsgBox filter.CustomSQL
```

The above example will return the Custom SQL string.

IsValid() as Boolean

Type: BSTR

Description

Returns whether or not the filter is valid.

Example

```
Dim filter As ofilterwrapper
Set filter = ThisDisplay.AWXRep1.GetFilter(1)
If filter.IsValid Then
    MsgBox “This filter is valid.”
Else
    MsgBox “This filter is invalid.”
End If
```

The above example will say let you know if the filter is valid.

OSortEntryWrapper properties:

ColumnName

Type: BSTR

Description

Sets/Gets the column name to sort on.

Example

```
Dim sort As OSortEntryWrapper
Set sort = ThisDisplay.AWXRep1.GetSortEntry(1)
sort.ColumnName = "[Tag]"
ThisDisplay.AWXRep1.UpdateSortInfo
```

The above example sets the sort column as [Tag].

SortDir

Type: Short

Description

Sets/Gets sort direction. Possible values are:

0 – Do not sort on this field

1 – Sort Ascending

2 – Sort Descending

Example

```
Dim sort As OSortEntryWrapper
Set sort = ThisDisplay.AWXRep1.GetSortEntry(1)
Sort.sortdir = 1
ThisDisplay.AWXRep1.UpdateSortInfo
```

The above example sets the sort direction as ascending.

ResortMode

Type: Short

Description

Sets/Gets the re-sort settings. Possible values are:

0 – Do not re-sort after translating

1 – Re-sort after translating

Example

```
Dim sort As OSortEntryWrapper
Set sort = ThisDisplay.AWXRep1.GetSortEntry(1)
Sort.ResortMode = 1
ThisDisplay.AWXRep1.UpdateSortInfo
```

The above example sets the sort entry to re-sort after translating

OAutoPrintSupport properties:

EnableAutoPrint

Type: Boolean

Description

Enables/Disables auto printing of Alarm Report

Example

```
Dim autoprint As OAutoPrintSupport
Set autoprint =
ThisDisplay.AWXRep1.GetAutoPrintSupport()
autoprint.EnableAutoPrint = True
```

The above example enables auto print support.

AutoPrintMode

Type: Short

Description

Gets/Sets the printing mode. Possible values are:

0 – Default printer

1 – Selected Devices

Example

```
    Dim autoprint As OAutoPrintSupport
    Set autoprint =
ThisDisplay.AWXRep1.GetAutoPrintSupport()
    autoprint.AutoPrintMode = 0
```

The above example selects default printer as the printing mode.

Orientation

Type: Short

Description

Gets/Sets the printer orientation. Possible values are:

0 – Portrait

1 – Landscape

Example

```
    Dim autoprint As OAutoPrintSupport
    Set autoprint =
ThisDisplay.AWXRep1.GetAutoPrintSupport()
    autoprint.Orientation = 0
```

The above example selects portrait as the orientation.

NumberOfCopies

Type: Short

Description

Gets/Sets the number of copies to be printed.

Example

```
    Dim autoprint As OAutoPrintSupport
    Set autoprint =
ThisDisplay.AWXRep1.GetAutoPrintSupport()
    Autoprint.NumberofCopies = 5
```

The above example sets the number of copies to 5.

PrintContent

Type: Short

Description

Gets/Sets content of the pages to be printed. Possible values are:

0 - None

1 – Crystal Report – Design #5

2 – Crystal Report – Design #4

4 – Crystal Report – Design #3

8 – Detailed Alarm Report

16 – Condensed Alarm Report

32 – Current Grid / Chart View

* To include multiple choices in auto-printing just add the values together. For example, 63 = all report views.

Example

```
    Dim autoprint As OAutoPrintSupport
    Set autoprint =
ThisDisplay.AWXRep1.GetAutoPrintSupport()
    autoprint.PrintContent = 63
```

The above example sets all pages to be printed.

SpecialPrinter1

Type: IOSpecialPrinter*

Description

Gets/Sets settings for an additional printer.

Example

```
    Dim autoprint As OAutoPrintSupport
    Set autoprint =
ThisDisplay.AWXRep1.GetAutoPrintSupport()
    Dim specprint As OSpecialPrinter
    Set specprint = autoprint.SpecialPrinter1()
    specprint.Orientation = 0
```

The above example sets the orientation of the additional printer as portrait.

IOSpecialPrinter* SpecialPrinter2

Type: IOSpecialPrinter*

Description

Gets/Sets settings for an additional printer.

Example

See Example for SpecialPrinter1

IOSpecialPrinter* SpecialPrinter3

Type: IOSpecialPrinter*

Description

Gets/Sets settings for an additional printer.

Example

See Example for SpecialPrinter1

IOSpecialPrinter* SpecialPrinter4

Type: IOSpecialPrinter*

Description

Gets/Sets settings for an additional printer.

Example

See Example for SpecialPrinter1

IOSpecialPrinter* SpecialPrinter5

Type: IOSpecialPrinter*

Description

Gets/Sets settings for an additional printer.

Example

See Example for SpecialPrinter1

OSpecialPrinter properties:

DriverName

Type: BSTR

Description

Gets/Sets the driver name for the printer.

Example

```
Dim specprint As OSpecialPrinter
Msgbox specprint.DriverName
```

This example displays the name of the driver.

DeviceName

Type: BSTR

Description

Gets/Sets the device name for the printer.

Example

```
Dim specprint As OSpecialPrinter
Msgbox specprint.DeviceName
```

This example displays the name of the device.

PortName

Type: BSTR

Description

Gets/Sets the port name.

Example

```
Dim specprint As OSpecialPrinter
Msgbox Specprint.PortName
```

This example displays the name of the port.

NumberOfCopies

Type: short

Description

Gets/Sets the number of copies to print.

Example

```
Dim specprint As OSpecialPrinter
specprint.NumberOfCopies = 5
```

Orientation

Type: short

Description

Gets/Sets the orientation for printing

Example

```
Dim specprint As OSpecialPrinter
specprint.Orientation = 0
```

This example sets the orientation as portrait.

OCRLine properties:

long Style

long PenWidth

OLE_COLOR Color

OCRText properties:

BSTR Text

IFontDisp* Font;

short FontPointSize

OLE_COLOR ForeColor

OLE_COLOR BackColor

OLE_COLOR BorderColor

short Justify

short Left

short Width

short Top

short Height

bool DropShadow

long LeftBorder

long TopBorder

long RightBorder

long BottomBorder

OCRField properties:

BSTR Field

BSTR HeaderText

short Width

OCRTemplate properties:

OLE_COLOR DataColor

IFontDisp* HeaderFont

short HeaderFontPointSize

IFontDisp* DataFont

short DataFontPointSize

OLE_COLOR HeaderColor

IOCRText* MainTitle

IOCRText* SubTitle

IOCRLine* HeaderDivider

IOCRLine* DataRowDivider

short XtraHeaderSpace

short XtraDataSpace

BSTR TemplateName

float BottomMargin

float TopMargin

float LeftMargin

float RightMargin

short PaperType

short ReportingMode

boolean HasUpperLimit

long UpperLimit

boolean AttachCurrTableName

short Orientation

short SortingMode

OCRTemplate methods:

GetFieldsCount() as Short

AddField(BSTR NewFieldName, BSTR NewFieldHeaderText, short NewFieldWidth) as IOCRField

DeleteField(short FieldIndex)

SwitchFields(short FieldIndex1, short FieldIndex2)

GetFieldObject(short FieldIndex) as IOCRField

GetFiltersNumber() as Short

GetSortEntriesNumber() as Short

GetFilter(short iIndex) as IOFilterWrapper

AddFilter(BSTR newCol) as IOFilterWrapper

DeleteFilter(short iIndex)

GetSortEntry(short iIndex) as IOSortEntryWrapper

AddSortEntry(BSTR newCol) as IOSortEntryWrapper

DeleteSortEntry(short iIndex)

SwitchSortEntries(short iIndex1, short iIndex2)

Chapter 5

Server Configurator

Introduction

The AlarmWorX Server receives field data from any OPC-compliant Data Access server and performs alarm detection and reporting based on the OPC Alarm and Events Standard. The event notifications generated by the AlarmWorX Server are sent to any OPC Alarm and Event clients that subscribe. The AlarmWorX Viewer and the AlarmWorX Logger are two examples of clients that can receive these notifications from the server.

The server supports the following alarm types:

- **Limit:** High High, High, Low, Low Low
- **Deviation:** High High, High, Low, Low Low
- **Rate of Change**
- **Digital**

The Server Application (AwxSvr.exe) has no user interface and may optionally be run as a service on Windows NT. The server reads its configuration information from a Microsoft Access Database file, which by default is **AwxSvr.mdb** located in the same directory as the server application. During runtime the server will poll the configuration database for changes, so configuration may be done on the fly without stopping the server.

The Server Configurator Application (AwxServerConfigurator.exe) is used to make changes to the Microsoft Access Database file that the server uses for configuration information.

Installation

The following are the major files that comprise the server component of AlarmWorX:

AwxSvr.exe	Server application/service
AwxServerConfigurator.exe	Server Configurator
AwxSvr.mdb	Server configuration database

The files are installed in the Bin directory chosen during the installation. A program icon is installed for Configurator in the AlarmWorX program group.

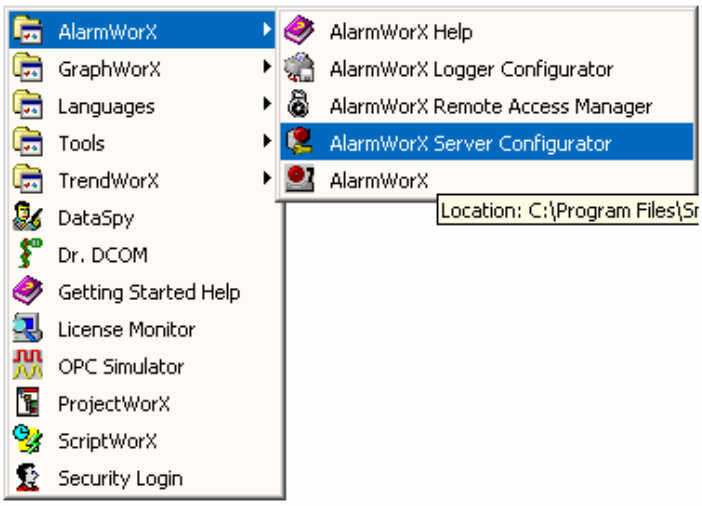
By default the Server (AwxSvr.exe) is registered as a normal application, but can be registered to run as a service under Windows NT. Running as a Service has the following advantages:

- The Server can be set to start as soon as the machine is powered (before a user has logged on).
- The Server will remain running even if a user Logs off of NT.

To register the Server as a Windows NT Service:

1. Run the **ProcessView Tray** utility from the Windows **Start** menu by selecting **Programs > Smar PROCESSVIEW > Tools >** the **ProcessView Tray.**

2. This opens ProcessView Tray and puts the the **ProcessView Tray** icon in the taskbar system tray. Click the the **ProcessView Tray** icon in the system tray and select **AlarmWorX > Sever > NT Service,** as shown in the figure below. To have the service start automatically upon system startup, click the the **ProcessView Tray** icon in the system tray and select **AlarmWorX > Sever > Auto Start.**



Running AlarmWorX Server From ProcessView Tray

The **ProcessView Tray** utility can also be used to manually start and stop the server.

Note: The Alarm Server does not use standard COM rules for activation/deactivation. If the server is started for any reason (via ProcessView Tray or by activation by an OPC Alarm Client), it will remain running until both of the following conditions are met:

The ProcessView Tray utility has issued the **Stop** command to the Server.

All OPC alarm clients have disconnected from the server.

Since NT Services are not supported in Windows 95 and Windows 98, ProcessView Tray can be used to facilitate the starting of the Alarm Server on startup:

3. Place a shortcut to the **ProcessView Tray** utility in the startup group so **ProcessView Tray** will start automatically when Windows 95 or Windows 98 boots up.

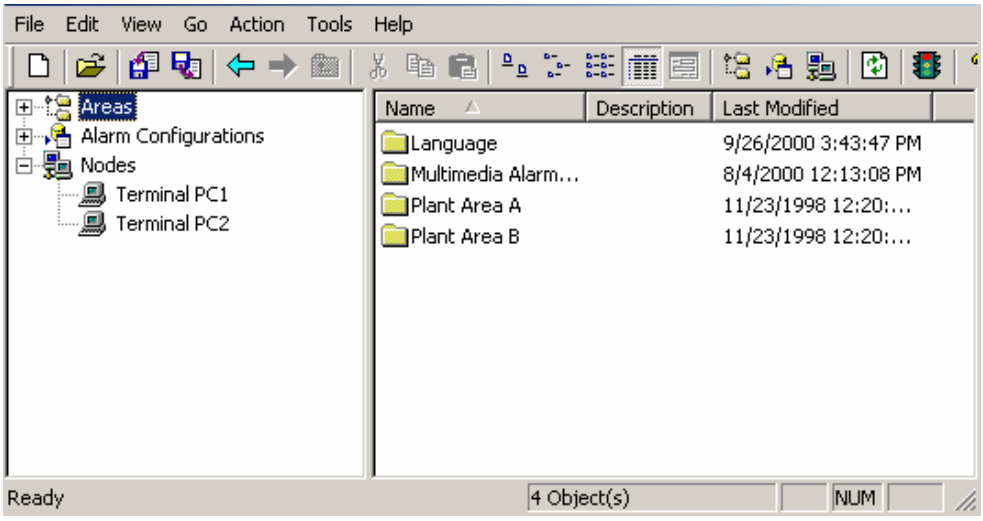
4. To have the Alarm Server start automatically when ProcViewTray starts, click the **ProcessView Tray** icon in the system tray and select **AlarmWorX > Sever > Auto Start.**

Starting the Alarm Server Configuration

AlarmWorX Server Configurator is an application used to create and maintain an alarm tag database for use by the AlarmWorX Server. In addition to simple tag configuration, the configurator is used to create and maintain a process area hierarchy and to group tags into one or more named "configurations" to support servers running on multiple network nodes.

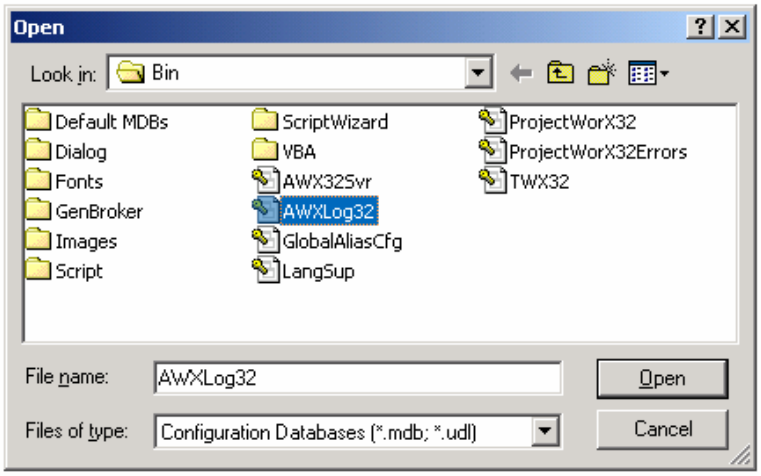
To launch the AlarmWorX Server Configurator from the Windows **Start** menu:

- Select **Programs > SMAR PROCESSVIEW > AlarmWorX > Alarm Server Configurator.**
- The **Awx32Svr.mdb** Microsoft Access database file opens in the Alarm Server Configurator, as shown in the figure below. The screen consists of a split window with a tree control view in the left-hand pane and a configuration view in the right-hand pane. The Configurator provides a standard format for the configuration database, as well as a sample (default) configuration project. The Configurator also includes a toolbar and menus with many command functions.



Alarm Server Configurator Screen

1. To open a different database file, select **Open** from the **File** menu. This opens the **Open** dialog box, shown below, which enables you to browse for configuration files.

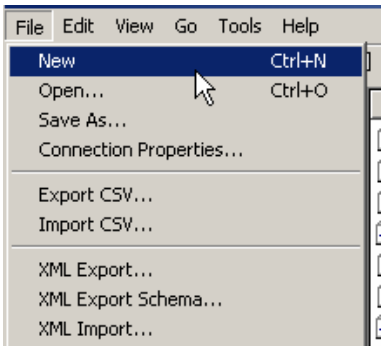


Selecting a Configuration Database

Creating Configuration Databases

The Configurator provides a Configuration Database Wizard for creating new Microsoft Access and SQL Server configuration databases. To create a new configuration database in the Configurator:

- Select **New** from the **File** menu, as shown in the figure below**.**



Creating a Configuration Database

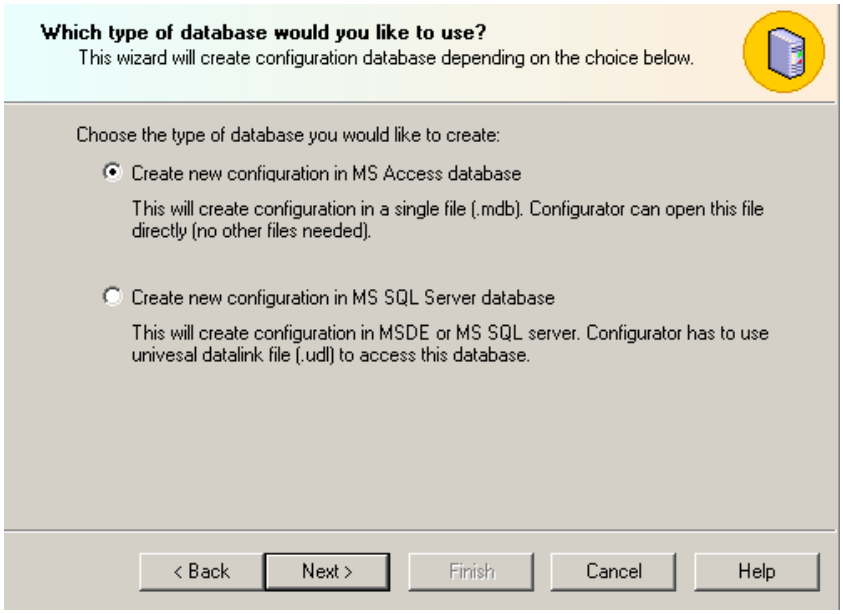
- The introduction screen for the Configuration Database Wizard appears. Click the **Next** button to continue.

- You have two options for creating your new database, as shown in the figure below:

Create a new Microsoft Access configuration database: For a Microsoft Access database, the Configurator uses a single .mdb file

Create a Microsoft SQL Server database: The Configurator uses Universal Data Link (.udl) files to connect to a Microsoft SQL Server or MSDE database.

Select the database type you want to create, and then click **Next.**

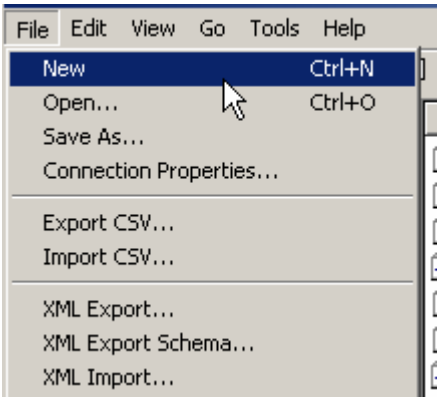


Choosing the Type of Database To Create

Creating a Microsoft Access Configuration Database

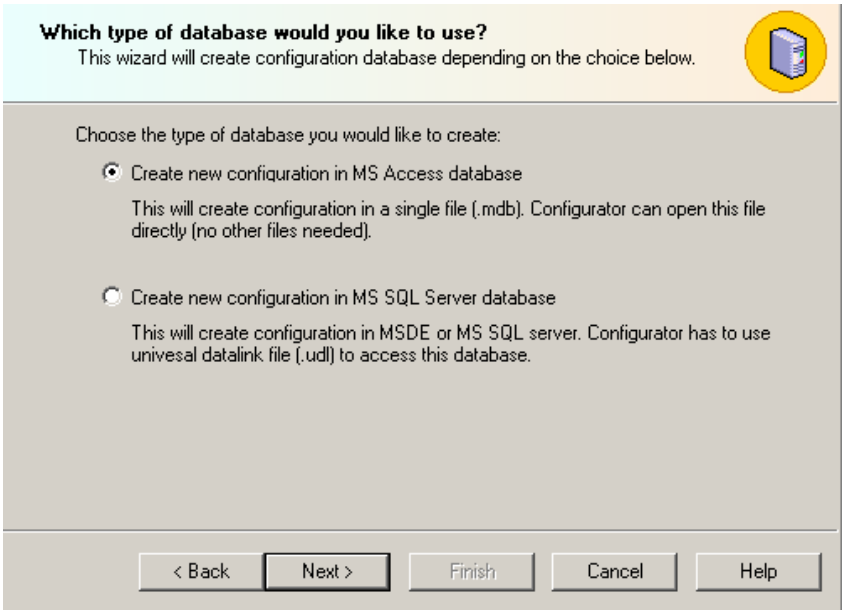
To create a new Microsoft Access configuration database in the Configurator:

1. Select **New** from the **File** menu, as shown in the figure below**.**



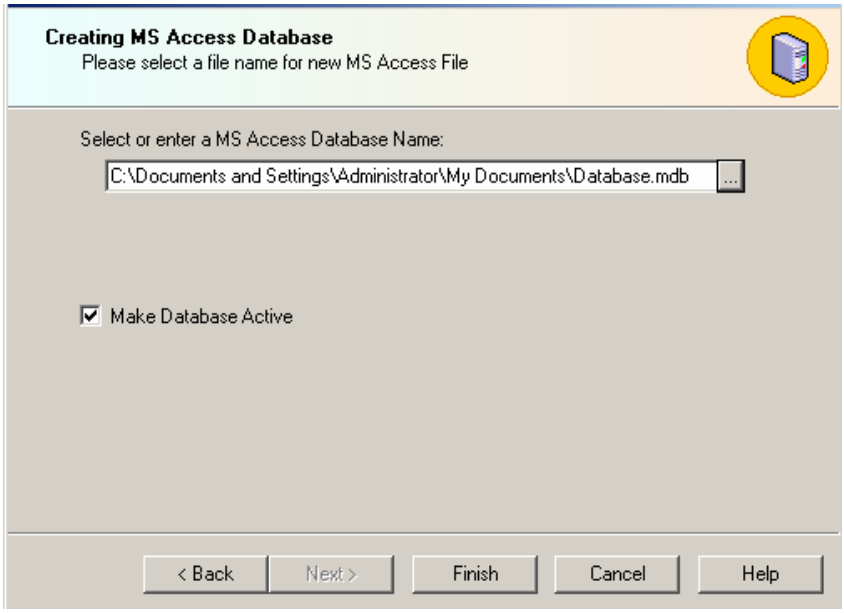
Creating a Configuration Database

- The introduction screen for the Configuration Database Wizard appears. Click the **Next** button to continue.
- You have two options for creating your new database, as shown in the figure below. Select **Create new configuration in MS Access database.** Click the **Next** button to continue.



Creating a New Microsoft Access Database

- Specify the directory path and file name for the new database, as shown in the figure below. Click the **...** button to browse for a directory. If you want this new database to be the active configuration database, check **Make Database Active.**



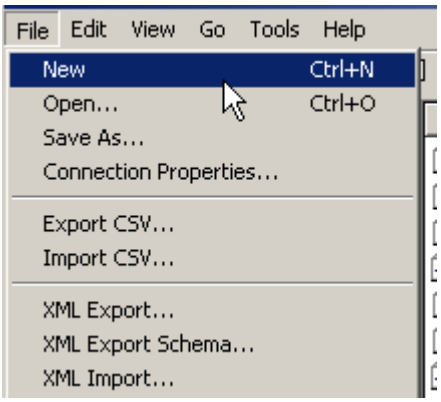
Naming the New Access Database

- Click the **Finish** button. The new database is created and opened in the Configurator.

Creating a Microsoft SQL Server Configuration Database

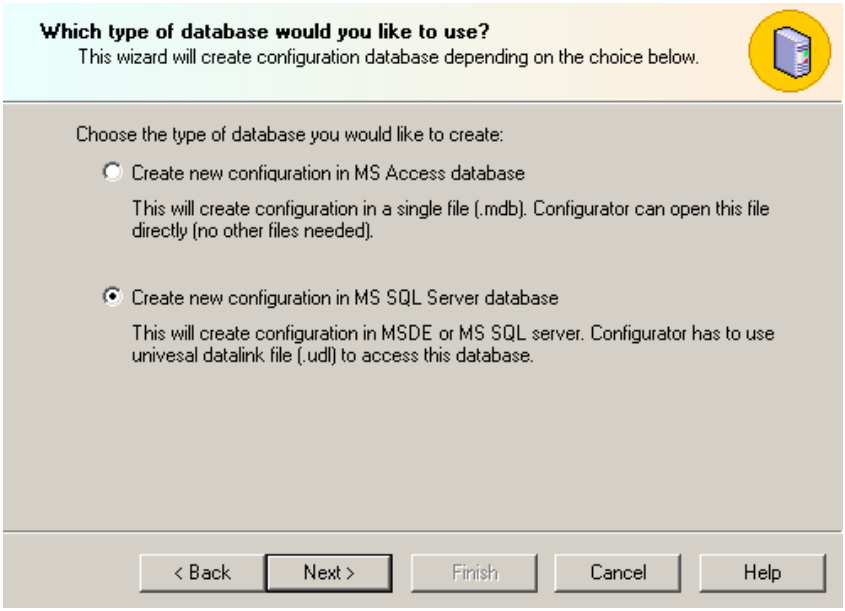
To create a new Microsoft SQL Server configuration database in the Configurator:

1. Select **New** from the **File** menu, as shown in the figure below**.**



Creating a Configuration Database

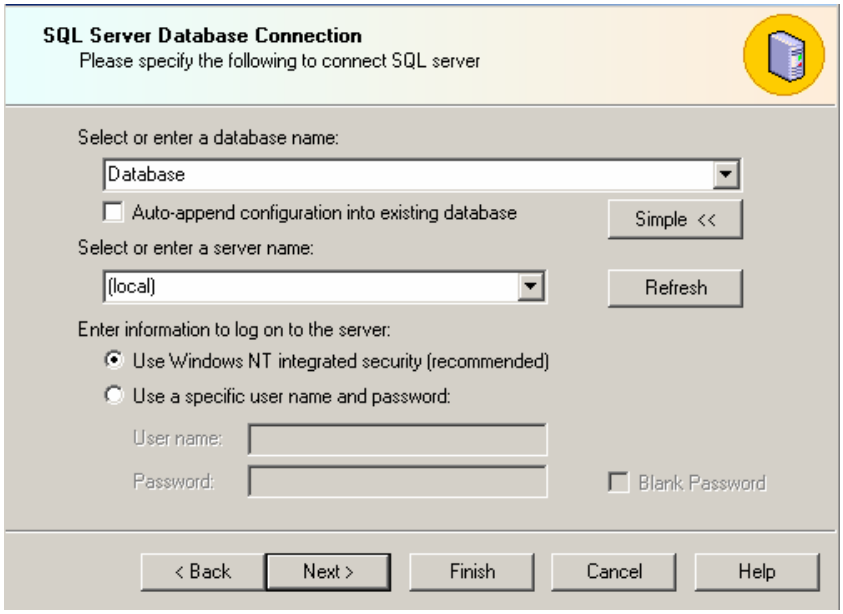
- The introduction screen for the Configuration Database Wizard appears. Click the **Next** button to continue.
- You have two options for creating your new database, as shown in the figure below. Select **Create new configuration in MS SQL Server database.** Click the **Next** button to continue.



Creating a New Microsoft SQL Server Database

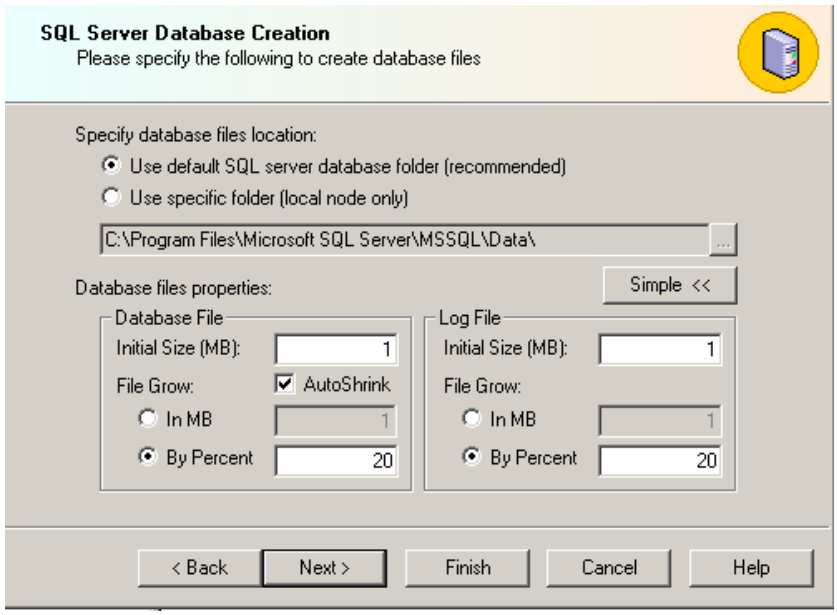
- To connect to a SQL Server database, either select an existing database from the **Database Name** drop-down list, or a type a new name to create a new database, as shown in the figure below. If you choose to use an existing database, you have the option of adding (auto-appending) the configuration to the existing database. (For more information about the auto-append function, please see "Adding the Configuration to an Existing Database.")
- In the **SQL Server Name** field, select the local SQL Server on which to create the database. If necessary, enter a user name and password to log on to the SQL Server. (It is recommended that you use Windows NT integrated security.)
- **Note:** Usually you have only one instance of SQL Server running on the local node. In this case, the drop-down list under **SQL Server Name** has only one option: "(local)." However, it is possible to run multiple SQL Server instances on the local node, in which case the **SQL Server** field lists all those SQL Server instances: "(local)" for the default instance and

"node_name/instance_name" for all others. The drop-down list may show SQL Server instances on other nodes as well.



Connecting to a SQL Server Database

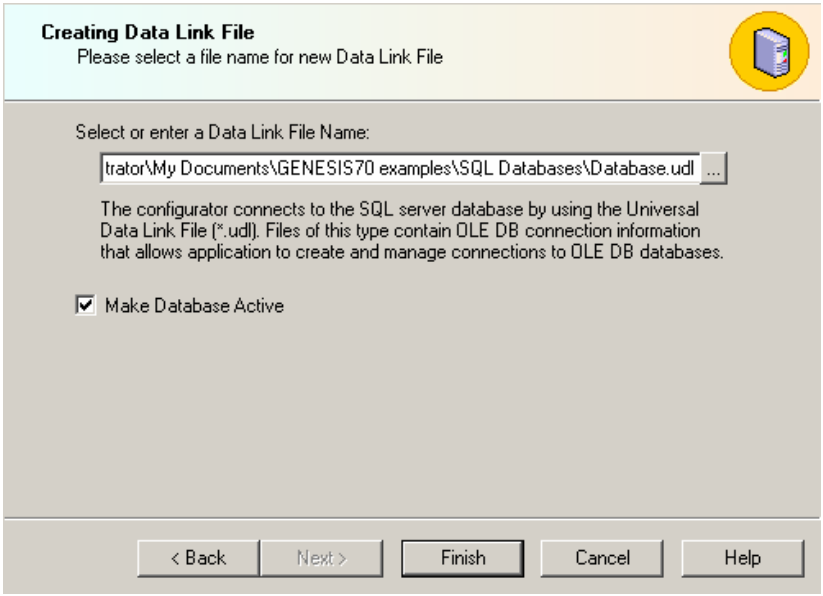
- Specify a directory path location in which to create the database, as shown in the figure below. You can either use the default SQL Server database folder, or you can click the **...** button and browse for a specific folder.



Specifying the Database Location and Properties

- Under the **Database Properties** section, specify an initial size for the database, which should be as large as possible. You can also specify a **Database Growth** option (in megabytes) or as a percentage of the total size. MSDE servers are capable of growing the database on the fly to store more data. However, if this operation is performed frequently, the overall system performance may decrease. Choosing an initially large database size and a corresponding database growth option can drastically improve system performance.
- Under the **Log File Properties** section, you can also modify the settings for the database transaction log file. Specify a **Log File Growth** option (in megabytes) or as a percentage of the total size. Again, a sufficient initial size setting can greatly improve performance. The default options should be adequate for most applications with a small to medium size load.

- Click the **Next** button to create the new SQL Server database.
- The Configurator uses Universal Data Link (.udl) files to connect to the Microsoft SQL Server database. These .udl files contain OLE database connection information that allows the Configurator to create and manage connections to OLE databases. Enter a name and directory path for the new .udl file in the **Data Link File Name** field, as shown in the figure below. You can browse for a directory by clicking the **…** button to the right of this field. Click the **Next** button to continue. If you want this new database to be the active configuration database, check **Make Database Active.**



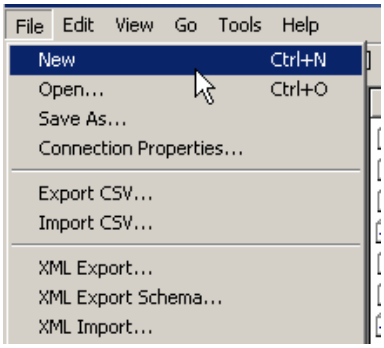
Creating a Universal Data Link File

- Click the **Finish** button. The new database is created and opened in the Configurator.

Adding a Configuration Database to an Existing SQL Server Database

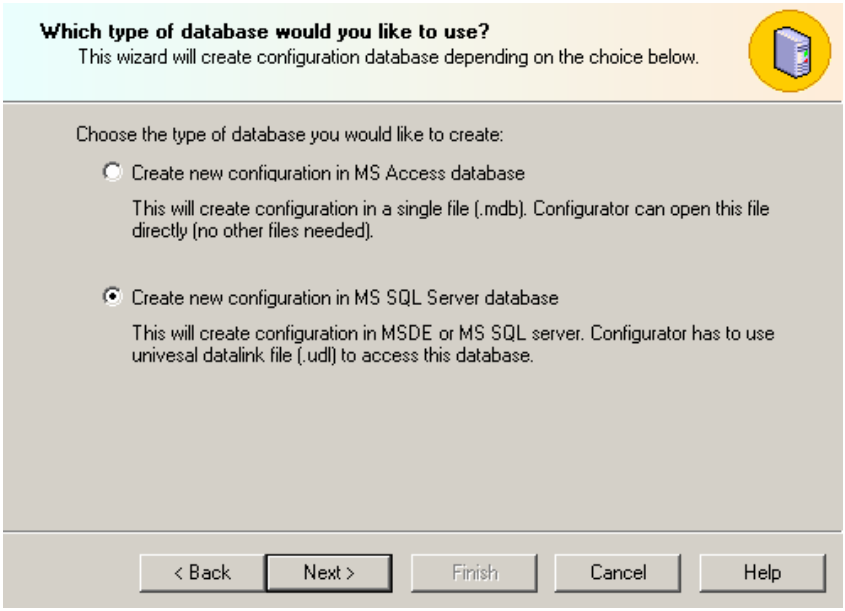
The Configuration Database Wizard also gives you the option to add the configuration database structure to an existing Microsoft SQL Server database:

1. Select **New** from the **File** menu, as shown in the figure below.



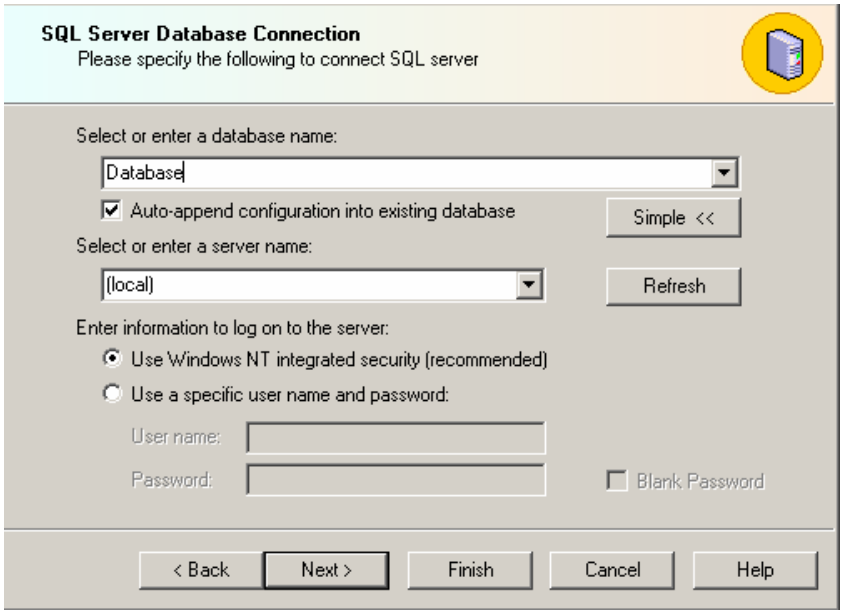
Creating a Configuration Database

- The introduction screen for the Configuration Database Wizard appears. Click the **Next** button to continue.
- You have two options for creating your new database, as shown in the figure below. Select **Create new configuration in MS SQL Server database.** Click the **Next** button to continue.



Creating a Microsoft SQL Server Database

- To connect to a SQL Server database, select the existing database from the drop-down list, as shown in the figure below. Check the **Auto-append configuration into existing database** check box. In the **SQL Server** field, select the local SQL Server on which to create the database. Type a name for the database in the **Database Name** field. If necessary, enter a user name and password to log on to the SQL Server. (**Note:** It is recommended that you use Windows NT integrated security.) Click the **Next** button to continue.
- **Note:** Usually you have only one instance of SQL Server running on the local node. In this case, the drop-down list under **SQL Server Name** has only one option: "(local)." However, it is possible to run multiple SQL Server instances on the local node, in which case the **SQL Server** field lists all those SQL Server instances: "(local)" for the default instance and "node_name/instance_name" for all others. The drop-down list may show SQL Server instances on other nodes as well.



Connecting to an Existing SQL Server Database

- If the existing database already has configuration tables, you have the following options, as shown in the figure below:

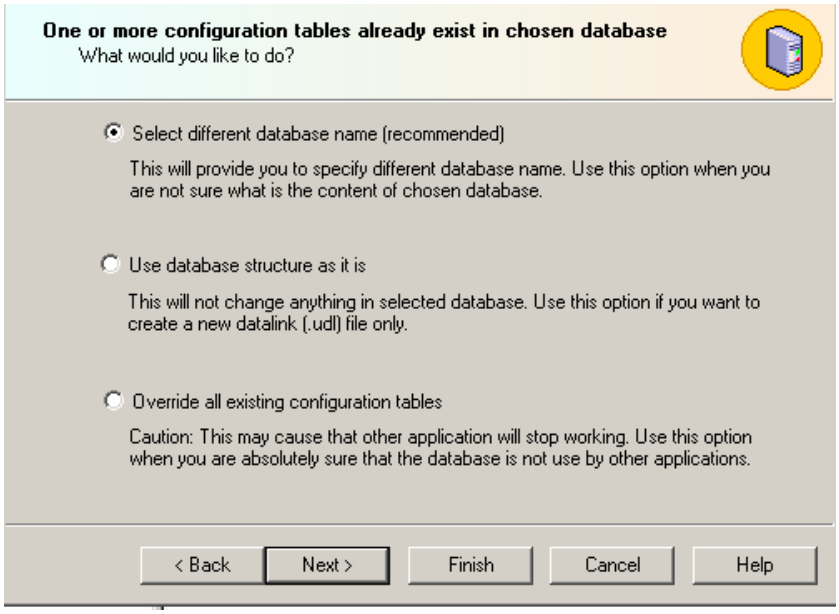
Select a different database name (recommended): This option allows you to rename the database without affecting the existing database as well as create a new Data Link (.udl) file.

Use the existing database structure: This option preserves the content of the existing database and allows you to create a new Universal Data Link (.udl) file.

Override all existing configuration tables: This option expunges the content of the existing database and allows you to create a new Universal Data Link (.udl) file.

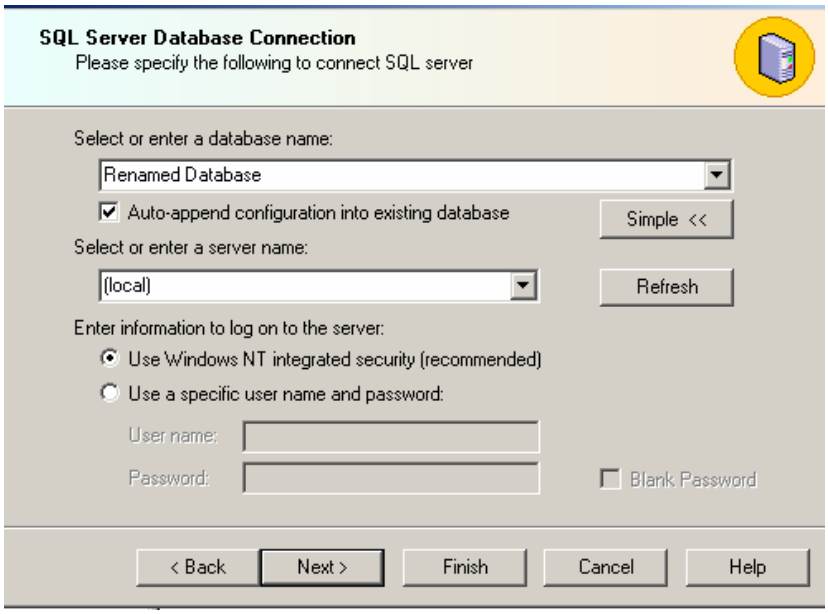
Note: Overriding the database may disable other applications that also use the database.

Click the **Next** button to continue.



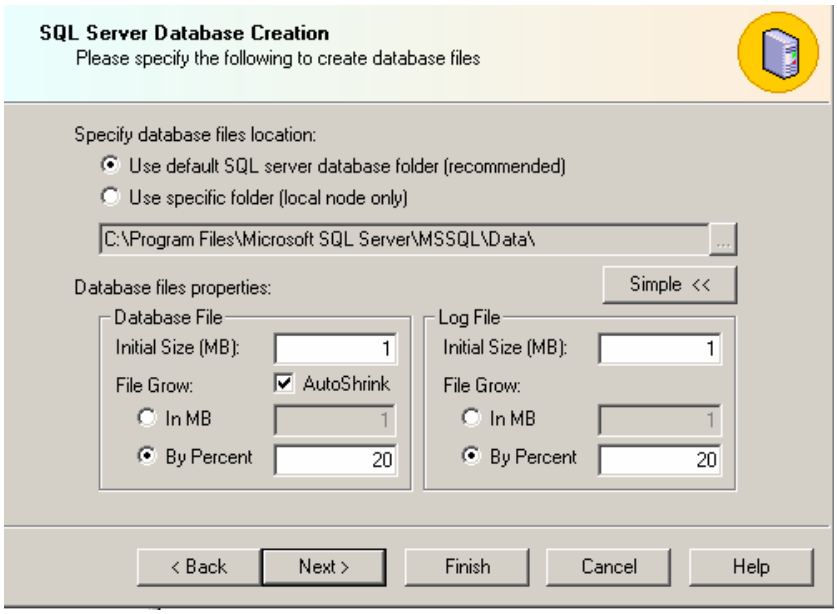
Adding the Configuration to an Existing SQL Server Database

- If you chose **Select a different database name (recommended),** you are directed back to the SQL Server Database Connection dialog box, as shown in the figure below. Enter a new name for the database, and then click **Next.**



Renaming the Existing SQL Server Database

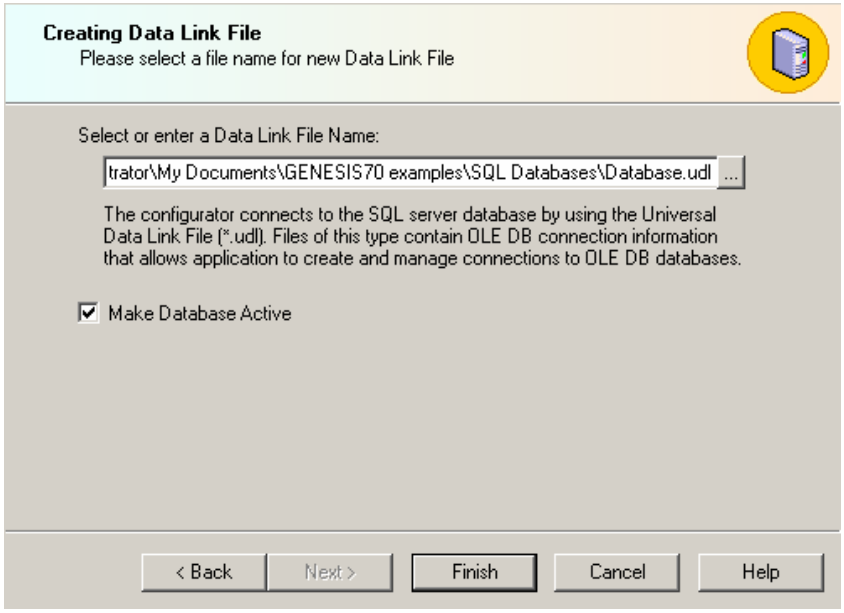
- Specify a directory path location in which to create the database, as shown in the figure below. You can either use the default SQL Server database folder, or you can click the **...** button and browse for a specific folder.



Specifying the Database Location and Properties

- Under the **Database Properties** section, specify an initial size for the database, which should be as large as possible. You can also specify a **Database Growth** option (in megabytes) or as a percentage of the total size. MSDE servers are capable of growing the database on the fly to store more data. However, if this operation is performed frequently, the overall system performance may decrease. Choosing an initially large database size and a corresponding database growth option can drastically improve system performance.
- Under the **Log File Properties** section, you can also modify the settings for the database transaction log file. Specify a **Log File Growth** option (in megabytes) or as a percentage of the total size. Again, a sufficient initial size setting can greatly improve performance. The default options should be adequate for most applications with a small to medium size load.
- Click the **Next** button to create the new SQL Server database.
- The Configurator uses Universal Data Link (.udl) files to connect to the Microsoft SQL Server database. These .udl files contain OLE database connection information that allows the Configurator to create and manage connections to OLE databases. Enter a name and directory path for the new .udl file in the **Data Link File Name** field, as shown in the figure below. You can browse for a directory by clicking the **...** button to the right of this field. Click the **Next** button to continue. If you want this new database to be the active configuration database, check **Make Database Active.**

Note: If you chose to **Use the existing database structure** or to **Override all existing configuration tables,** you will still need to create a new Data Link file.



Creating a Universal Data Link File

- Click the **Finish** button. The new database is created and opened in the Configurator.

Toolbars

The Alarm Server Configurator contains two toolbars: a **Standard** toolbar and a **Data Manipulation** toolbar.

Standard Toolbar

To show or hide the **Standard** toolbar, select **Toolbars > Standard Buttons** from the **View** menu. The **Standard** toolbar, shown below, contains the following command buttons.

New: Creates a new configuration database.

Open: Opens an existing configuration database.

Export Data: Exports configuration data to a text file (.txt) or a Microsoft Excel file (.csv).

Import Data: Imports configuration data from a text file (.txt) or a Microsoft Excel file (.csv).

Back: Moves the cursor back to the previously selected item in the tree control.

Next: Moves the cursor to the next item in the tree control.

Up One Level: Moves up one level in the tree control.

Cut: Deletes current selection, sending it to the clipboard.

Copy: Copies the current selection to the clipboard.

Paste: Pastes the current contents of the clipboard.

Large Icons: Displays items as large icons.

Small Icons: Displays items as small icons.

List: Displays items as a list.

Details: Displays items as a list with details.

Dialog View: Displays additional configuration options.

Areas: Moves the cursor to the **Areas** tree control.

Configurations: Moves the cursor to the **Alarm Configurations** tree control.

Nodes: Moves the cursor to the **Nodes** tree control.

Global Refresh: Refreshes the data for the entire Configurator screen.

Start/Stop Server: Toggles Alarm Server runtime mode.

About: Displays information about the application.

Help: Displays context-sensitive help.

Help Topics: Launches online Help for the application.

Data Manipulation Toolbar

To show or hide the **Data Manipulation** toolbar, select **Toolbars > Data Manipulation Buttons** from the **View** menu. The **Data Manipulation** toolbar, shown below, contains the following command buttons.

New Area: Creates a new area under the **Areas** tree control.

New Link to Tag: Creates a new link to an alarm tag.

New Configuration: Creates a new configuration under the **Alarm Configurations** tree.

New Tag: Creates a new tag for an alarm configuration.

New Node: Creates a new node under the **Nodes** tree control.

Menus

The menu bar of the Alarm Server Configurator contains the following menus:

- File
- Edit
- View
- Go
- Action
- Tools
- Help

Note: You can also access many of the menu commands by right-clicking items in the tree control of the Configurator and selecting command functions from the pop-up menus.

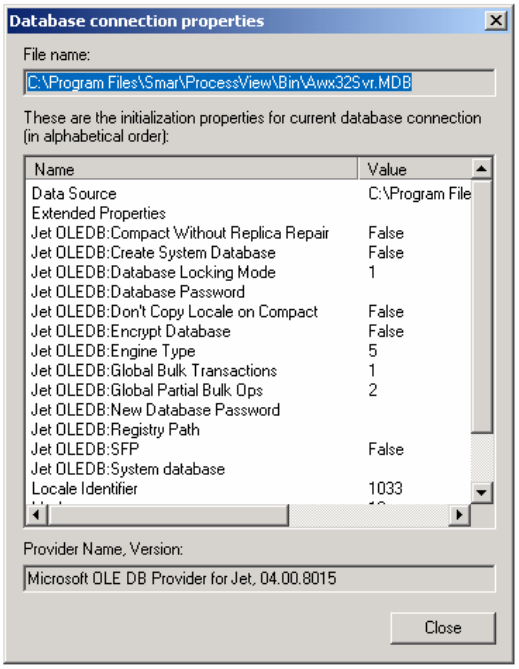
File Menu

The **File** menu of the AlarmWorX Server Configurator contains the following commands:

Command	Shortcut Key	Function
New	CTRL+N	Creates a new configuration database.
Open	CTRL+O	Opens a new .mdb (Microsoft Data Access) or .udl (Microsoft Data Link) file.
Save As		Saves the database under a different name.
Connection Properties		Opens the **Database Connection Properties** dialog box.
CSV Export		Exports data from a selected .csv file.
CSV Import		Imports data from a selected .csv file.
XML Export		Exports configuration data to an XML file.
XML Export Schema		Exports configuration data to an XML Schema file.
XML Import		Imports configuration data from an XML file.
XML Validate		This feature does not import an XML data file, but it will try to validate its structure using stored XML schema. Once it passes this validation, the XML file is acceptable for import by the Configurator.
Make Active		Activates the current configuration database for use by the alarm server.
Exit		Closes the applications and stops data logging if it started within the Configurator.

Database Connection Properties

Selecting **Connection Properties** from the **File** menu opens the **Database Connection Properties** dialog box, shown below, which lists the initialization properties for the current database connection.

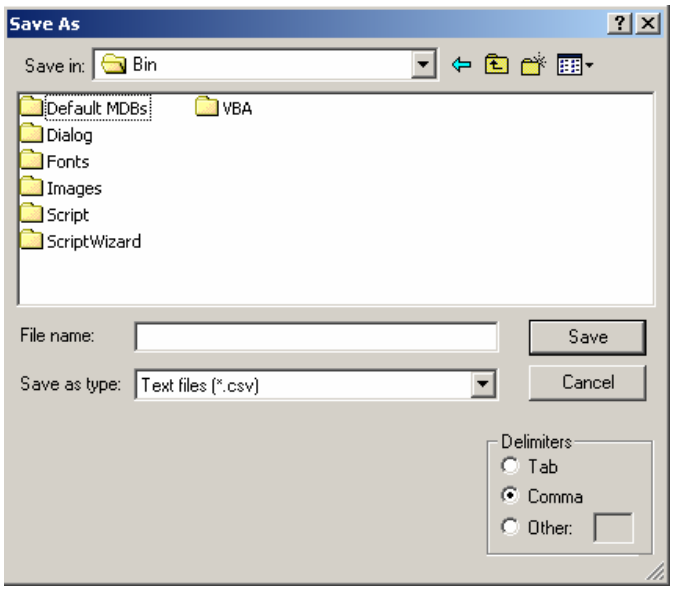


Database Connection Properties Dialog Box

Exporting Configuration Data

Exporting Data to a Text or CSV File

The Configurator offers the flexibility of exporting data from your configuration database to a text (.txt) file or a Microsoft Excel (.csv) file. To export data, select **Export** from the **File** menu. This opens the **Export Configuration Data to File** dialog box, as shown in the figure below. You can then specify the delimiters for exporting the data. Unless you specify delimiters in the **Export Configuration Data to File** dialog box, the file uses **Commas** as delimiters by default. Each group contains headings and columns that provide information about each item, such as descriptions and associated translations and expressions. It also provides the "tree" pathway for each item. Choose the directory to which you want to export the data from your database. In the **Save As Type** field, choose the file type (.txt or .csv) that you would like to save.



Exporting Configuration Data

Exporting Data to an XML File

The Configurator also allows you to export data from your configuration database to an XML file. The XML export/import functionality was mainly developed for Windows platforms that do not support databases (e.g. Windows CE and Windows Embedded). XML has the following advantages over the CSV import/export function:

XML has a standardized format, unlike the text/CSV format, which uses various delimiters (e.g. TAB instead of commas, strings could not accept all characters, etc.)

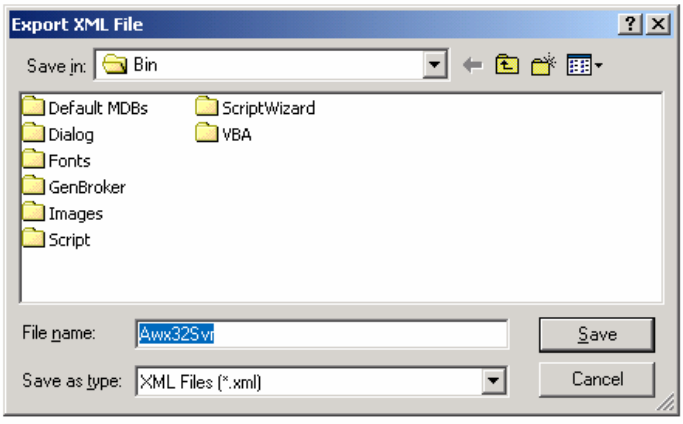
XML is language-independent, whereas CSV converts date/time, floats, and currency fields according to local settings in Windows. For example, using CSV, you cannot export data on German Windows and import it on English windows without making changes

Windows has an installed automation object that has the capability to work with XML. Thus, programmers can create/modify their configurations outside the Configurator using Visual Basic, if desired.

XML supports schemas. A **schema** is a special XML file that specifies the data structure of an XML data file.

To export data, select **XML Export** from the **File** menu. This opens the **Export XML File** dialog box, as shown in the figure below. Give the file a name, and then choose the directory to which you want to export the data from your database. Click **Save.**

Note: You can also export configuration data to an XML Scheme file by selecting **XML Export** from the **File** menu.



Exporting Configuration Data to an XML File

Importing Configuration Data

Importing Data From a Text or CSV File

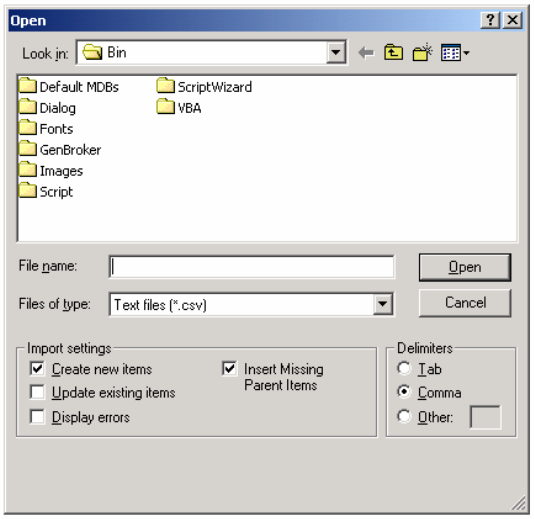
The Configurator offers the flexibility of importing data from a text (.txt) file or a Microsoft Excel (.csv) file to your configuration database. To import data, select **Import CSV** from the **File** menu. This opens the **Import Configuration Data From File** dialog box, shown below. You can then specify the delimiters and choose from the following import settings:

Create new items. When the import file contains items that are not yet in the configuration database, then it creates them. Otherwise it skips these items.

Update existing items. When the import file contains items that are in the configuration database, then it updates them using data from the import file. Otherwise it skips these items.

Note: Either **Create new items** or **Update existing items** must be selected. Otherwise there is nothing to import.

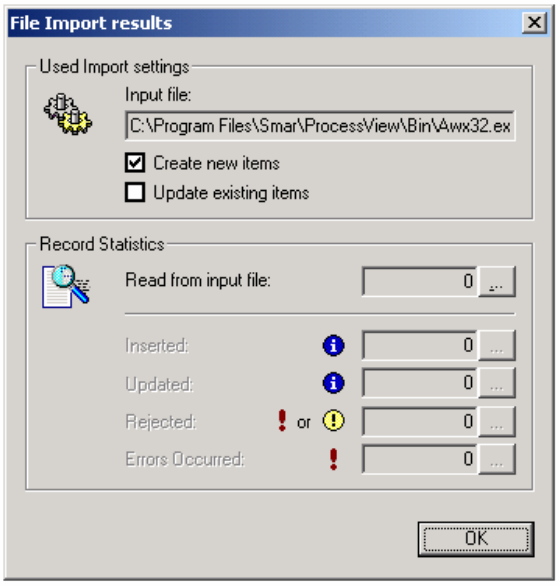
Display errors. When this item is checked, the Configurator shows a dialog box if an error occurs, and then asks you if you want to proceed with the import. When it is not checked, it skips all items where an error occurred.



Importing Configuration Data

When you have selected a file to import, click **Open.** When the import is completed, the **File Import Results** dialog box opens, as shown below. This shows the import settings, including the input file name. It also provides a summary of the import, including how many items were inserted, updated, or rejected, and shows how many errors occurred.

Click the **...** button to the right of each field to get the details view of the import results, as shown below. This view shows the specific items that were inserted, updated, or rejected, as well as a description of any errors that occurred.



File Import Results Dialog Box

Importing Data From an XML File

The Configurator allows you to import data from your configuration database to an XML file. The XML export/import functionality was mainly developed for Windows platforms that do not support databases (e.g. Windows CE and Windows Embedded). XML has the following advantages over the CSV import/export function:

XML has a standardized format, unlike the text/CSV format, which uses various delimiters (e.g. TAB instead of commas, strings could not accept all characters, etc.)

XML is language-independent, whereas CSV converts date/time, floats, and currency fields according to local settings in Windows. For example, using CSV, you cannot export data on German Windows and import it on English windows without making changes

Windows has an installed automation object that has the capability to work with XML. Thus, programmers can create/modify their configurations outside the Configurator using Visual Basic, if desired.

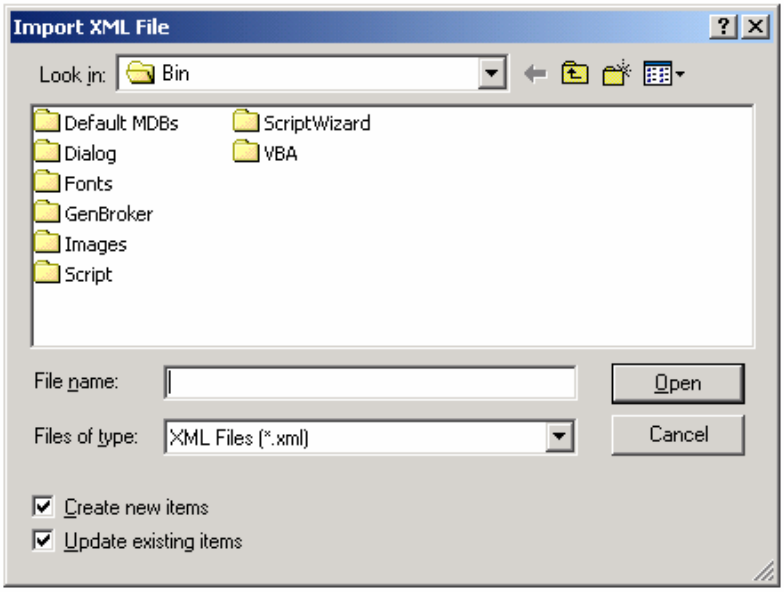
XML supports schemas. A **schema** is a special XML file that specifies the data structure of an XML data file.

To import data, select **XML Import** from the **File** menu. This opens the **Import XML File** dialog box, as shown in the figure below. Give the file a name, and then choose the directory from which you want to import the data. You can then specify the delimiters and choose from the following import settings. Click **Open.**

- Create new items. When the import file contains items that are not yet in the configuration database, then it creates them. Otherwise it skips these items.
- Update existing items. When the import file contains items that are in the configuration database, then it updates them using data from the import file. Otherwise it skips these items.

Note: Either **Create new items** or **Update existing items** must be selected. Otherwise there is nothing to import.

Note: Selecting **XML Validate** from the **File** menu does not import an XML data file, but it will try to validate its structure using stored XML schema. Once it passes this validation, the XML file is acceptable for import by the Configurator.

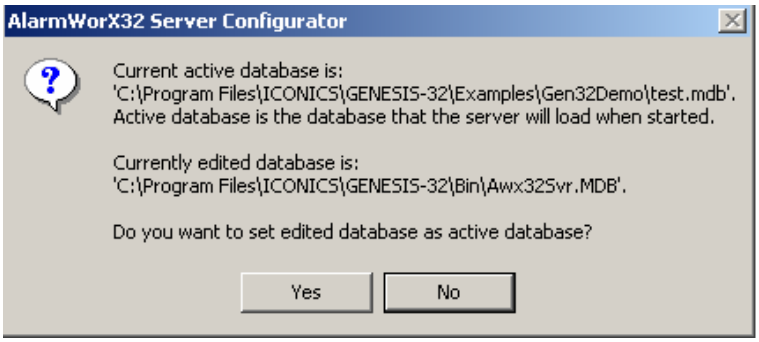


Importing Configuration Data From an XML File

Activating the Database

Once your configuration is complete, you need to make sure that it is the active database. The database that is currently active is the one that the alarm server will use. To make the current database active, select **Make Active** from the **File** menu. If the **Make Active** selection is grayed out, then the current database is already the active database.

A dialog box appears, as shown in the figure below, showing both the current active database and database that is currently being edited, as shown in the figure below. To set the edited database as the active database, click the **Yes** button.



Activating the Database

Edit Menu

The **Edit** menu commands are listed in the table below.

Edit Menu Commands

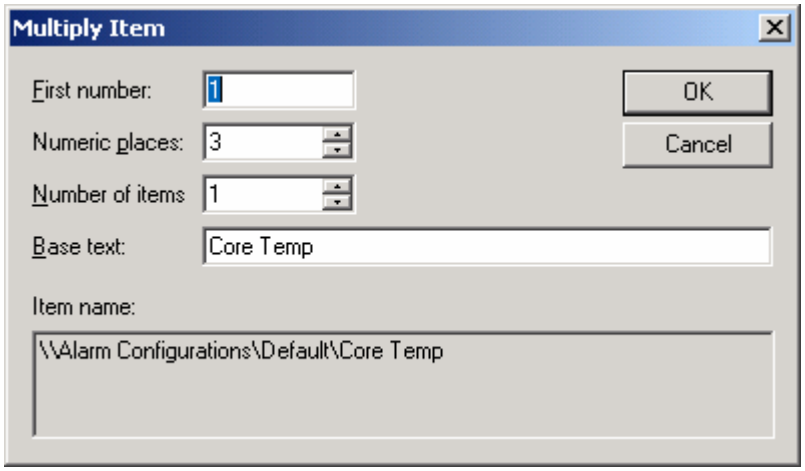
Command	Shortcut Keys	Function
New		Creates a new item depending on what is selected in the tree control.
Rename	CTRL+R	Renames the selected item.
Multiply	CTRL+M	Opens the **Multiply Item** dialog box (see below), which allows you to multiply an item in the tree control.
Delete	CTRL+DEL	Deletes the selected object.
Cut	CTRL+X	Cuts the selected object from the view and places it on the clipboard.
Copy	CTRL+C	Copies the selected object to the clipboard.
Paste	CTRL+V	Pastes the last object placed on the clipboard.
Select All	CTRL+A	Selects all objects in a list. The selection is shown in the upper-right-hand section of the viewer.
Invert Selection		Unselects all selected items and selects all unselected items in a list in the upper-right-hand section of the viewer.

Multiplying Items

The Alarm Server Configurator allows you to multiply items in the tree control. Multiplication provides a simple way of developing configurations where there are many similar items in a given category. To multiply an item:

1. Select the item in the tree control that you wish to multiply.

2. Either right-click the item and select **Multiply** from the pop-up menu, or select **Multiply** from the **Edit** menu. This opens the **Multiply Item** dialog box, shown below**.**



Multiply Item Dialog Box

- When the items are multiplied, they are all given a base name followed by a number. The default base text is the name of the item selected for multiplication. To modify the base text, change the **Base Text** field appropriately.
- In the **First Number** field, specify the number to appear next to the first multiplied item.
- In the **Number of Items** field, specify how many items you wish to create.
- In the **Numeric Places** field, specify the minimum length of each number to append. Values that take up less space than the specified amount of numeric places will have zeros before the number.
- If you want to multiply all subfolders as well, check the **Including Subtree** check box.

- Click the **OK** button to do the multiplication. The example configuration shown in the **Multiply Item** dialog box above creates three new OPC Data folders with the following names:

Core Temp001

Core Temp002

Core Temp003

All subfolders will also be multiplied.

View Menu

The **View** menu commands are listed in the table below.

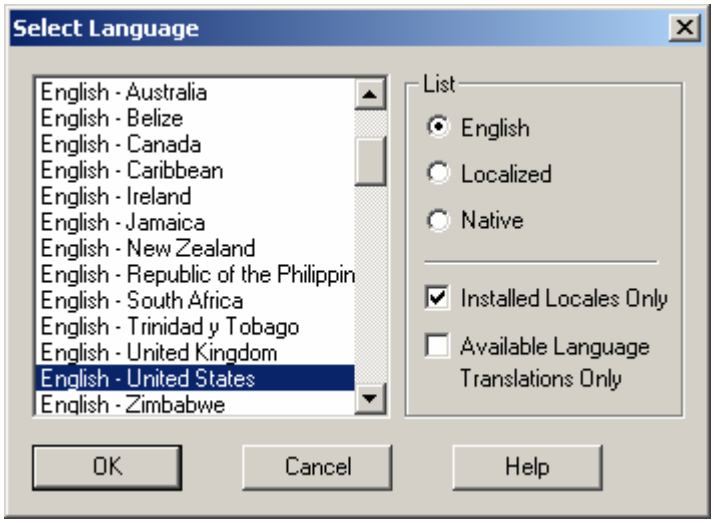
View Menu Commands

Command	Shortcut Keys	Function
Toolbars		Toggles the standard and data manipulation toolbars.
Status Bar		Toggles the status bar.
Large Icons	F7	Displays items as large icons.
Small Icons	F8	Displays items as small icons.
List	F9	Displays items as a list.
Details	F10	Displays items as a list along with detailed information about the configuration of each item.
Dialog View	F11	Toggles the configuration window (right-hand pane).
Sort By		Displays a list of options for sorting the columns in the right-hand pane of the screen. The options listed depend on the level within the view.
Show/Hide Columns		Displays a list of options that you can choose to show or hide in the view.
Select Language		Opens the **Select Language** dialog box (see below). Choose the language you wish to use for your system (Unicode version only) and click **OK.** For navigation purposes, use the buttons and check boxes in the **List** section.
Global Refresh	F5	Refreshes the data for the entire Configurator screen.
Subtree Refresh	CTRL+F5	Refreshes only the data contained in the currently selected subtree.

Selecting Languages

The **Select Language** function on the **View** menu allows you to choose which language to use in your display. Choosing **Select Language** from the **View** menu opens the **Select Language** dialog box, shown in the figure below.

Note: A language resource .dll is required for language switching.



Select Language Dialog Box

Define the parameters listed in the table below. Then click **OK** to return to the work area**.**

Select Language Parameters

Parameter	Description
List	Lists available languages. Depending on which item you have selected, the view on the left will change. If **English** is checked, the languages will appear as their English name. If **Localized** is checked, the languages will appear with the native country in parentheses (for languages with several dialects only). When **Native** is checked, the languages are displayed the way they would be written in that language.
Installed Locales Only	If this is checked, local languages appear in the box.
Available Language Translations Only	Checking this box allows you to choose from available language translations only.

Go Menu

The **Go** menu commands are listed in the table below.

Go Menu Commands

Command	Shortcut Keys	Function
Back	CTRL+ALT+ Left Arrow	Moves the cursor back to the previously selected item in the tree control.
Forward	CTRL+ALT+ Right Arrow	Moves the cursor forward to the previously selected item in the tree control.
Up One Level		Moves the cursor up one level in the tree control.
Next Item	ALT+Down Arrow	Moves the cursor to the next item down in the tree control.
Previous Item	ALT+Up Arrow	Moves the cursor to the next item up in the tree view.
Expand Item	ALT+Left Arrow	Expands an item that contains a submenu.
Collapse Item	ALT+Right	Collapses an item that contains a submenu.

Command	Shortcut Keys	Function
	Arrow	
Page Up	ALT+PgUp	Moves the cursor up to the first item in the tree.
Page Down	ALT+PgDown	Moves the cursor down to the last visible item in the tree.
Home	ALT+Home	Moves the cursor up to the first item in the tree.
End	ALT+End	Moves the cursor down to the last visible item in the tree.
Areas	F2	Moves the cursor to the **Areas** tree control.
Configurations	F3	Moves the cursor to the **Alarm Configurations** tree control.
Nodes	F4	Moves the cursor to the **Nodes** tree control.
Next Pane	F6	Moves the cursor to the next pane.
Previous Pane	SHIFT+F6	Moves the cursor to the last pane used.

Action Menu

The **Action** menu contains the following commands:

Command	Function
Start Alarm Server	Starts the alarm server for the active configuration.
Stop Alarm Server	Stops the alarm server for the active configuration.

Only one of the above options will be available at a time, depending on the state of the Alarm OPC Server.

Tools Menu

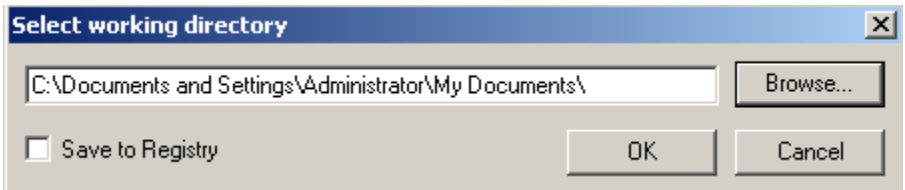
The **Tools** menu commands are listed in the table below.

Tools Menu Commands

Command	Function
Set Working Directory	Sets a working directory for all files relating to the saved configuration.
Options	Launches the **Options** dialog box.
Compact/Repair MS Access Database	Opens the **Compact/Repair MS Access Database** dialog box.

Setting the Working Directory

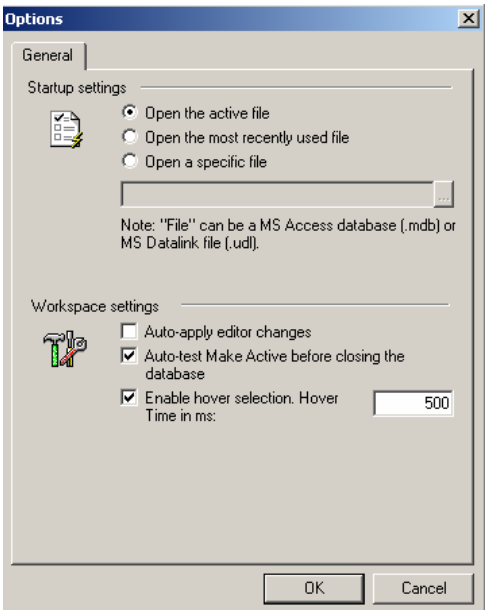
Selecting **Set Working Directory** from the **Tools** menu opens the **Set Working Directory** dialog box, shown below, which enables you to configure a custom directory in which all application configuration files will be stored and retrieved. Click **Browse** to select the directory.



Set Working Directory Dialog Box

Options

To choose additional settings, select **Options** from the **Tools** menu. This opens the **Options** dialog box, shown in the figure below. The **General** tab of the **Options** dialog box, sets the startup and workspace parameters for the Alarm Server Configurator.



Options Dialog Box: General Tab

Startup Settings

The **Startup Settings** options allow you to save regional settings in the registry so that they are applied each time you start the Configurator. This applies to the language settings as well as time and date settings. Select one of the following startup settings:

Open the active file: Launches the currently active database upon startup.

Open the most recently used file: Launches the recently opened database.

Open a specific file: Specifies a Microsoft Access (.mdb) or Microsoft Datalink (.udl) database to launch upon startup. To select a database, click the **...** button next to the text box and browse for the file. When this option is selected, the "active" database is overridden by the specified database.

Workspace Settings

The following **Workspace Settings** are available:

Auto-apply editor changes: Checking this option allows changes to the configuration database to be saved each time you switch dialogs without clicking on the **Apply** button or being shown a message asking if you would like to apply changes.

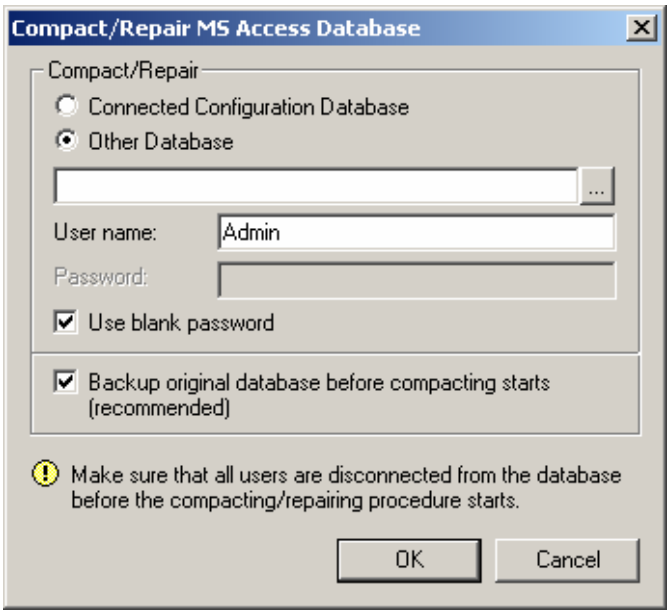
Auto-test Make Active before closing the database: When this option is checked, each time you exit a currently open (nonactive) database you are asked whether you want to make the database active.

Enable hover selection: Checking this option allows you to highlight an item by moving the mouse pointer over that item and keeping it there for a specified amount of time (in milliseconds).

Compacting and Repairing MS Access Databases

You can compact Microsoft Access databases, which can be either configuration databases or historical databases, using the **Compact/Repair MS Access Database** dialog box, shown in the figure below. To open this dialog box, select **Compact/Repair MS Access Database** from the **Tools** menu. Microsoft Access–based databases are subject to database fragmentation over time, and the support for the database will compact the target database, reclaim unused space, and drastically improve database performance.

Note: It is critical that no users or client applications are connected to the database at the time of compacting and that, if the **Backup Original Database** option is selected, there is plenty of available hard disk space.



Help Menu

Compact/Repair MS Access Database Dialog BoxHelp Menu

The **Help** menu contains the following commands:

Command	Shortcut Key	Function
Help Topics	F1	Launches the online help for the Configurator.
What's This?	SHIFT+F1	Displays context-sensitive help topics.
About Application		Launches the **SMAR About Box,** which contains information about the product version number, copyright, and available disk space. It also contains information about how to contact SMAR.

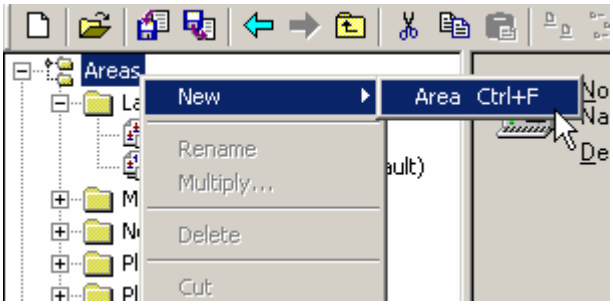
Areas

An **area** is used to group OPC alarm tags. This information can be used by clients for filtering purposes. A tag can exist under multiple areas, and an area can have a multiple levels. An area is defined by its name and the name of its parent branches. For example, a branch called Area 1 under plant Area A is different from Area 1 under plant Area B.

Creating a New Area

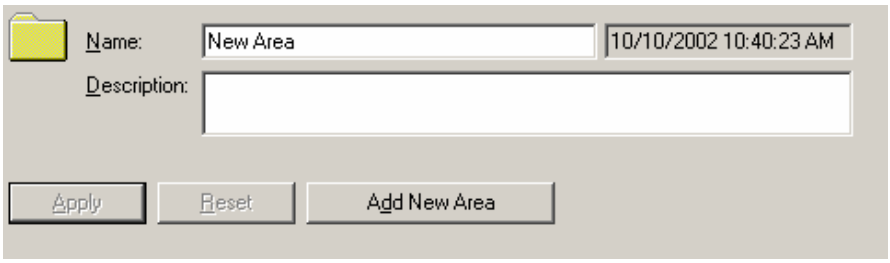
To create a new area:

1. Right-click on the **Areas** tree control of the Configurator and select **New > Area** from the pop-up menu, as shown in the figure below**.**



Creating a New Area

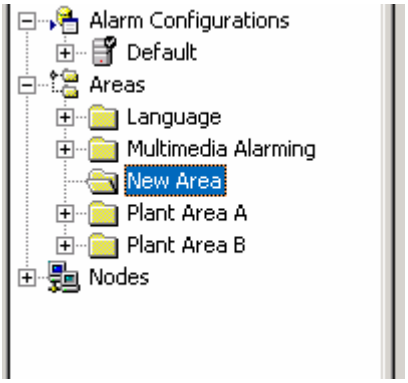
- The properties dialog box for the new area appears in the right-hand pane of the Configurator, as shown in the figure below.



Setting the Properties for the New Area

- In the **Name** field, type a name for the new area. You can optionally type a **Description** for the area.

- When you have finished configuring the area properties, click the **Apply** button. The new area appears under the **Areas** tree control, as shown in the figure below.

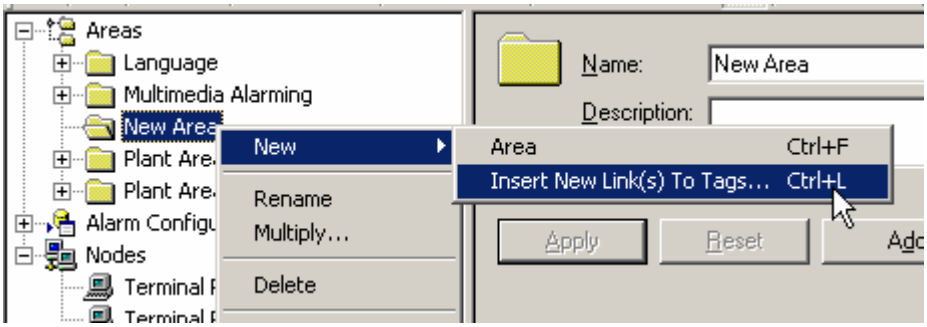


New Area Added to Tree Control

Linking to Alarm Tags

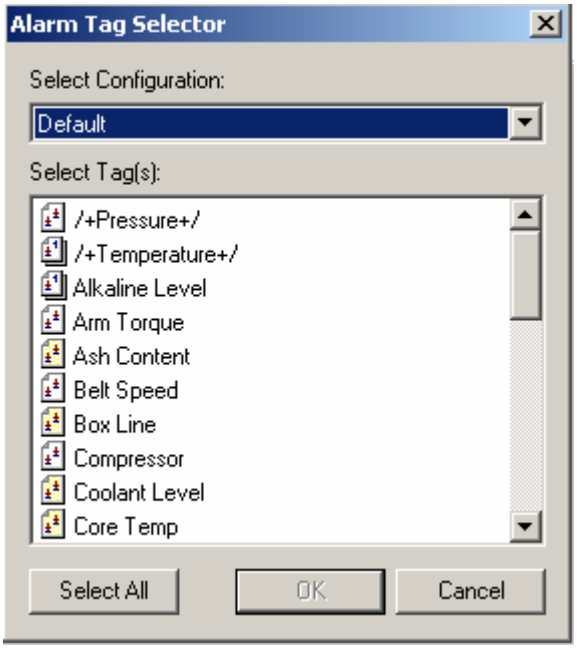
To create a new link to alarm tags from a particular area:

1. Right-click on an area in the **Areas** tree control of the Configurator and select **New > Insert New Link(s) to Tags** from the pop-up menu, as shown in the figure below.



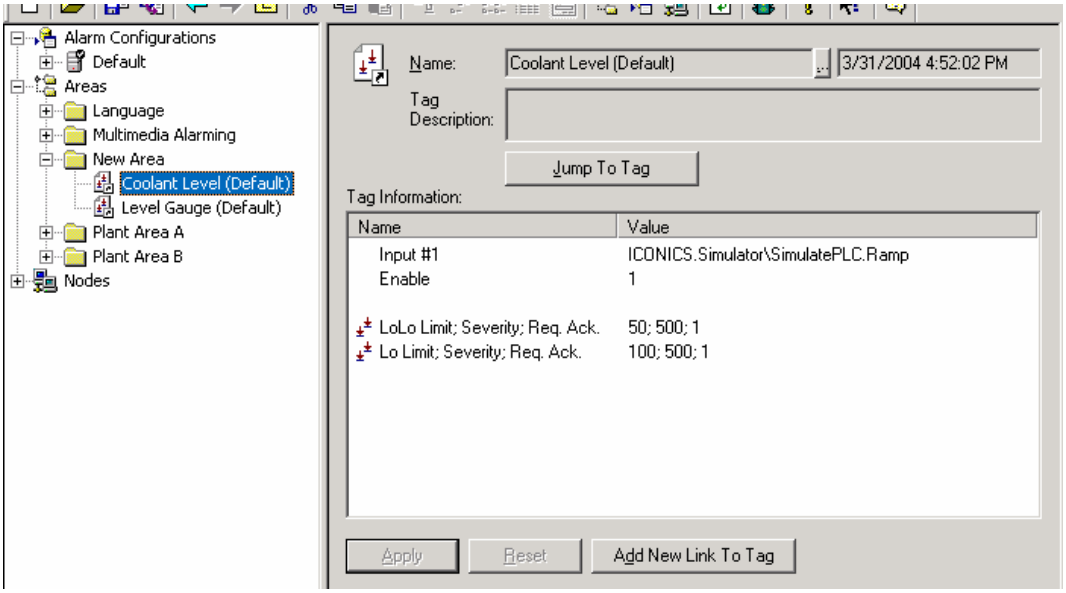
Creating an Alarm Tag Link

- This opens the **Alarm Tag Selector,** as shown in the figure below, which lists all alarm tags for each alarm configuration. Select an alarm configuration from the **Select Configuration** drop-down list, and then click on the tag(s) to which you want to link from the area.



Alarm Tag Selector

- The tag(s) appear under the area in the tree control, as shown in the figure below. In the right-hand pane, all the tag properties are displayed. To change the tag configuration properties, click the **Jump to Tag** button.



Linked Tags Added to Tree Control

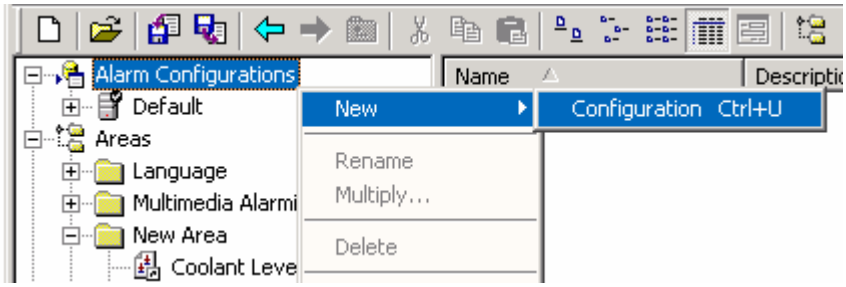
Alarm Configurations

An **alarm configuration** sets the parameters for OPC tags and defines how alarm information will be handled by the alarm server. Multiple configurations can be stored in a single database, but only one configuration can be active for a single alarm server at one time. Only one alarm configuration can be active per node at one time. Only one alarm server can run per node at one time.

Creating a New Alarm Configuration

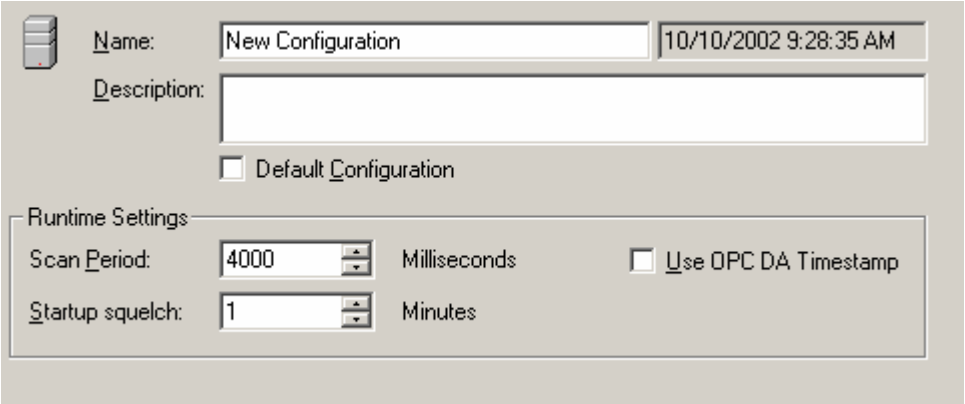
To create a new alarm configuration:

1. Right-click on the **Alarm Configurations** tree control of the Configurator and select **New > Configuration** from the pop-up menu, as shown in the figure below.



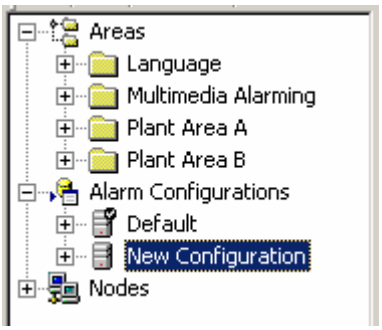
Creating a New Alarm Configuration

- The properties dialog box for the new configuration appears in the right-hand pane of the Configurator, as shown in the figure below.



Setting the Properties for the New Alarm Configuration

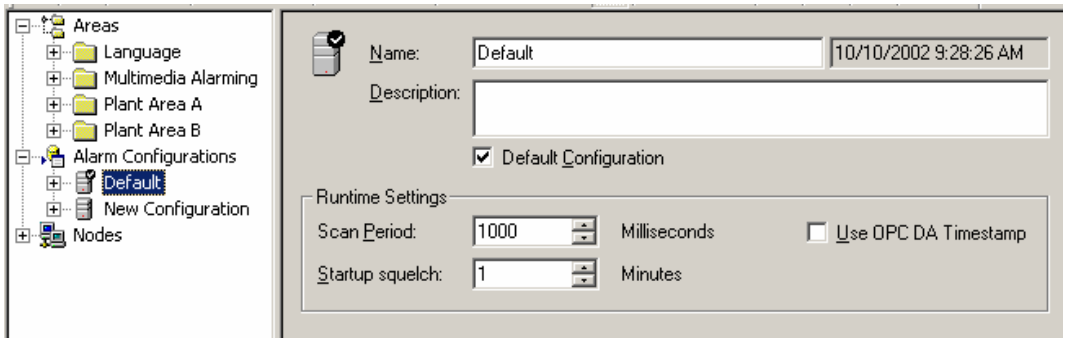
- In the **Name** field, type a name for the new configuration.
- When you have finished configuring the alarm configuration properties, click the **Apply** button. The new configuration appears under the **Alarm Configurations** tree control, as shown in the figure below.



New Alarm Configuration Added to Tree Control

Alarm Configuration Properties

Configure the following parameters for alarm configurations, as shown in the figure below.



Alarm Configuration Properties

Name: Type a name for the alarm configuration.

Description: Type in a description for the alarm configuration (optional).

Default Configuration: If you have multiple alarm configurations, you can specify a default configuration that will be used for the active database. Check this check box to make the current alarm configuration the default configuration.

Scan Period: This is the requested update rate (period in milliseconds) sent to all OPC Data Access servers used by this configuration. The default is one second (1000 milliseconds).

Startup squelch: Specifies the number of minutes from when the alarm server starts to inhibit the reporting of alarms with BAD quality. The default is 1 minute. When the alarm server starts, it may cause underlying OPC Data Access Servers to start. During startup, many OPC Data Access

servers will send data values with BAD quality until an initial value is received from the device. Adjust this setting to eliminate erroneous alarms on startup. At the end of the defined period, any event notifications being suppressed for BAD quality will be reported.

Note: This setting does not suppress all alarm processing and reporting during this period. As soon as an input quality is first reported as GOOD, normal alarm processing begins. In most cases, this happens well before the squelch period ends.

Use OPC DA Timestamp: By default, the alarm server generates timestamps internally using the system clock. When this check box is checked, the timestamps provided by the OPC Data Access servers are used instead. If an alarm has more than one input, the latest timestamp will be used.

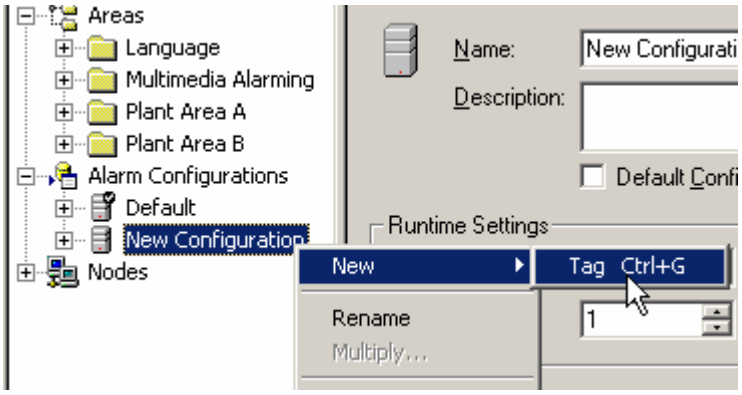
Tags

A **tag** represents a single object for OPC alarm information. An alarm tag can contain information for multiple types of OPC alarms, including deviation, limit, rate of change, and digital alarms.

Creating a New Tag

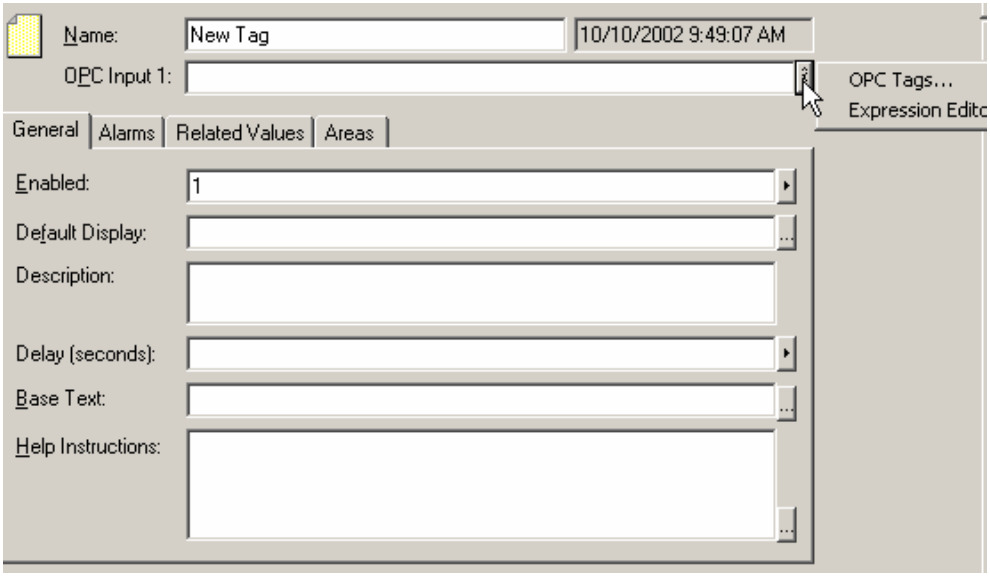
To create a new tag:

1. Right-click on an alarm configuration in the tree control of the Configurator and select **New > Tag** from the pop-up menu, as shown in the figure below.



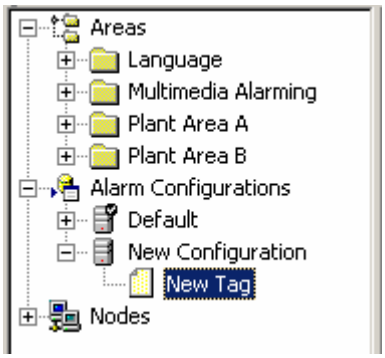
Creating a New Tag

- The properties dialog box for the new tag appears in the right-hand pane of the Configurator, as shown in the figure below.



Setting the Properties for the New Tag

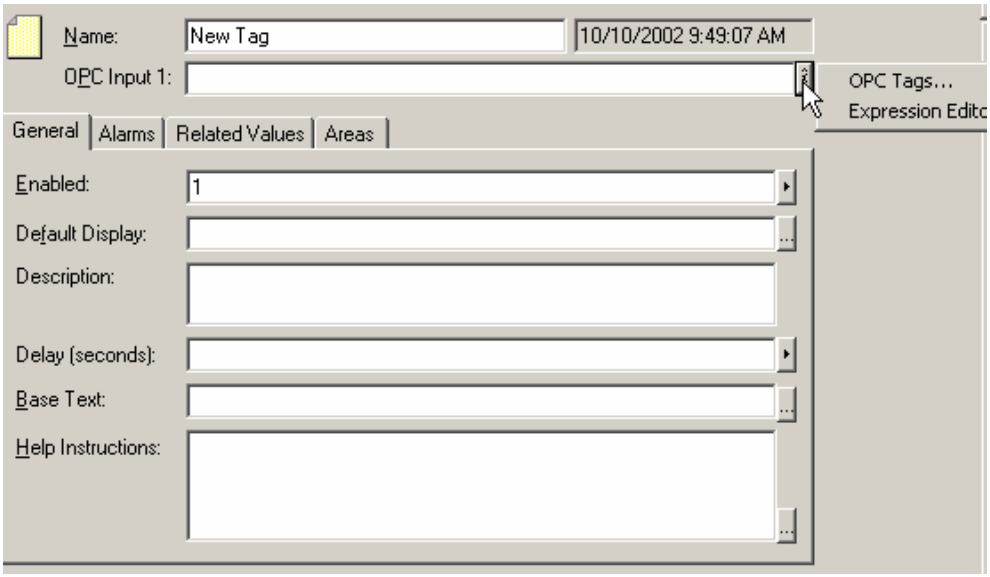
- In the **Name** field, type a name for the new tag.
- In the **OPC Input 1** field, specify the base field for the calculation of alarms. You can choose OPC tags and expressions for the various fields by clicking on the arrow button.
- When you have finished configuring the tag properties, click the **Apply** button. The new tag appears under the **Alarm Configurations** tree control, as shown in the figure below.



New Tag Added to Tree Control

Configuring Tag Properties

Configure the following parameters for alarm tags, as shown in the figure below.



Alarm Tag Properties

Name: Type a name for the tag. The alarm's tag name uniquely identifies the alarm.

OPC Input 1: Indicates an expression (which can contain an OPC tag) or an OPC tag itself as the source of data for the alarm. You can choose OPC tags and expressions for the various fields by clicking on the arrow buttons.

The tag properties contain four main sections:

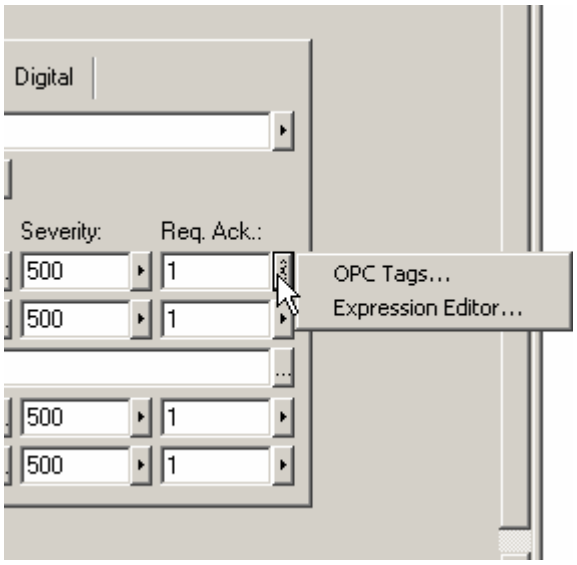
General

Alarms

Related Values

Areas

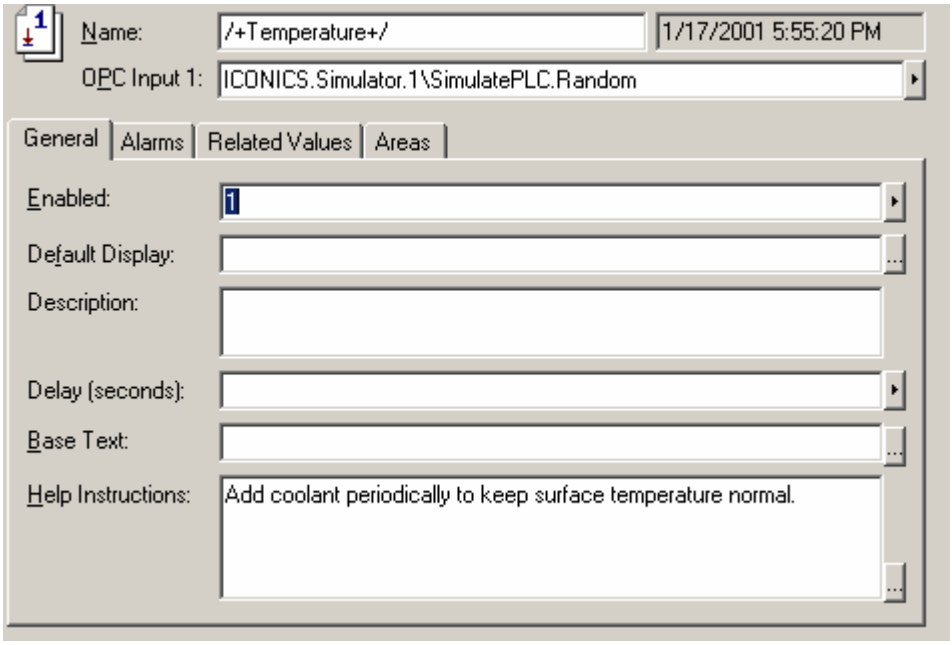
Throughout the tag properties sections, you can choose OPC tags and expressions for the various fields by clicking on the arrow buttons, as shown in the figure below.



Selecting OPC Tags and Expressions

General

The **General** section of the tags properties, shown in the figure below, configures the following general tag properties.



Tags: General Properties

Enabled: Specifies a value (expression or OPC tag) to determine if the alarm is enabled or not.

Default Display: Choose a file to display for the selected tag by clicking on the **...** button and browsing for a file.

Description: Type in a description for the alarm tag (optional).

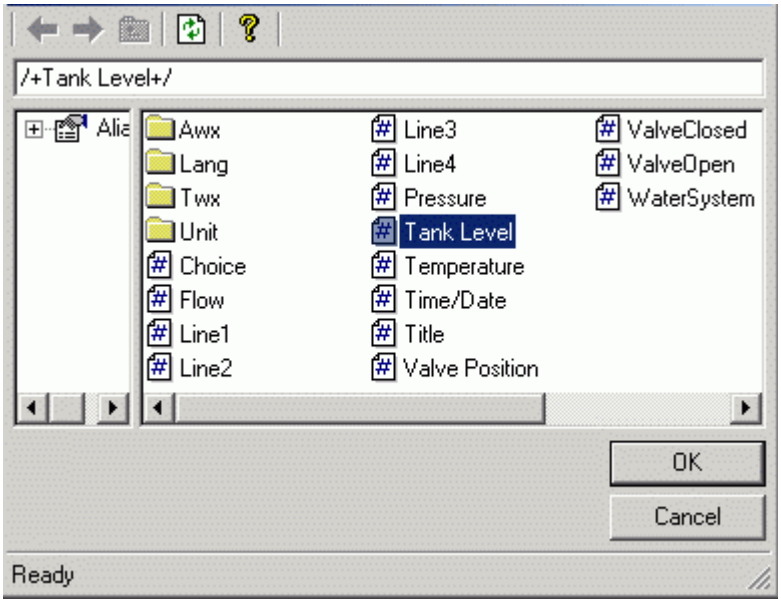
Delay: Normally alarms are reported as soon as they are detected. Sometimes it is desirable to delay reporting an alarm condition for some time after it is detected. If the alarm condition still exists after this delay, the alarm is reported. The delay is specified in seconds.

Base Text: Message text that will appear with the alarm.

Note: The **Base Text** field automatically adds a single space at the beginning of the text string, so you should be aware of this when filtering alarms.

Help Instructions: Type in the text that will be displayed in the Alarm Viewer screen when the associated tag reaches the alarming state. This helps guide operators through corrective action steps to solve or acknowledge a particular alarm. You can enter information directly or paste text from the Clipboard.

Clicking the **...** button in the **Help Instructions** and **Base Text** fields opens the **Language Alias Browser,** as shown in the figure below. The browser includes all languages aliases in the language database. All language aliases that are configured in the Language Configurator are conveniently available to choose from inside the browser. The tree control of the Language Configurator is mimicked in the tree control of the Language Alias Browser. Select a language alias by double-clicking the alias name. The alias name appears at the top of the browser, which automatically adds the /+ and +/ delimiters to the alias name. Click the OK button.



Selecting an Alias From the Language Alias Browser

Alarms

The **Alarms** section of the tags properties contains four tabs that describe the limits of each tag and when an alarm will be set off:

Limit

Deviation

Rate of Change

Digital

Note: If data are entered on either the **Limit** or **Deviation** tabs, the tag is defined as an **Analog** tag. If data are entered on either the **Rate of Change** or **Digital** tabs, the tag is defined as a **Digital** tag. A tag that contains data on at least one tab from each group is classified as an **Analog/Digital** tag.

Calculation of Alarms

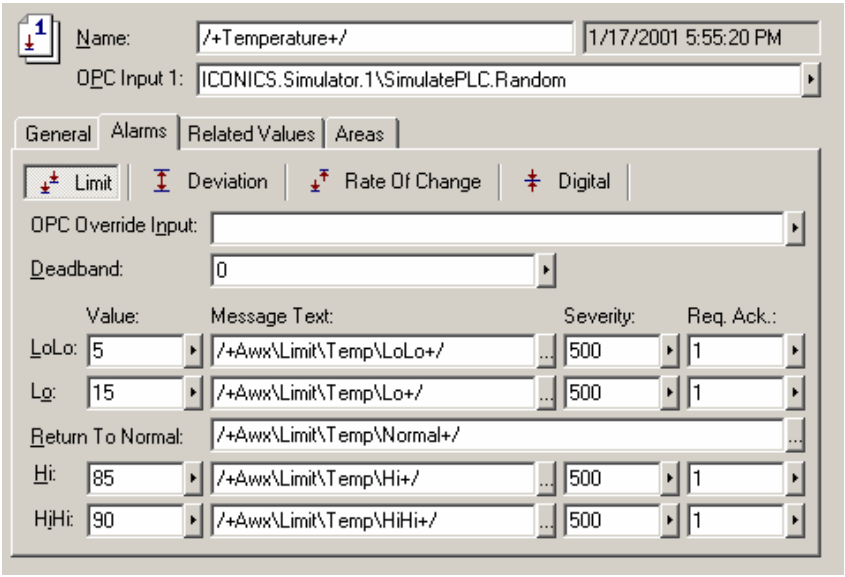
It is important to note that alarm states are calculated per update of an OPC tag. This means that alarm tags that have multiple OPC tags associated with a state will be calculated once for each OPC tag update. For example: A **limit** alarm has an OPC tag for the **OPC Input 1** field and for the **LoLo** field. Both tags change value and are updated to the alarm server simultaneously. The server will then calculate the limit value once for the OPC Input 1 field and once for the LoLo field. The order of fields calculated is random and determined by the order they are placed in the update queue.

In normal operation this is not a concern, however this can cause posting of alarms due to "noise" situations. Continuing with the above example, if the LoLo value changed from 5 to 15 and the OPC Input value changed from 6 to 16, an alarm could be posted if the new LoLo value is calculated before the new OPC input value, even though these two numbers changed "simultaneously." This

can be especially true when using alias values, as each of the OPC data inputs will be calculated individually.

Limit

The **Limit** tab of the **Alarms** section of the tag properties, shown in the figure below, sets the secondary OPC input and sets the values for the four levels of alarms: **LoLo, Lo, Hi,** and **HiHi.**



Alarm Types: Limit Tab

The **OPC Override Input** field is used to replace the **OPC Input 1** base field for the calculation of alarms. This field is optional and if left blank the default field of OPC Input 1 will be used.

Deadband indicates the deadband value to apply to the converted analog values. The deadband value is required and is calculated on borderline alarming limit values to prevent repeated alarm cycles.

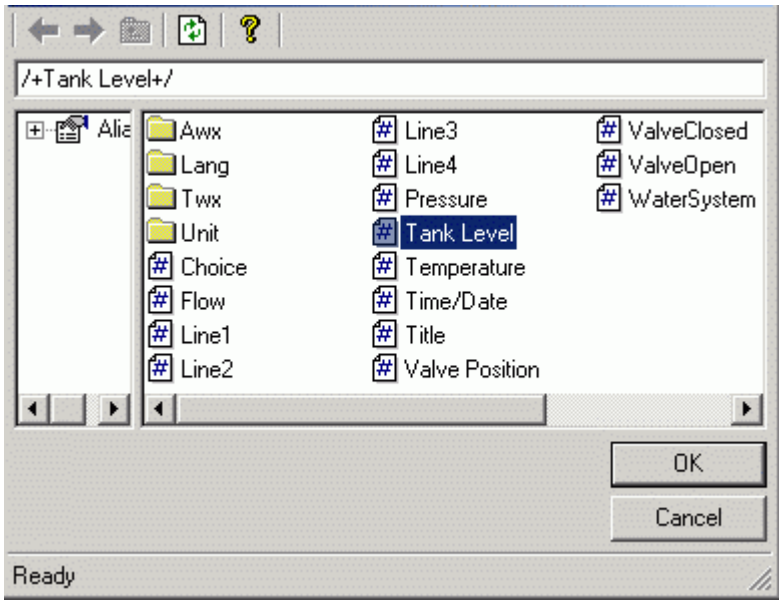
The **Value** field is used to calculate the state of the input fields. For example, a value of 10 for LoLo is compared with the value of OPC Input 1 or OPC Override Input to determine if the alarm is in LoLo state.

In the **Message Text** field, enter the warning message that will appear when the alarm is sent. The message can be any text string, including a language alias (Unicode version only).

In the **Return to Normal** field you to enter the text that will appear when the alarm is taken care of (e.g. has been acknowledged). The message can be any text string, including a language alias(Unicode version only).

Note: It is not necessary to enter a message text or a base text. The Server will default to the OPC subcondition name and the OPC condition name. For example, a LoLo alarm will post a description of LoLo limit.

Clicking the **...** button opens the **Language Alias Browser,** as shown in the figure below. The browser includes all languages aliases in the language database. All language aliases that are configured in the Language Configurator are conveniently available to choose from inside the browser. The tree control of the Language Configurator is mimicked in the tree control of the Language Alias Browser. Select a language alias by double-clicking the alias name. The alias name appears at the top of the browser, which automatically adds the /+ and +/ delimiters to the alias name. Click the OK button.



Selecting an Alias From the Language Alias Browser

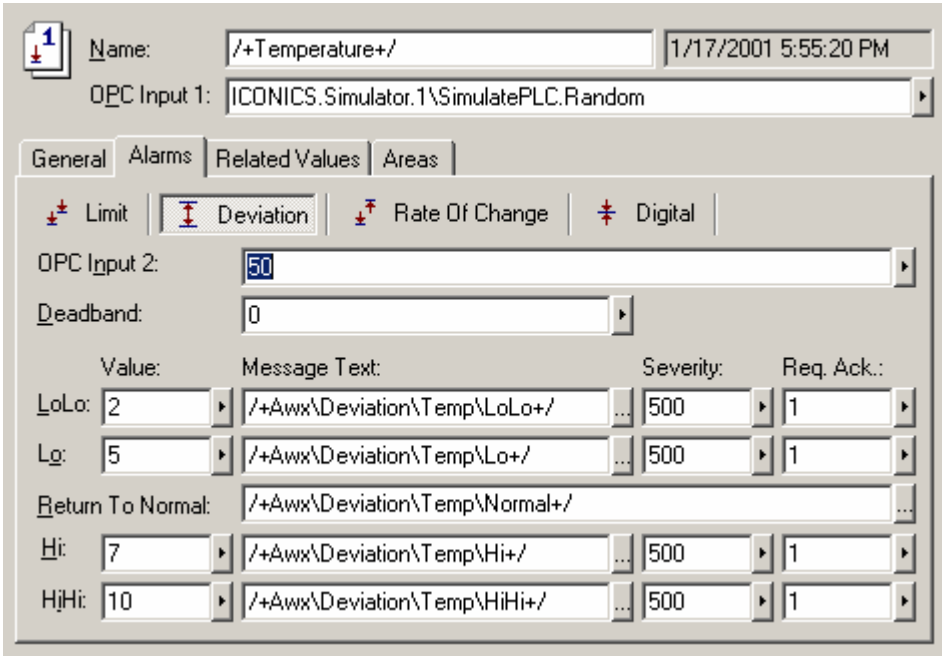
Severity is the OPC-defined value for alarm Priority. The valid OPC severity range is 0 (lowest) to 1000 (highest).

The **Requires Ack** field is used for OPC condition alarms to determine whether the alarm needs a user acknowledgement. If the **Requires Ack** field value is 1, then the alarm requires a user acknowledgement. If the value is 0, then the alarm is posted as already acknowledged.

Note: Changes to the alarm property fields (HiHi, LoLo, Hi, Lo, Message Text, etc.) in runtime through an OPC tag update will be automatically saved to the database, over-writing any values specified in configuration mode.

Deviation

The **Deviation** tab of the **Alarms** section of the tag properties,, shown in the figure below, allows the configuration of alarms where the limits are tested against the difference between two inputs: **OPC Input 1** and **OPC Input 2.** The OPC Input 2 field is mandatory and is used to calculate the deviation from the OPC Input 1 base field.



Alarm Types: Deviation Tab

Deadband indicates the deadband value to apply to the converted analog values. The deadband value is required and is calculated on borderline alarming limit values to prevent repeated alarm cycles.

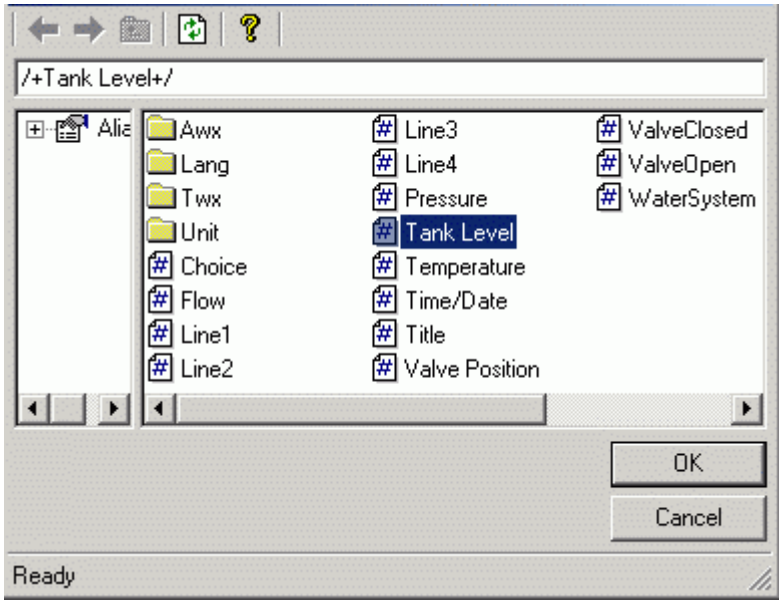
The **Value** field is used to calculate the state of the input fields. For example, a value of 10 for LoLo is compared with the value of OPC Input 1 or OPC Override Input to determine if the alarm is in LoLo state.

In the **Message Text** field, enter the warning message that will appear when the alarm is sent. The message can be any text string, including a language alias (Unicode version only).

In the **Return to Normal** field you to enter the text that will appear when the alarm is taken care of (e.g. has been acknowledged). The message can be any text string, including a language alias(Unicode version only).

Note: It is not necessary to enter a message text or a base text. The Server will default to the OPC subcondition name and the OPC condition name. For example, a LoLo alarm will post a description of LoLo limit.

Clicking the **...** button opens the **Language Alias Browser,** as shown in the figure below. The browser includes all languages aliases in the language database. All language aliases that are configured in the Language Configurator are conveniently available to choose from inside the browser. The tree control of the Language Configurator is mimicked in the tree control of the Language Alias Browser. Select a language alias by double-clicking the alias name. The alias name appears at the top of the browser, which automatically adds the /+ and +/ delimiters to the alias name. Click the OK button.



Selecting an Alias From the Language Alias Browser

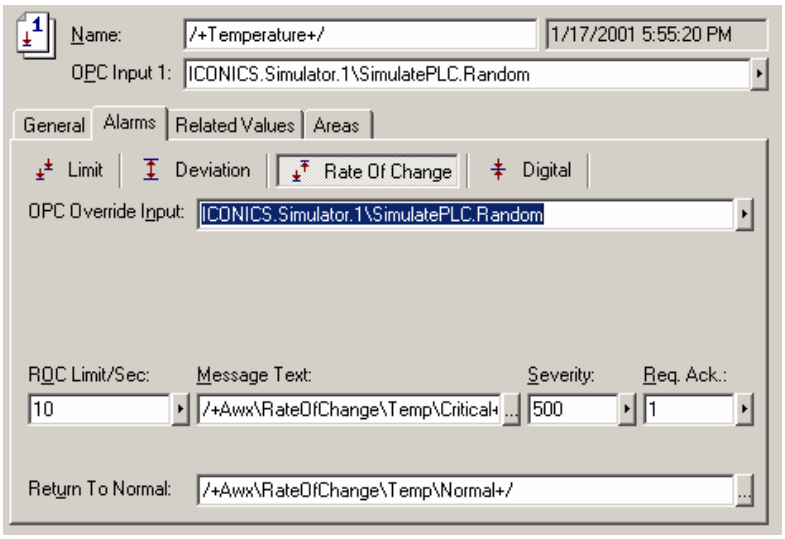
Severity is the OPC-defined value for alarm Priority. The valid OPC severity range is 0 (lowest) to 1000 (highest).

The **Requires Ack** field is used for OPC condition alarms to determine whether the alarm needs a user acknowledgement. If the **Requires Ack** field value is 1, then the alarm requires a user acknowledgement. If the value is 0, then the alarm is posted as already acknowledged.

Note: Changes to the alarm property fields (HiHi, LoLo, Hi, Lo, Message Text, etc.) in runtime through an OPC tag update will be automatically saved to the database, over-writing any values specified in configuration mode.

Rate of Change

The **Rate of Change** tab of the **Alarms** section of the tag properties, shown in the figure below, sets an alarm if an input changes at a rate higher than **ROC Limit/Sec.** The remaining fields on this tab are identical to those on the **Limit** tab.



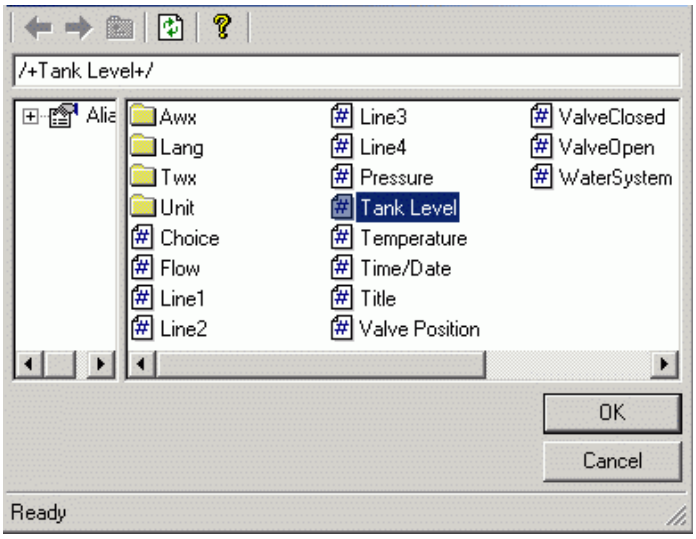
Alarm Types: Rate of Change Tab

In the **Message Text** field, enter the warning message that will appear when the alarm is sent. The message can be any text string, including a language alias (Unicode version only).

In the **Return to Normal** field you to enter the text that will appear when the alarm is taken care of (e.g. has been acknowledged). The message can be any text string, including a language alias(Unicode version only).

Note: It is not necessary to enter a message text or a base text. The Server will default to the OPC subcondition name and the OPC condition name. For example, a LoLo alarm will post a description of LoLo limit.

Clicking the **...** button opens the **Language Alias Browser,** as shown in the figure below. The browser includes all languages aliases in the language database. All language aliases that are configured in the Language Configurator are conveniently available to choose from inside the browser. The tree control of the Language Configurator is mimicked in the tree control of the Language Alias Browser. Select a language alias by double-clicking the alias name. The alias name appears at the top of the browser, which automatically adds the /+ and +/ delimiters to the alias name. Click the OK button.



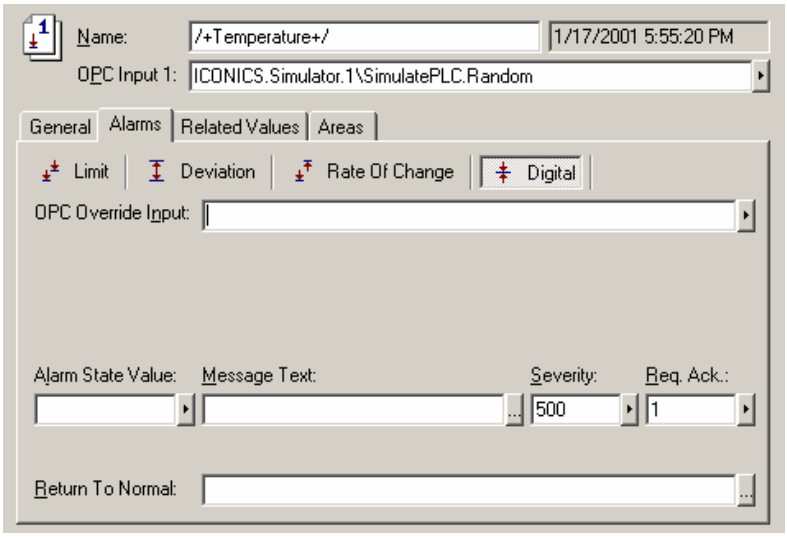
Selecting an Alias From the Language Alias Browser

Severity is the OPC-defined value for alarm Priority. The valid OPC severity range is 0 (lowest) to 1000 (highest).

The **Requires Ack** field is used for OPC condition alarms to determine whether the alarm needs a user acknowledgement. If the **Requires Ack** field value is 1, then the alarm requires a user acknowledgement. If the value is 0, then the alarm is posted as already acknowledged.

Digital

The **Digital** tab of the **Alarms** section of the tag properties, shown in the figure below, sets an alarm if the comparison between the **Alarm State Value** and the input state is TRUE. The remaining fields on this tab are identical to those on the **Limit** tab.



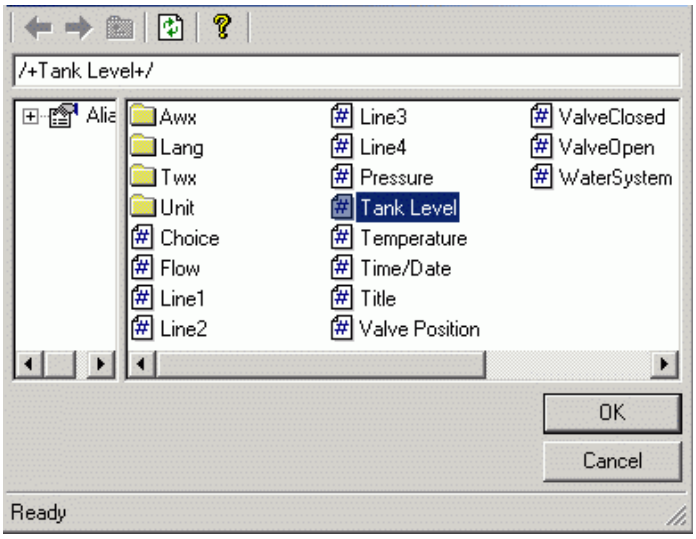
Alarm Type Digital Tab

In the **Message Text** field, enter the warning message that will appear when the alarm is sent. The message can be any text string, including a language alias (Unicode version only).

In the **Return to Normal** field you to enter the text that will appear when the alarm is taken care of (e.g. has been acknowledged). The message can be any text string, including a language alias(Unicode version only).

Note: It is not necessary to enter a message text or a base text. The Server will default to the OPC subcondition name and the OPC condition name. For example, a LoLo alarm will post a description of LoLo limit.

Clicking the **...** button opens the **Language Alias Browser,** as shown in the figure below. The browser includes all languages aliases in the language database. All language aliases that are configured in the Language Configurator are conveniently available to choose from inside the browser. The tree control of the Language Configurator is mimicked in the tree control of the Language Alias Browser. Select a language alias by double-clicking the alias name. The alias name appears at the top of the browser, which automatically adds the /+ and +/ delimiters to the alias name. Click the OK button.



Selecting an Alias From the Language Alias Browser

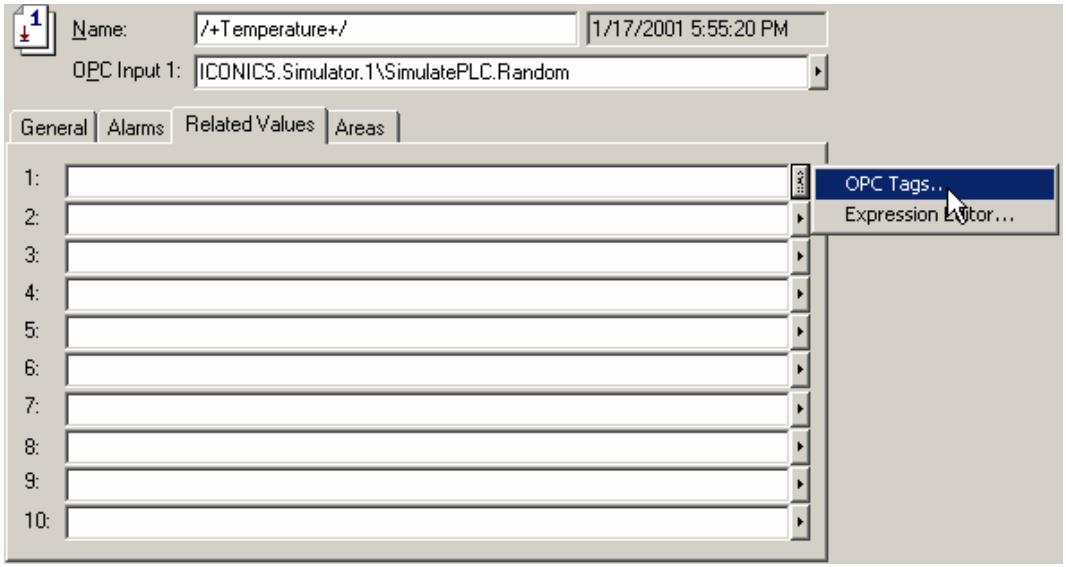
Severity is the OPC-defined value for alarm Priority. The valid OPC severity range is 0 (lowest) to 1000 (highest).

The **Requires Ack** field is used for OPC condition alarms to determine whether the alarm needs a user acknowledgement. If the **Requires Ack** field value is 1, then the alarm requires a user acknowledgement. If the value is 0, then the alarm is posted as already acknowledged.

Related Values

The related values feature allows up to 10 "snapshots" of data taken at the time of alarm to be permanently associated with that instance of the alarm. This is often used to associate the occurrence of an alarm with a particular lot or batch. A related value can be the value of an OPC data access item, an expression or a constant expression.

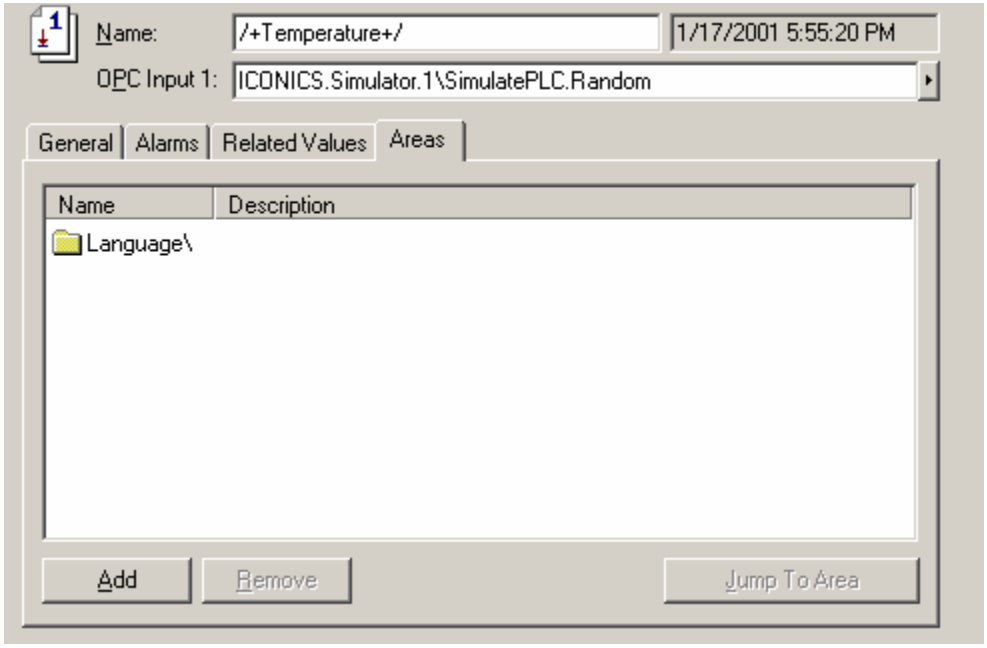
The **Related Values** section of the tags properties, shown in the figure below, allows you to associate up to 10 OPC tags or expressions with each alarm tag as “supplemental” information to the alarm. For example, you could relate a “Batch ID” to a specific alarm. Then, when the alarm becomes active, a permanent record of the Batch ID is also stored along with the alarm information. You can choose OPC tags and expressions for the various fields by clicking on the arrow buttons.



Tags: Related Values

Areas

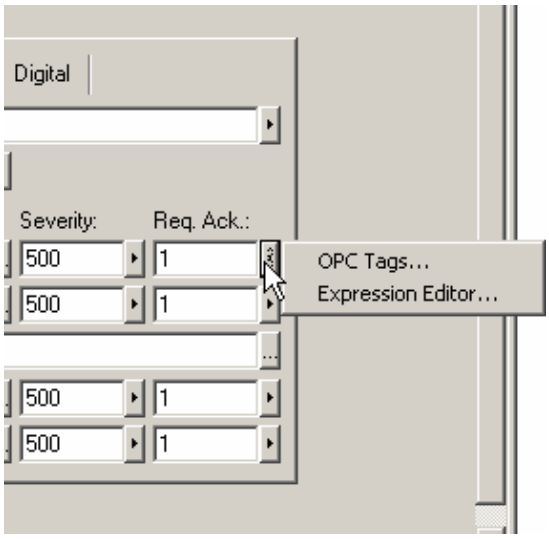
The **Areas** section of the tags properties, shown in the figure below, shows all areas to which the tag is linked. Clicking on an area takes you to the area configuration. You can assign an alarm to more than one area or grouping. For example, a tank limit alarm may be part of both the "Tank 1" area, as well as the "Water" area.



Tags: Areas

OPC Tags and Expressions

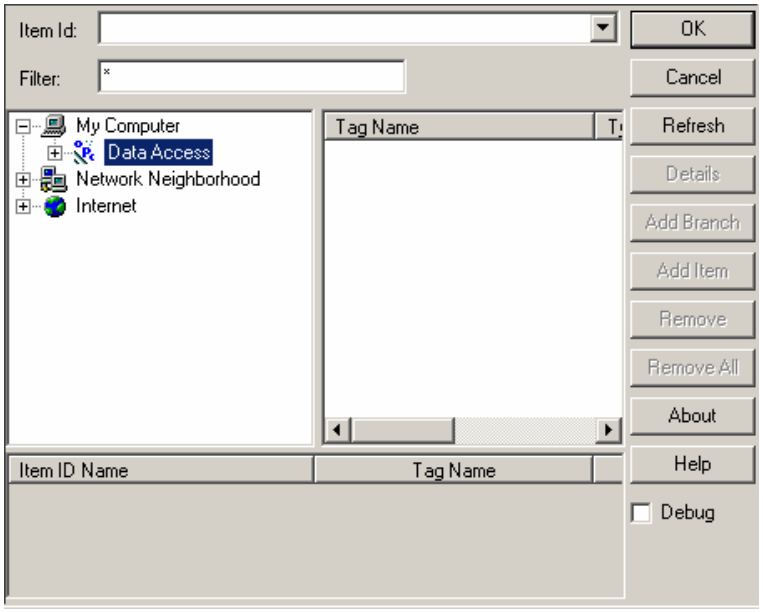
Throughout the tag properties sections, you can choose OPC tags and expressions for the various fields by clicking on the arrow buttons, as shown in the figure below.



Selecting OPC Tags and Expressions

OPC Tags

The Tag Browser, shown in the figure below, which allows you to select from OPC Data Access tags.



OPC Universal Tag Browser

Expression Editor

Selecting **Expression Editor** opens the **Edit Expresion** dialog, as shown in the figure below. The Expression Editor box has the following options:

Arithmetic

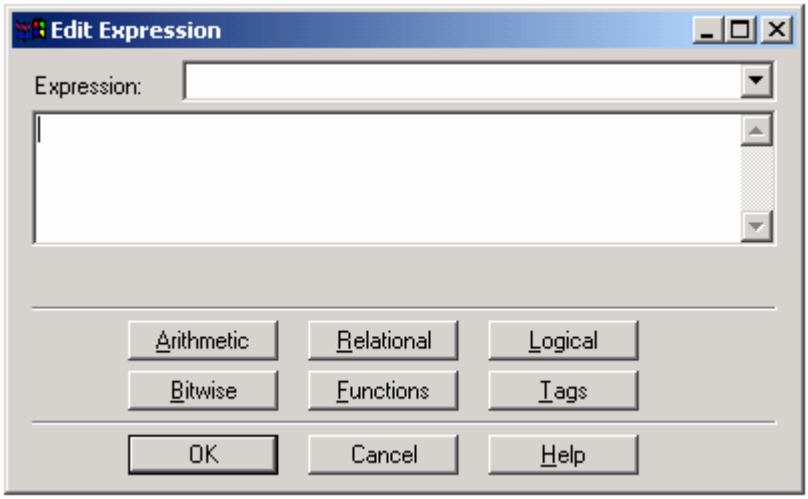
Relational

Logical

Bitwise

Functions

Each of these options is explained in greater detail in following sections. For complete information about writing and editing expressions, please see the Expression Editor Help documentation.



Expression Editor

Arithmetic

The symbols '+', '-', '*', '/' and '%' use the following format:

expression :: parameter **symbol** parameter

Where

Parameter	A local variable, an OPC tag, a constant, or another expression
Symbol	+ or - or * or / or %

Result

The expression results in a number of any type (float, long, etc.).

Examples

Symbol	Description	Example	Result
+	Addition	~~var1~~ + ~~var2~~	8+3 = 11
-	Subtraction	~~var1~~ - ~~var2~~	8-3 = 5
*	Multiplication	~~var1~~ * ~~var2~~	8*3 = 24
/	Division	~~var1~~ / ~~var2~~	8/3 = 2.66667
%	Calculates the remainder after division	~~var1~~ % ~~var2~~	8%3 = 2
(and)	Gives precedence to parts of the calculation	~~var1~~ / (~~var2~~ + ~~var3~~)	8/(3+2) = 1.6

Relational

The symbols '<', '>', '<=', '>=', '==' and '!=' use the following format:

expression :: parameter **symbol** parameter

Where

Parameter	A local variable, an OPC tag, a constant, or another expression
Symbol	< or > or <= or >= or == or !=

Result

The expression results in a Boolean value (0 or 1).

Examples

Symbol	Description	Example	Result
<	Less than	~~var1~~ < ~~var2~~	8<3 = 0
>	Greater than	~~var1~~ > ~~var2~~	8>3 = 1
<=	Less than or equal to	~~var1~~ <= ~~var2~~	8<=3 = 0
>=	Greater than or equal to	~~var1~~ >= ~~var2~~	8>=3 = 1
==	Equal to	~~var1~~ == ~~var2~~	8==3 = 0
!=	Not equal to	~~var1~~ != ~~var2~~	8!=3 = 1

Logical

The symbols '&&' and '||' use the following format:

expression :: parameter **symbol** parameter

The symbol '!' uses the following format:

expression :: **symbol** parameter

Where

Parameter	A local variable, an OPC tag, a constant, or another expression
Symbol	&& or || or !

Result

The expression results in a Boolean value (0 or 1).

Truth table

~~var1~~	0		not 0	
~~var2~~	0	not 0	0	not 0
~~var1~~ && ~~var2~~	0	0	0	1
~~var1~~ || ~~var2~~	0	1	1	1
!~~var1~~	1	1	0	0

Examples

Symbol	Description	Example	Result
&&	And	~~var1~~ && ~~var2~~	8 && 3 = 1
||	Or	~~var1~~ || ~~var2~~	8 || 3 = 1
!	Not	!~~var1~~	!8 = 0

Bitwise

The symbols '&', '|', and '^' of the bitwise group use the following format:

expression :: parameter **symbol** parameter

The symbol '~' of the logical group uses the following format:

expression :: **symbol** parameter

The symbols 'shl' and 'shr' of the bitwise group use the following format:

expression :: **symbol** (value, shift by)

Where

Parameter	A local variable, an OPC tag, a constant, or another expression
Symbol	&& or || or ^ or shl or shr or ~

Result

The expression results in a number when the parameters used contain numbers.

Bit Table

	Binary (Decimal)	Binary (Decimal)
~~var1~~	0000.0000.0000.1000 - (8)	0000.0000.0110.0000 - (96)
~~var2~~	0000.0000.0000.1010 - (10)	0000.0000.0000.1000 - (8)
~~var1~~ & ~~var2~~	0000.0000.0000.1000 - (8)	0000.0000.0000.0000 - (0)
~~var1~~ | ~~var2~~	0000.0000.0000.1010 - (10)	0000.0000.0110.1000 - (104)
~~var1~~ ^ ~~var2~~	0000.0000.0000.0010 - (2)	0000.0000.0110.1000 - (104)
shl (~~var1~~,3)	0000.0000.0100.0000 - (64)	0000.0011.0000.0000 - (768)
shr (~~var1~~,3)	0000.0000.0000.0001 - (1)	0000.0000.0000.1100 - (12)
~(~~var1~~)	1111.1111.1111.0111 - (-9)	1111.1100.1111.1111 - (-97)
bittest(~~var1~~,3)	0000.0000.0000.0001 - (1)	0000.0000.0000.0000 - (0)

Examples

Symbol	Description	Example	Result
&	Bit And	~~var1~~ & ~~var2~~	8 && 3 = 0
|	Bit Or	~~var1~~ | ~~var2~~	8 || 3 = 11
^	Bit eXclusive Or	~~var1~~ ^ ~~var2~~	8^3=11
shl	Bit shift left	shl(~~var1~~,3)	8<<3=64
shr	Bit shift right	shr(~~var1~~,3)	8>>3=1
~	Not (two's complement)	~(~~var1~~)	!8 = -9
bittest	Bit Test	bittest (5 , 0)	1

Note: The bittest function requires you to specify the position of the bit to be tested. You must indicate that it starts from 0. In other words, a bit position of "0" indicates the "less significant" bit.

Functions

The symbols 'sin', 'asin', 'cos', 'acos', 'tan', 'atan', 'log', 'ln', 'exp', 'sqrt', 'abs', 'ceil', and 'floor' use the following format:

expression :: **symbol** (parameter)

The symbols 'pow', 'min', and 'max' use the following format:

expression :: **symbol** (parameter,parameter)

The symbol 'if' uses the following format:

expression :: **symbol** (parameter,parameter,parameter)

Where

Parameter	A local variable, an OPC tag, a constant, or another expression
Symbol	sin, asin, cos, acos, tan, atan, log, ln, exp, sqrt, abs, ceil, floor, min, max, pow, or if

Result

The expression results in a number.

Examples

Symbol	Description	Example	Result
sin	sine of an angle in radians	sin(~~var1~~)	sin(0.785)=0.71
cos	cosine of an angle in radians	cos(~~var1~~)	cos(0.785)=0.71
tan	tangent of an angle in radians	tan(~~var1~~)	tan(0.785)=1.0
asin	arc sine returns an angle in radians	asin(~~var1~~)	asin(0.5)=0.52
acos	arc cosine returns an angle in radians	acos(~~var1~~)	acos(0.5)=1.05
atan	arc tangent returns an angle in radians	atan(~~var1~~)	atan(1)=0.785
sqrt	Returns the square root	sqrt(~~var1~~)	sqrt(100)=10
pow	Returns value 1 raised to the power value 2	pow(~~var1~~,~~var2~~)	pow(100,1.5)=1000
log	10 based logarithm	log(~~var1~~)	log(100)=2
ln	*e* based logarithm	ln(~~var1~~)	ln(7.389)=2
exp	Exponential	exp(~~var1~~)	exp(2)=7.389
abs	Absolute value	abs(~~var1~~)	abs(-1)=1
ceil	Integer ceiling	ceil(~~var1~~)	ceil(7.39)=8
floor	Integer floor	floor(~~var1~~)	floor(7.39)=7
min	Lowest value of two	min(~~var1~~,~~var2~~)	min(10,5)=5
max	Highest value of two	max(~~var1~~,~~var2~~)	min(10,5)=10

Symbol	Description	Example	Result
if	Conditional statement	if(~~var1~~<~~var2~~, ~~var1~~,~~var2~~)	if(5<8,5,8)=5
like	Wildcard string compare	Like(string, pattern, casesensitive')	
quality	Quality of tag or expression	See below.	See below.
tostring	Type conversion	See below.	See below.
0x	Hexadecimal constant	x=0x11	17
0t	Octal constant	x=0t11	9
0b	Binary constant	x=0b11	3

Note: For the like operator: "string" equals the string to search in; "pattern" equals the string to search for (can include wildcards); nonzero for case-sensitive search; zero for case-insensitive search. String syntax is $"string"$.

You can use these special characters in pattern matches in string:

- ? Any single character.
- Zero or more characters.
- # Any single digit (0-9).
- [charlist] Any single character in charlist.
- [!charlist] Any single character not in charlist.

Quality

The **quality** option on the **Functions** menu of the **Expression Editor** is used to evaluate the quality of an OPC tag or an expression.

The following general syntax is used for quality expressions:

x=quality(expression)

Note: The "(expression)" can also be a simple expression composed of a single tag.

The **quality** function returns the OPC quality of the string between parentheses as one of the following results:

192: quality is GOOD

64: quality UNCERTAIN

0: quality BAD

Note: The OPC Foundation establishes the value ranges for quality. There are actually varying degrees of quality:

GOOD: 192-252

UNCERTAIN: 64-191

BAD: 0-63

For more information, refer to the *OPC Data Access Custom Interface Standard* available for download at the OPC Foundation's Web site, www.opcfoundation.org/.

Example Quality Expression

Expression	Result
x=quality({{SMAR.Simulator.1\SimulatePLC.PumpStatus}})	192 (Quality GOOD)

The quality of an expression is determined through the evaluation of each single tag in the expression. Thus, if you have multiple tags in an expression (and each tag has a different quality), the result of the expression (i.e. 192 [GOOD], 64 [BAD], or 0 [UNCERTAIN]) corresponds to the quality of the tag with the lowest quality. If an expression contains a conditional statement (e.g. if, then, or else), then the result of the expression is affected only by the quality of the branch being executed.

Consider the following sample expression:

x= if (quality({{Tag1}}) == 192, {{Tag1}}, {{Tag2}})

This expression can be read as follows:

"If the quality of Tag1 is GOOD (i.e. 192), then the expression result (x) is the value of Tag1. In all other cases (i.e. the quality of Tag1 is UNCERTAIN or BAD), the expression result (x) is the value of Tag2."

We can calculate the results for this expression using different qualities for Tag1 and Tag2, as shown in the figure below.

Case	Tag1 quality	Tag2 quality	Result	Result quality
1	GOOD	GOOD	Tag1	192 (GOOD)
2	GOOD	UNCERTAIN	Tag1	192 (GOOD)
3	GOOD	BAD	Tag1	192 (GOOD)
4	UNCERTAIN	GOOD	Tag2	192 (GOOD)
5	UNCERTAIN	UNCERTAIN	Tag2	64 (UNCERTAIN)
6	UNCERTAIN	BAD	Tag2	0 (BAD)
7	BAD	GOOD	Tag2	192 (GOOD)
8	BAD	UNCERTAIN	Tag2	64 (UNCERTAIN)
9	BAD	BAD	Tag2	0 (BAD)

In cases 1-3 above, the quality of Tag1 is GOOD, and therefore the result of the expression is GOOD. Thus, the result of the expression is not affected by the quality of Tag2 (the “else” branch of the expression), which is ignored.

In cases 4-6, the quality of Tag1 is UNCERTAIN, and therefore the result of the expression is the quality of Tag2.

In cases 7-9, the quality of Tag1 is BAD, and therefore the result of the expression is the quality of Tag2.

Note: The “quality()” function returns a value that represents the quality of the expression within the parentheses but is always GOOD_QUALITY. For example, if Tag1 is BAD_QUALITY then the expression “x=quality({{Tag1}})" will return 0 with GOOD_QUALITY.

The result of an expression is the minimum quality of the evaluated tag in the expression and is affected only by the quality of the conditional (if, then, or else) branch that is executed.

Consider the following sample expression:

x= if ({{TAG_01}}>0,{{TAG_02}},{{TAG_03}})

This expression can be read as follows:

"If the value of TAG_01 is greater than 0, then the expression result (x) is TAG_02. If the value of TAG_01 is less than or equal to 0, then the expression result (x) is TAG_03."

Let's assume that the following values and qualities for these tags:

TAG_01=5 with quality GOOD

TAG_02=6 with quality UNCERTAIN

TAG_03=7 with quality BAD

Because the value of TAG_01 is 5 (greater than 0), the expression result is TAG_02. Thus, the final expression result is 6, and the final expression quality is UNCERTAIN.

Type Conversion

The **tostring** option on the **Functions** menu of the **Expression Editor** takes the value of whatever item is in parentheses and converts it into a string as follows:

The value is +(value)+unit

It can be used to convert from number to string, and it can be very useful for string concatenation.

The proper syntax for the **tostring** option is:

x=$"The value is "$ + tostring(value) + $" unit"$

Note: In the expression above, the word "unit" is placeholder text for a user-specified unit of measurement or variable (e.g. Watt, inches, meters, etc.).

Example Expressions Type Conversion

Expression	Result
x=$"The value is "$ + tostring({{gfwsim.ramp.float}}) + $" Watt"$	“The value is 543.2345152 Watt”

Constants

The **Functions** menu of the **Expression Editor** supports constant values, including hexadecimal, octal, and binary formats.

Example Expressions Using Constants

Expression	Result
x=0x11	17
x=0t11	9
x=0b11	3

The **Expression Editor** conveniently inserts the 0x and 0t and 0b prefixes for you so do not have to recall them.

Interpreting and Translating Constants

The examples below show how values are calculated for each type of constant.

Hexadecimal: 0x20A = 2 * (16^2) + 0 * (16^1) + 10 * (16^0) = 2*256 + 0*16 + 10 * 1 = 512 + 0 + 10 = 522

Octal: 0t36= 3 * (7^1) + 6 *(7^0) = 3* 7 + 6* 1= 21 + 6 = 27

Binary: 0b110 = 1 * (2^2) + 1 * (2^1) + 0 * (2^ 0) = 1 * 4 + 1 * 2 + 0 * 1 = 4+2+0 = 6

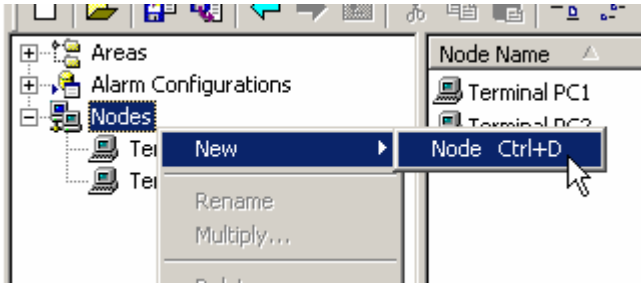
Nodes

A **Node** is the PC network name associated with a particular configuration. When the alarm server starts, it checks the database for its node name. If the server does not find an alarm configuration associated with its node name, it will run the default alarm configuration. A configuration can be run on multiple nodes; however only one configuration can be run on a node (PC) at one time.

Adding a New Node

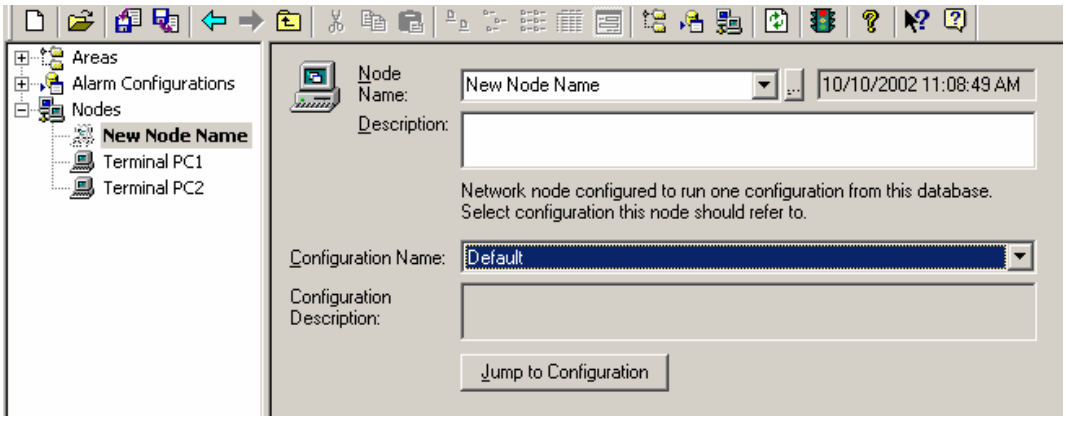
To add a new node to the configuration:

1. Right-click on the **Nodes** tree control of the Configurator and select **New > Node** from the pop-up menu, as shown in the figure below.



Creating a New Node

- The properties dialog box for the new node appears in the right-hand pane of the Configurator, as shown in the figure below.



Setting the Properties for the New Node

- In the **Name** field, type a name for the new node. You can optionally type a **Description** for the node.
- Under **Configuration Name,** select an alarm configuration from the drop-down list. If the alarm server does not find an alarm configuration associated with its node name, it will run the default alarm configuration. To view the configuration properties, click **Jump to Configuration.**
- When you have finished configuring the node, click the **Apply** button. The new area appears under the **Nodes** tree control.

Running the Alarm Server

Starting the Alarm Server

The AlarmWorX Server may be launched in one of four ways:

Automatically on boot if it is installed as an NT Service.

By selecting **Start Alarm Server** from **Action** menu of the Alarm Server Configurator.

When an OPC Alarm and Events client creates a connection to the alarm server.

Through ProcViewTray.

Of these four methods, the third item is the least useful since the server should normally be running and processing alarms even if no alarm clients are active.

When launched, the alarm server will open the active configuration database and query for a configuration that is set to run on that node. If a configuration with a matching node name is not found, the default alarm configuration will be run.

While running, the server will continue to poll the configuration database (every 30 seconds) in order to respond to any changes made by the Configurator.

The alarm server supports online configuration changes to allow minor changes in alarm configuration to be performed without shutting down the server. Minor things would be adding or removing a tag, changing an alarm limit, and adding (but not removing) an area. Making even these minor changes online can have side effects, like duplicate events sent to clients and client messages that can no longer be acknowledged. In a live functioning plant it is possible that these minor side effects would not outweigh the alternative of shutting down and restarting the alarm server.

Whenever practical, it is desirable to toggle the server off and on to be sure only the latest configuration is being used. For major database changes within the active database or changing the active database, the server must be shutdown and restarted.

OPC Alarm and Events Interface

The AlarmWorX Server supports all of the mandatory and most of the optional interfaces and methods of the OPC Alarm & Events specification.

The following optional methods are **not** currently supported:

IOPCEventServer::TranslateToItemIDs

IOPCEventServer::EnableConditionByArea

IOPCEventServer::EnableConditionBySource

IOPCEventServer::DisableConditionByArea

IOPCEventServer::DisableConditionBySource

Event Types and Categories

All events generated are of the OPC defined Event Type **Condition.** The Server defines the following **Event Categories** and uses the identical names for the **Condition Names:**

Deviation

Digital

Limit

Rate of Change

The **Limit** and **Deviation** conditions have the following Sub-conditions:

HiHi

Hi

Lo

LoLo

Note: The following categories are not used in the alarm server:

OPC Server Error

System Configuration

System Message

Event Attributes

The following event attributes are made available to subscribing clients:

Attribute	Deviation	Digital	Limit	Rate of Change	Type	Comment
ACK COMMENT	✔	✔	✔	✔	VT_BSTR	Comment entered when alarm was last acknowledged.
ALARM COUNT	✔	✔	✔	✔	VT_I4	Number of alarm transitions before acknowledge.
AREA	✔	✔	✔	✔	VT_ARRAY | VT_BSTR	Array of areas
CV	✔	✔	✔	✔	VT_R8 VT_BOOL	Current Value (OPC Input 1 or 2).
DEADBAND	✔		✔	✔	VT_R8	Alarm detection Deadband.
DEFAULT DISPLAY	✔	✔	✔	✔	VT_BSTR	A text string, usually a file name, that when launched provides related information.
HELP TEXT	✔	✔	✔	✔	VT_BSTR	Help information
LIMIT VALUE EXCEEDED	✔		✔	✔	VT_R8	The Current Value at the time the limit was exceeded.
LOOP DESC	✔	✔	✔	✔	VT_BSTR	A description of the Source (tag).
NEXT_LIM	✔		✔		VT_R8	The value of the next limit.
NORMAL STATE		✔			VT_BOOL	Value of the normal state (TRUE or FALSE).
PREV LIM	✔		✔		VT_R8	Value of the previous limit reached.
RELATED VALUE 01-10	✔	✔	✔	✔		Associates up to 10 OPC tags or expressions with each alarm tag as “supplemental” information to the alarm.
SP	✔				VT_SP	Setpoint (OPC Input 2)

OPC Data Access Interface

The AlarmWorX Server exposes much of its real-time and configuration data via the OPC Data Access specification. This allows OPC Data Access client applications, such as GraphWorX, to make use of alarm-related data without using the OPC Alarm & Events interface. Some typical uses would include:

- Changing the color of a graphic symbol to correspond to alarm state.
- Displaying alarm limits.
- Allowing alarm limits to be changed by the operator.

The following table lists the OPC item names that are available from the server. The values in the table indicated as Read/Write (R/W) can be changed via the OPC Data Access Interface. Any changes made to the server this way are transient, and not stored to the database. If the server is shut down, these values will be lost.

OPC Data Access Items

ITEM NAME	TYPE	R/W	COMMENT
Active	VT_BOOL	R	Tag's Global Alarm Active Bit.
Name	VT_BSTR	R	Tag Name (Source).
Input1	VT_BSTR	R	
BaseText	VT_BSTR	R	
Enabled	VT_BOOL	R	Enabled state of the Source (tag).
HelpText	VT_BSTR	R	
LIM_RTNText	VT_BSTR	R	
LIM_Input2	VT_R8	R	
LIM_Deadband	VT_R8	R	
LIM_Active	VT_BOOL	R	
LIM_Acked	VT_BOOL	R/W	
LIM_HIHI_Active	VT_BOOL	R	
LIM_HIHI_Enabled	VT_BOOL	R/W	
LIM_HIHI_RequiresAck	VT_BOOL	R/W	
LIM_HIHI_Severity	VT_R8	R/W	
LIM_HIHI_Limit	VT_R8	R/W	
LIM_HIHI_MsgText	VT_BSTR	R/W	
LIM_HI_Active	VT_BOOL	R	
LIM_HI_Enabled	VT_BOOL	R/W	
LIM_HI_RequiresAck	VT_BOOL	R/W	
LIM_HI_Severity	VT_R8	R/W	
LIM_HI_Limit	VT_R8	R/W	
LIM_HI_MsgText	VT_BSTR	R/W	
LIM_LOLO_Active	VT_BOOL	R	
LIM_LOLO_Enabled	VT_BOOL	R/W	
LIM_LOLO_RequiresAck	VT_BOOL	R/W	
LIM_LOLO_Severity	VT_R8	R/W	
LIM_LOLO_Limit	VT_R8	R/W	
LIM_LOLO_MsgText	VT_BSTR	R/W	
LIM_LO_Active	VT_BOOL	R	
LIM_LO_Enabled	VT_BOOL	R/W	
LIM_LO_RequiresAck	VT_BOOL	R/W	
LIM_LO_Severity	VT_R8	R/W	
LIM_LO_Limit	VT_R8	R/W	
LIM_LO_MsgText	VT_BSTR	R/W	
DEV_RTNText	VT_BSTR	R	
DEV_Input2	VT_R8	R	
DEV_Deadband	VT_R8	R	
DEV_Active	VT_BOOL	R	
DEV_Acked	VT_BOOL	R/W	
DEV_HIHI_Enabled	VT_BOOL	R/W	
DEV_HIHI_RequiresAck	VT_BOOL	R/W	
DEV_HIHI_Severity	VT_R8	R/W	
DEV_HIHI_Limit	VT_R8	R/W	
DEV_HIHI_MsgText	VT_BSTR	R/W	

ITEM NAME	TYPE	R/W	COMMENT
DEV_HI_Enabled	VT_BOOL	R/W	
DEV_HI_RequiresAck	VT_BOOL	R/W	
DEV_HI_Severity	VT_R8	R/W	
DEV_HI_Limit	VT_R8	R/W	
DEV_HI_MsgText	VT_BSTR	R/W	
DEV_LOLO_Enabled	VT_BOOL	R/W	
DEV_LOLO_RequiresAck	VT_BOOL	R/W	
DEV_LOLO_Severity	VT_R8	R/W	
DEV_LOLO_Limit	VT_R8	R/W	
DEV_LOLO_MsgText	VT_BSTR	R/W	
DEV_LO_Enabled	VT_BOOL	R/W	
DEV_LO_RequiresAck	VT_BOOL	R/W	
DEV_LO_Severity	VT_R8	R/W	
DEV_LO_Limit	VT_R8	R/W	
DEV_LO_MsgText	VT_BSTR	R/W	
DIG_RTNText	VT_R8	R	
DIG_Input2	VT_R8	R	
DIG_Active	VT_BOOL	R	
DIG_Acked	VT_BOOL	R/W	
DIG_Enabled	VT_BOOL	R/W	
DIG_RequiresAck	VT_BOOL	R/W	
DIG_Severity	VT_R8	R/W	
DIG_Limit	VT_R8	R/W	
DIG_MsgText	VT_BSTR	R/W	
ROC_RTNText	VT_BSTR	R	
ROC_Input2	VT_R8	R	
ROC_Active	VT_BOOL	R	
ROC_Acked	VT_BOOL	R/W	
ROC_Enabled	VT_BOOL	R/W	
ROC_RequiresAck	VT_BOOL	R/W	
ROC_Severity	VT_R8	R/W	
ROC_Limit	VT_R8	R/W	
ROC_MsgText	VT_BSTR	R/W	
LIM_HIHI_Active	VT_BOOL	R	
LIM_HI_Active	VT_BOOL	R	
LIM_LOLO_Active	VT_BOOL	R	
LIM_LO_Active	VT_BOOL	R	
DEV_HIHI_Active	VT_BOOL	R	
DEV_HI_Active	VT_BOOL	R	
DEV_LOLO_Active	VT_BOOL	R	
DEV_LO_Active	VT_BOOL	R	

Error Reporting

Internal errors encountered by the AlarmWorX Sever are reported via the SMAR Event Server, another OPC Alarm & Events compliant server. The SMAR Event Server can optionally write selected events to the NT Event Log. The following simple events may be generated by the AlarmWorX Server: For the SMAR Event Server, severity values of 600 and below are considered "normal," and severity values of 601 to 1000 are considered errors.

Server Errors

Severity	Message
500	"%1 %2 Started."
500	"%1 %2 Stopped."
700	"Alarm Tag: %1, Condition: %2, Input Item: %3, Error: Unknown"
700	"Alarm Tag: %1, Condition: %2, Input Item: %3, Error: Tag does not exist."
700	"Alarm Tag: %1, Condition: %2, Input Item: %3, Error: Rejected by Security Server."
700	"Alarm Tag: %1, Condition: %2, Input Item: %3, Error: Licensed I/O Point Count Exceeded. "
700	"Alarm Tag: %1, Condition: %2, Input Item: %3, Error: Demo mode has timed out."
700	"Alarm Tag: %1, Condition: %2, Input Item: %3, Error: Local I/O not allowed on Browser node."
700	"Alarm Tag: %1, Condition: %2, Input Item: %3, Error: COM error registering with GenRegistrar."
800	"%1 %2 Failed to Register with GenRegistrar. Reason: %3"
800	"No configuration found for node and no ""Default"" configuration in Database Provider: %1 Connection: %2"
800	"Database Error - Provider: %1 Connection: %2"

Using a technology that has been incorporated into all Smar products, TraceWorX provides online diagnostics and tuning of applications running in the ProcessView system. TraceWorX is designed expressly for systems integrators, OEMs and customers who want to have tools for doing their own troubleshooting and diagnostics.

TraceWorX tracks the runtime activity for each ProcessView application and logs the runtime data to a log file based on user-configured trace levels. The log file provides a thorough, color-coded report detailing all activity for the application, including the time, the date, the severity level, and a description of the event or problem.

TraceWorX32 also features several options for reporting issues to technical support. If you are experiencing problems with any applications, the log file deployment options, such as compressing and e-mailing log files, are ideal for tracking and archiving data and sending detailed reports to technical support. Developers can use these reports to identify the source of the problems.

For information about TraceWorX, please see the TraceWorX Help documentation.

Chapter 6

Viewer ActiveX

Introduction

The AlarmWorX Current Events Viewer is an OPC ActiveX client application that provides real-time alarm information within the ProcessView product family. It communicates to OPC Alarm and Events servers to provide excellent alarming features. It is important to note that this is a Current Events Viewer, which means that it only displays active alarms and current operator messages.

The structure of the AlarmWorX Current Events Viewer is built on a three-level system, consisting of Default settings (color, font, justification, wrapping method and size), Row types (color and font) and Column values (color, font, justification, wrapping method and size). Each system starts with certain default settings, which can be overwritten by row settings, which in turn can be overwritten by column settings.

Using the AlarmWorX Viewer ActiveX

The AlarmWorX Viewer ActiveX integrates easily within Microsoft Visual C++ or Microsoft Visual Basic (VB) container applications. The Smar ProcessView containers, such as GraphWorX, provide toolbar support for inserting the AlarmWorX Viewer ActiveX. Once inserted into a document or a form, the component can be resized and configured.

Within the Smar ProcessView containers and in Visual Basic forms, the component is initially placed in **Configuration** mode, where its user interface is disabled and you can configure the AlarmWorX Viewer ActiveX through the **Properties** dialog box. Once the application is committed to **Runtime** mode, the viewer will automatically connect to alarm and event OPC servers, query for a complete update of all requested alarms and display current alarm messages. The AlarmWorX Viewer ActiveX has the option of saving file information as part of the container or in its own file format.

You must give a valid filename, if saving to a file, before the data are serialized and saved. The AlarmWorX Viewer uses the concept of a **Working Directory,** defined in the Smar ProcessView containers. This represents the working directory where project files and configuration files will be stored. The AlarmWorX Viewer will utilize this directory as a starting point for saving and loading its configuration files.

Connections

The AlarmWorX Viewer can display data from any OPC Alarm and Event server. Alarm subscription filters are made through the **Subscription** tab of the **Properties** dialog box.

Once a subscription is set up, the viewer requests a refresh of all current alarms upon animation. Alarms are sent by the OPC Alarm and Event server on an alarm-by-alarm basis. This decreases the number of alarms sent to each viewer and allows for server-side filtering.

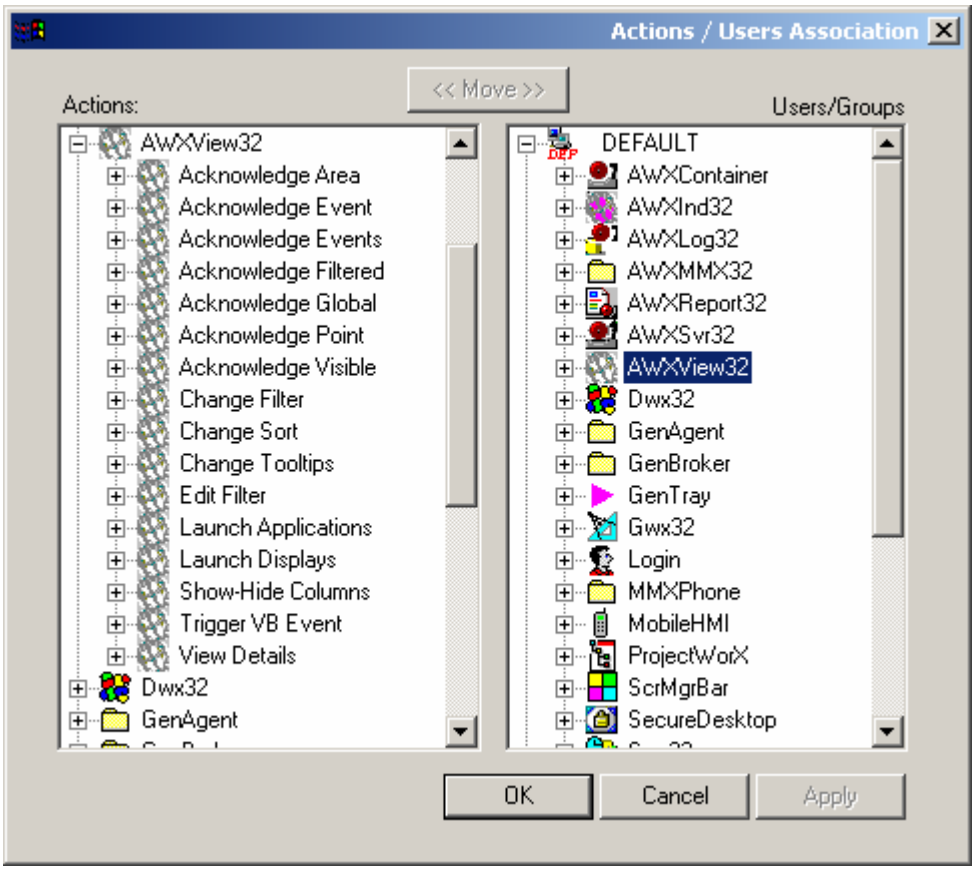
Security

To access the Smar Security Server from the AlarmWorX Container, either select **Security > Configuration** from the **Tools** menu or click the **Security** button on the toolbar. This opens the **Security Server Administrator Login** dialog box, as shown in the figure below.

Security Server Login

Enter your **User Name** and **Password,** and then click **OK.** This opens the SMAR Security Server, where you can access the **AWXView** Security Server. Depending on your configured level of security, you may or may not be able to edit components of the **AWXView** Security Server. Choose **Application Actions from the Edit menu.** The **Actions/Users Association** dialog box appears, as shown in the figure below.

Note: For more information about security, please see the Security Configurator help documentation.



AlarmWorX Viewer ActiveX Actions Protected by Security

The Security Server can be set up to allow access to several different actions from this dialog. To set the options for the AlarmWorX Viewer, select **AWXView32** from the list, as shown in the figure above. This opens the list in the left pane, which includes the following options:

- Acknowledge Area
- Acknowledge Event
- Acknowledge Events
- Acknowledge Filtered
- Acknowledge Global
- Acknowledge Point
- Acknowledge Visible
- Change Filter
- Change Language
- Change Sort
- Change ToolTips
- Edit Filter
- Configure Property Pages
- Launch Applications
- Launch Displays
- Show - Hide Columns
- Trigger VB Event
- View Details

Language-Aliasing Support

The AlarmWorX Viewer ActiveX component has all of its strings saved in the resource file, which can be modified to provide custom versions. In addition, it provides real-time support for loading a resource-only .dll to support an international language. This .dll file is compiled as a standard Win32 .dll, and it is made up of all the resources and the .odl file of the AlarmWorX Viewer module. Any time the SMAR applications settings are switched to a different language, AlarmWorX Viewer will load the corresponding resource .dll.

The resource-only .dll file name uses the AlarmWorX Viewer component, followed by the three characters used in Microsoft Windows NT as the abbreviation for a language name (e.g., the abbreviation "deu" stands for German, and the .dll should be named "AWXView_deu.dll"). In addition, using the OLE Automation property language ID, you can control this functionality through OLE Automation.

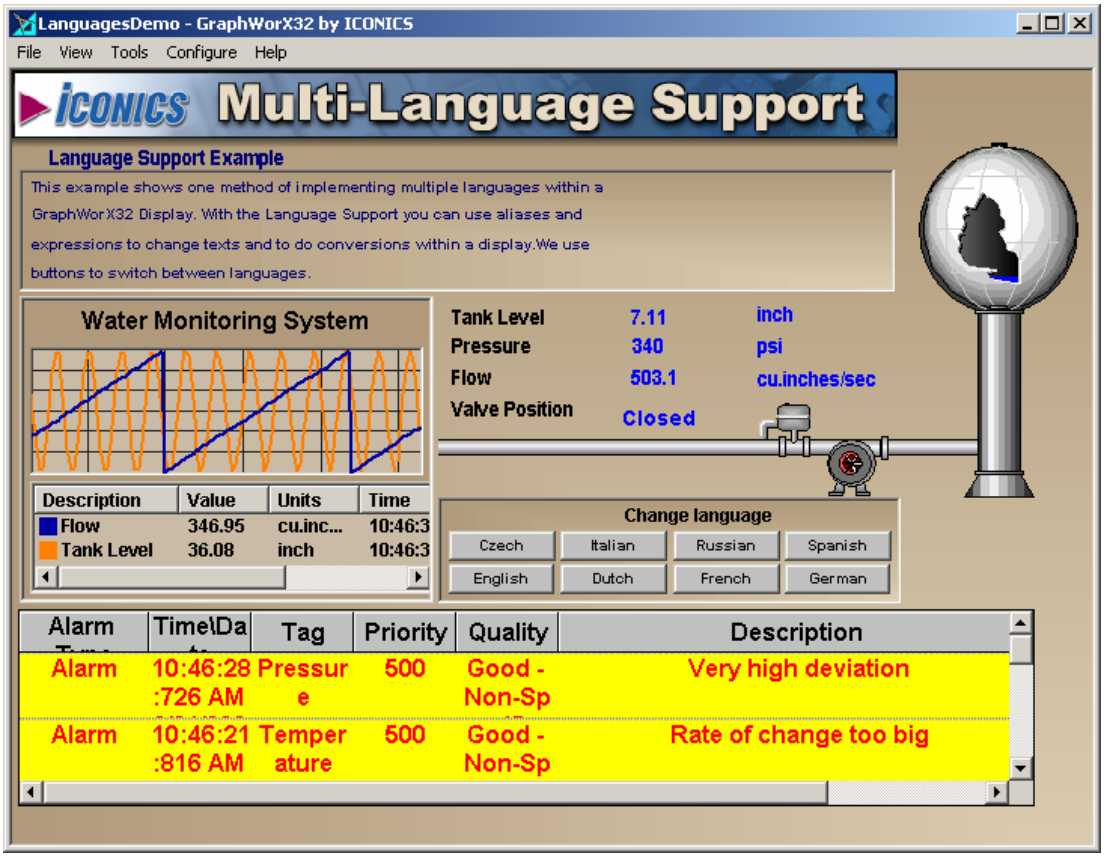
The Unicode version of the AlarmWorX Viewer ActiveX also supports language aliasing with automatic range and value scaling, as well as unit conversions, formatting, and font selection. For more information about configuring Unicode version language-aliasing support, refer to the ProcessView **Language Configurator** documentation.

Note: The AlarmWorX Viewer requires the following additional language-aliasing configuration work. If any expression is to be used for range, alarm limits, and or unit scaling, you need to define both a "Read Expression" and a "Write Expression" in the Language Configurator. By doing so, the Viewer will be able to function properly between language switches.

Note: To enhance language-aliasing performance, select the Microsoft Arial Unicode font, which contains all Unicode characters. The Arial Unicode MS font must be selected separately within the **Properties** dialog boxes of each ActiveX component.

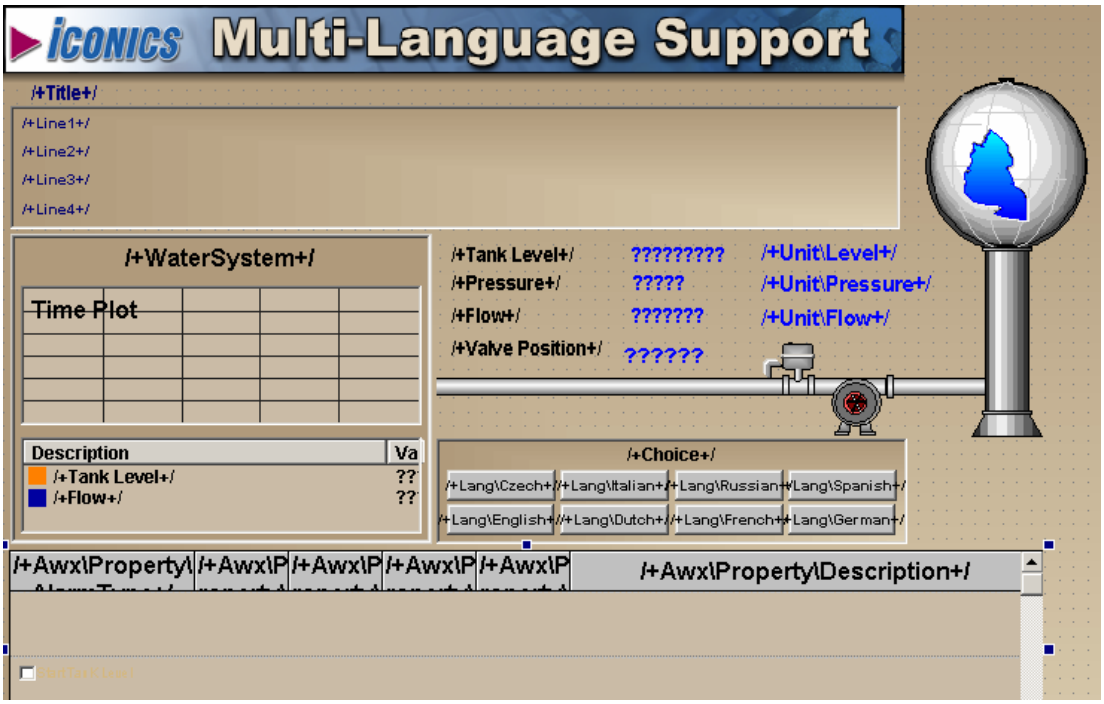
Sample Language Configuration

The Unicode Installation of ProcessView provides a sample Language Server configuration under the "Languages" folder of the ProcessView product installation "tree." In addition, a sample display "languagesDemo.gdf," which includes a sample Viewer configuration, is provided under the ProcViewDEMO folder. The figure below shows this sample during runtime mode. Notice that you can switch between languages in this display by simply clicking the buttons in the Change Language field.



Language-Aliasing Demo in Runtime Mode

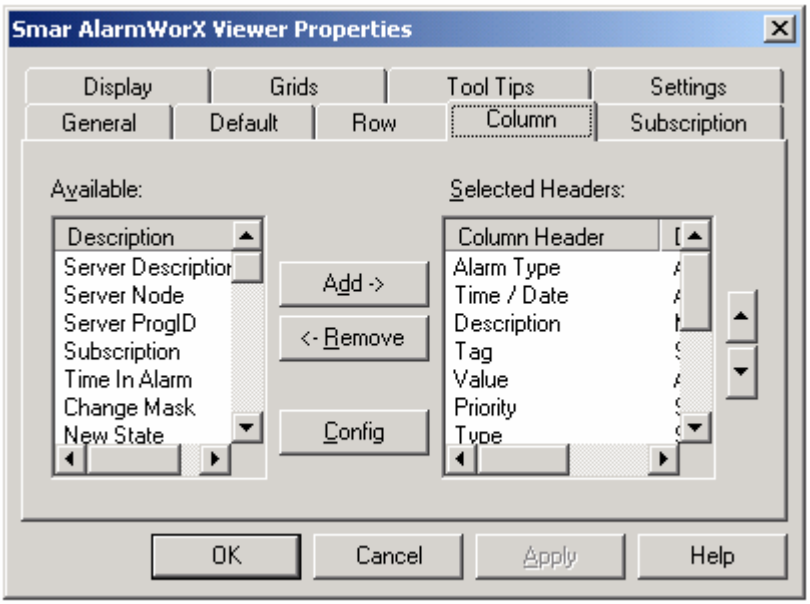
The figure below shows this same language-aliasing demo in configuration mode. This display incorporates ActiveX objects from GraphWorX, TrendWorX, and AlarmWorX.



Language-Aliasing Demo in Configuration Mode

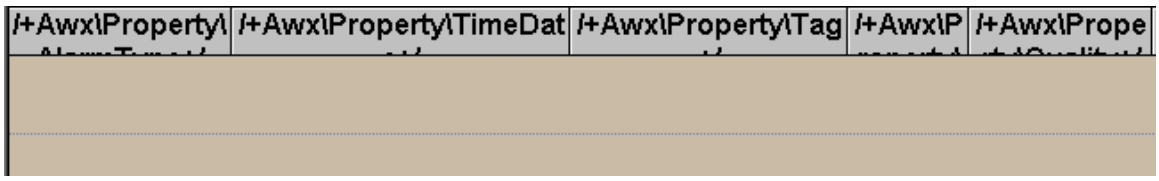
For example, if you click on the Alarm Viewer ActiveX in the language-aliasing configuration shown above, you can view the properties of the Alarm Viewer Active X, as shown in the figure below. The

Column tab of the **Alarm Viewer ActiveX Properties** dialog box, shown below, displays the language-aliasing configuration of the headers in the Alarm Viewer.



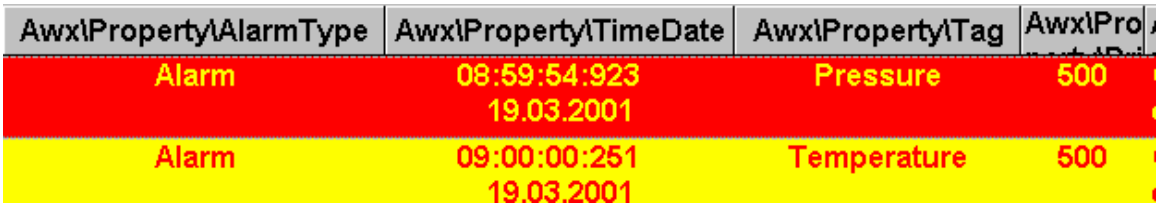
Alarm Viewer ActiveX Properties: Column Tab

For the example above, the Alarm Viewer configuration appears as shown in the figure below. Note that the strings within a "/+" and "+/" delimiter pair define a language-aliased string. As you can see, each header in the Alarm Viewer configuration is a language-aliased string that contains these delimiters.



Language-Aliased Alarm Viewer Display in Configuration Mode

During animation (runtime) mode, the Viewer ActiveX will interface to the Language Server, and it will try to resolve the language-aliased strings. If successful, it will display the translated strings in the Alarm Viewer display, as shown below. In addition, if the **Units** language alias string has an equation defined in the Language Configurator, it will autoscale the values based on the scaling equation supplied by the Language Server.



Language-Aliased Alarm Viewer Display in Runtime Mode

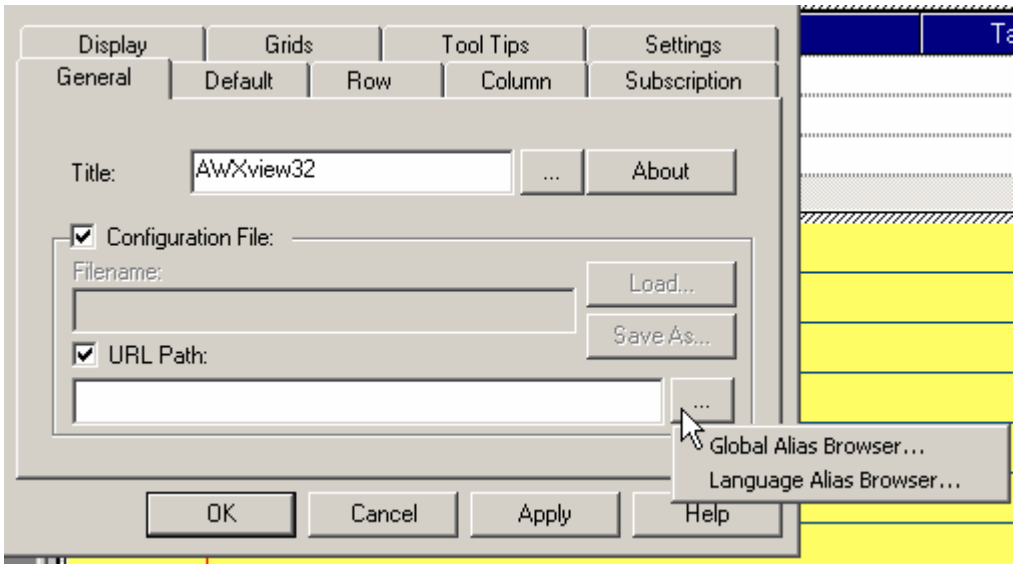
Note: The Unicode version language aliasing is independent of the resource .dll selection, which relates mostly to the text in the dialog boxes and other user interface elements.

Language Alias Browser

When specifying a language alias in the **Alarm Viewer ActiveX Properties** dialog box, you can also select a language alias from the **Language Alias Browser,** which includes all language aliases in the language database. This eliminates the need to manually type in the alias name. Clicking the **...** button and selecting **Language Alias Browser** from the pop-up menu opens the Language Alias Browser, as shown in the figure below. The Language Alias Browser is available for the following:

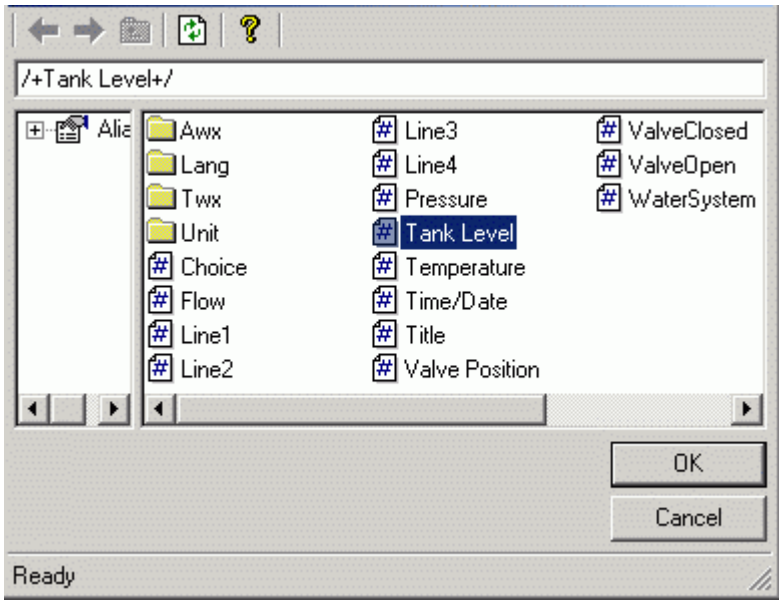
- **Configuration file** and **URL Path** sections of the **Alarm Viewer ActiveX Properties** dialog box **General** tab

- Alarm filtering via the Expression Editor
- **Event Subscriptions** dialog box: **Server, Areas,** and **Sources**



Opening the Language Alias Browser in the Viewer Properties

The browser, shown in the figure below, includes all languages aliases in the language database. All language aliases that are configured in the Language Configurator are conveniently available to choose from inside the browser. The tree control of the Language Configurator is mimicked in the tree control of the Language Alias Browser. Select a language alias by double-clicking the alias name. The alias name appears at the top of the browser, which automatically adds the /+ and +/ delimiters to the alias name. Click the **OK** button.



Selecting an Alias From the Language Alias Browser

Global-Aliasing Support

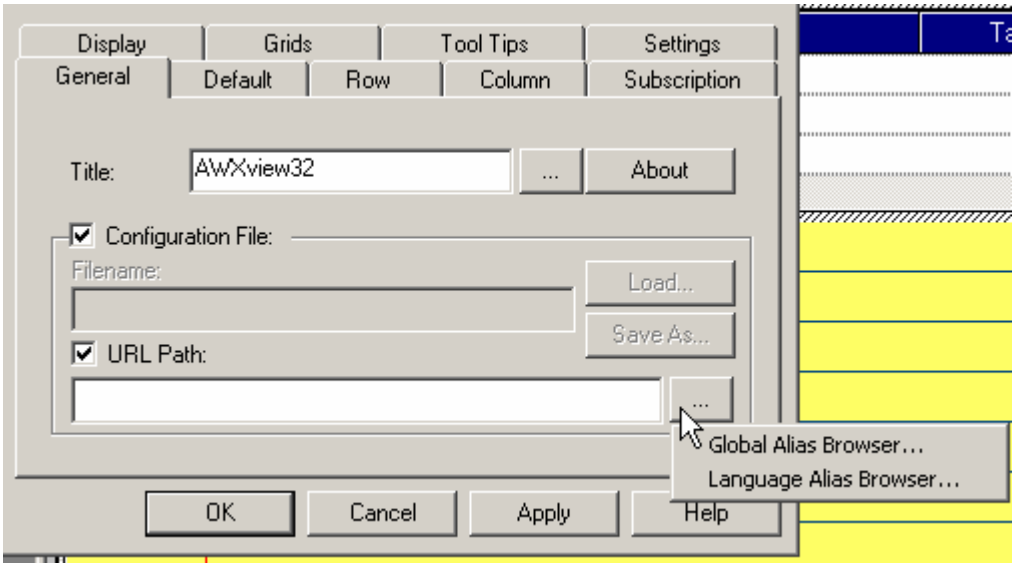
The AlarmWorX Viewer ActiveX supports Global Aliasing by interfacing to the SMAR Global Aliasing System (GAS) Engine Server.

Currently the AlarmWorX Viewer supports machine-level and process-level aliasing. All fields that support aliasing have been interfaced to the Global Alias Browser dialog, which is evoked by clicking on the **...** button in the configuration.

In addition, the AlarmWorX Viewer now has an integrated Global Alias Browser.

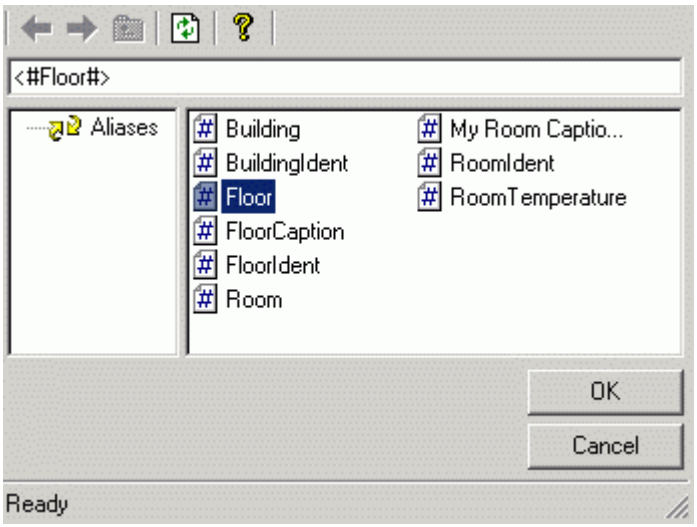
When specifying a global alias in the **Alarm Viewer ActiveX Properties** dialog box, you can also select a global alias from the **Global Alias Browser,** which includes all global aliases in the Global Aliasing System database. This eliminates the need to manually type in the alias name. Clicking the **...** button and selecting **Global Alias Browser** from the pop-up menu opens the Global Alias Browser, as shown in the figure below. The Global Alias Browser is available for the following:

- **Title, Configuration file** and **URL Path** sections of the **Alarm Viewer ActiveX Properties** dialog box **General** tab
- Alarm filtering via the Expression Editor
- **Event Subscriptions** dialog box: **Server, Areas,** and **Sources**



Opening the Global Alias Browser in the Viewer Properties

All global aliases that are configured in the Global Alias Engine Configurator are conveniently available to choose from inside the browser. The tree control of the Global Alias Engine Configurator is mimicked in the tree control of the Global Alias Browser. Select a global alias by double-clicking the alias name (e.g. "Floor" in the figure below). The alias name appears at the top of the browser, which automatically adds the <# and #> delimiters to the alias name. Click the **OK** button.

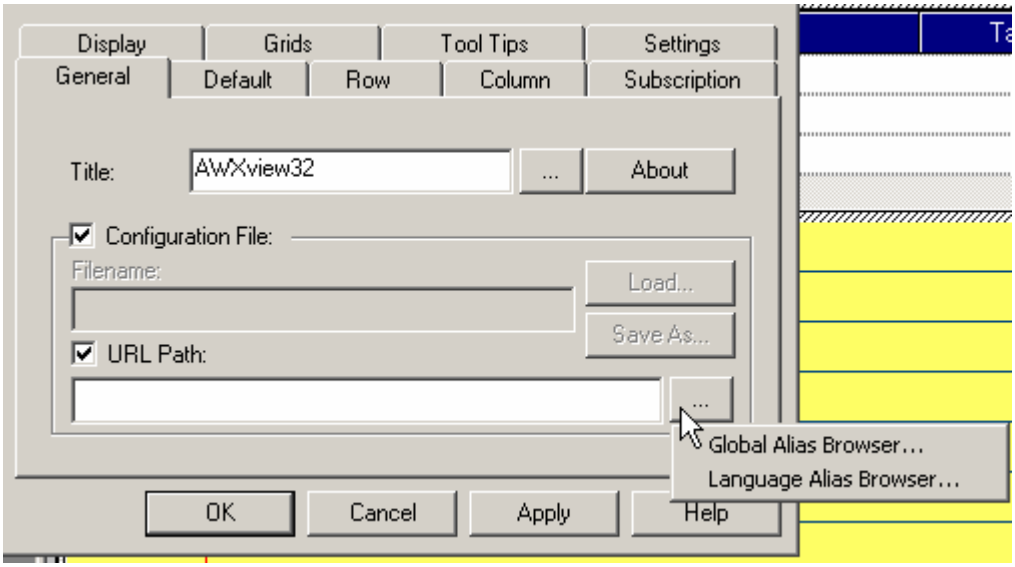


Selecting an Alias From the Global Alias Browser

Asynchronous Downloading features

The AlarmWorX Viewer supports asynchronous downloading of configuration data when used inside SMAR ActiveX document servers, such as GraphWorX, to produce documents, which can be viewed using Microsoft Internet Explorer.

To enable this feature, select **URL Path** from the **General** tab of the **Alarm Viewer ActiveX Properties** dialog box, shown below, and supply a URL path. In the case of viewing ActiveX documents within an Intranet setup, you can supply a server name and directory specifying the location of the AlarmWorX Viewer configuration data (must be a shared directory), by using the convention "file:\\Server Name\Directory\File Name.awv."



Alarm Viewer ActiveX Properties: General Tab

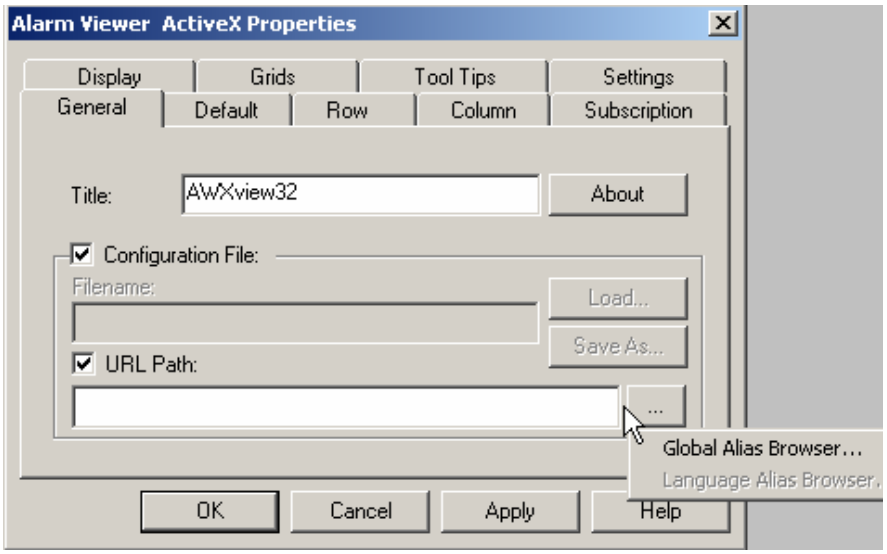
User Interface

This section describes the user interface for the AlarmWorX Viewer ActiveX.

Properties Dialog

The **Alarm Viewer ActiveX Properties** dialog box, shown below, is the user configuration interface for the ActiveX. When embedded in an ActiveX container, double-clicking anywhere in the ActiveX client opens the **Properties** dialog box.

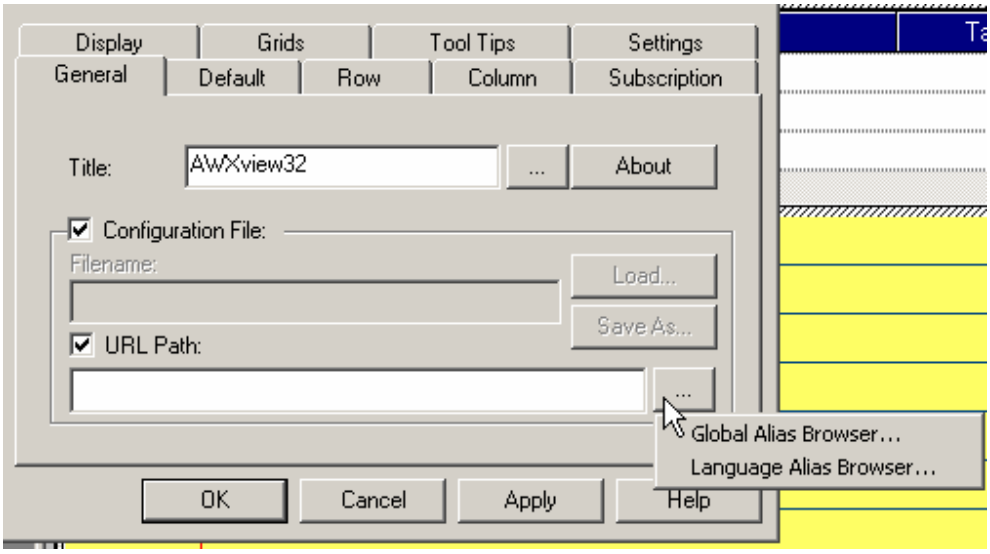
Note: Right-clicking on the Viewer ActiveX and selecting Properties also opens the **Alarm Viewer ActiveX Properties** dialog box.



Alarm Viewer ActiveX Properties Dialog Box

General

The **General** tab of the **Alarm Viewer ActiveX Properties** dialog box, shown below, allows you to specify the name of the viewer file. By default, information is stored as part of the container application's document file.



Alarm Viewer ActiveX Properties: General Tab

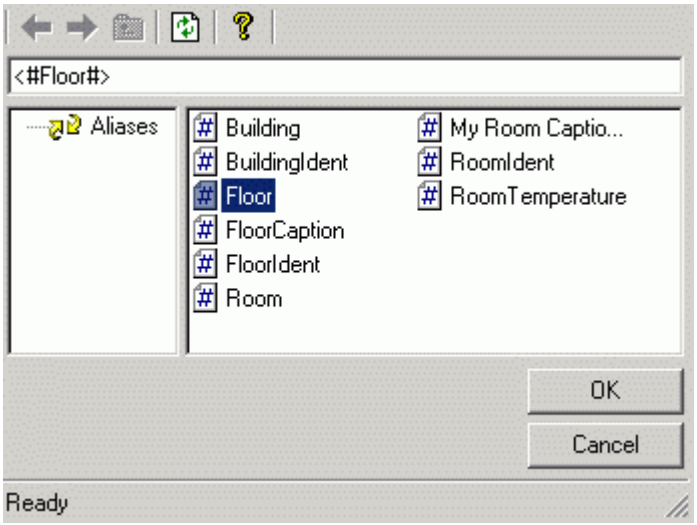
Configure the following **General** tab settings:

- **Title:** Enter a title for the viewer.
- **About:** Clicking the **About** button displays both technical support information and the SMAR About Box, which contains registration and serial number information as well as system resource information, such as memory and disk space available.
- **Configuration File:** By default, information is stored as part of the container application's document file. You can also store information as part of a separate (.awv) file. To save the .awv file, click **Save As** to open the **Save AWXView32 File** dialog box. Enter a name for the .awv file in the **File Name** field, and then click **Save.**

You can also open an existing configuration file by clicking the **Load** button on the **General** tab and browsing for the file. If **Configuration File** is selected, the Viewer ActiveX will attempt to load from the file listed under **File name.** If **URL Path** is checked, the ActiveX will use the specified network URL path upon loading the file.

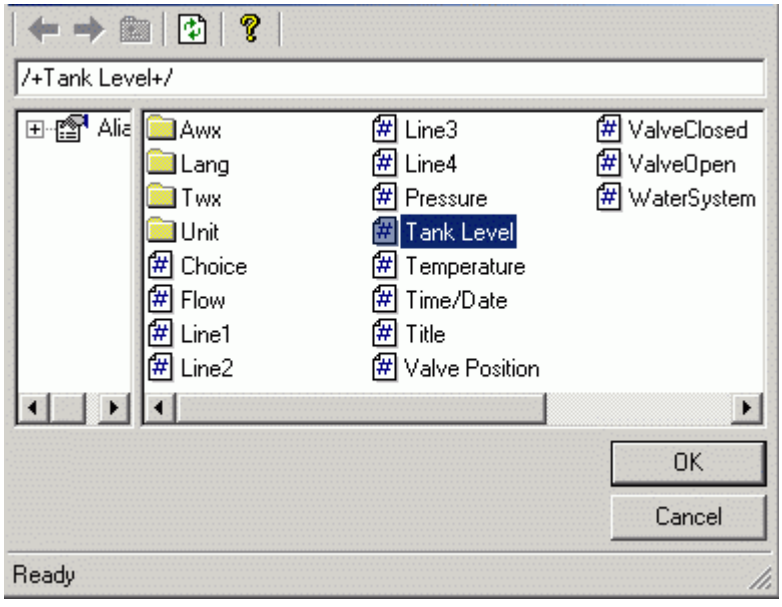
Note: The ActiveX cannot be saved to a URL path. To create a URL file, save a report configuration to a local file and copy the file to the desired network location.

You can also select aliases to use for the configuration file. Clicking the **...** button and selecting **Global Alias Browser** from the pop-up menu opens the Global Alias Browser, as shown in the figure below. Select a global alias from the Global Alias Browser, which includes all global aliases in the global alias database. This eliminates the need to manually type in the alias name. All global aliases that are configured in the Global Alias Engine Configurator are conveniently available to choose from inside the browser. The tree control of the Global Alias Engine Configurator is mimicked in the tree control of the Global Alias Browser. Select a global alias by double-clicking the alias name (e.g. "Floor" in the figure below). The alias name appears at the top of the browser, which automatically adds the <# and #> delimiters to the alias name. Click the **OK** button.



Selecting an Alias From the Global Alias Browser

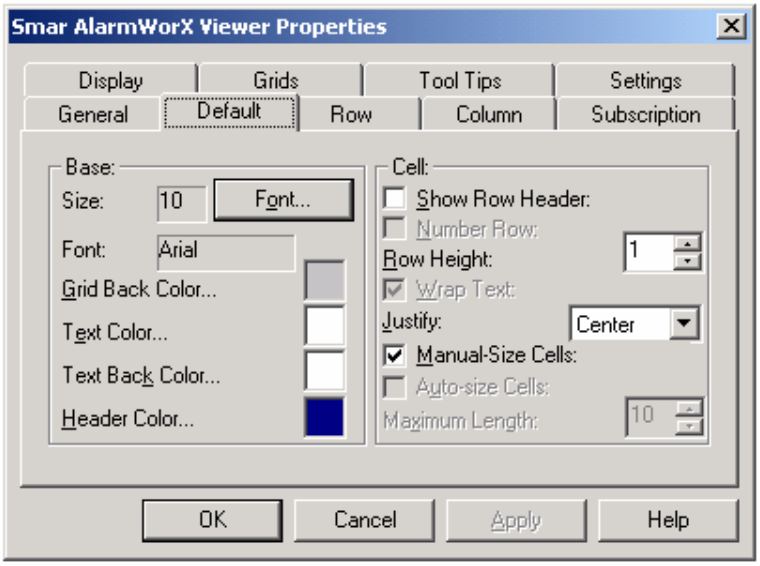
Clicking the **...** button and selecting **Language Alias Browser** from the pop-up menu opens the Language Alias Browser, as shown in the figure below. The browser includes all languages aliases in the language database. All language aliases that are configured in the Language Configurator are conveniently available to choose from inside the browser. The tree control of the Language Configurator is mimicked in the tree control of the Language Alias Browser. Select a language alias by double-clicking the alias name. The alias name appears at the top of the browser, which automatically adds the /+ and +/ delimiters to the alias name. Click the **OK** button.



Selecting an Alias From the Language Alias Browser

Default

The **Default** tab of the **Alarm Viewer ActiveX Properties** dialog box, shown below, configures the appearance of the AlarmWorX Viewer ActiveX.

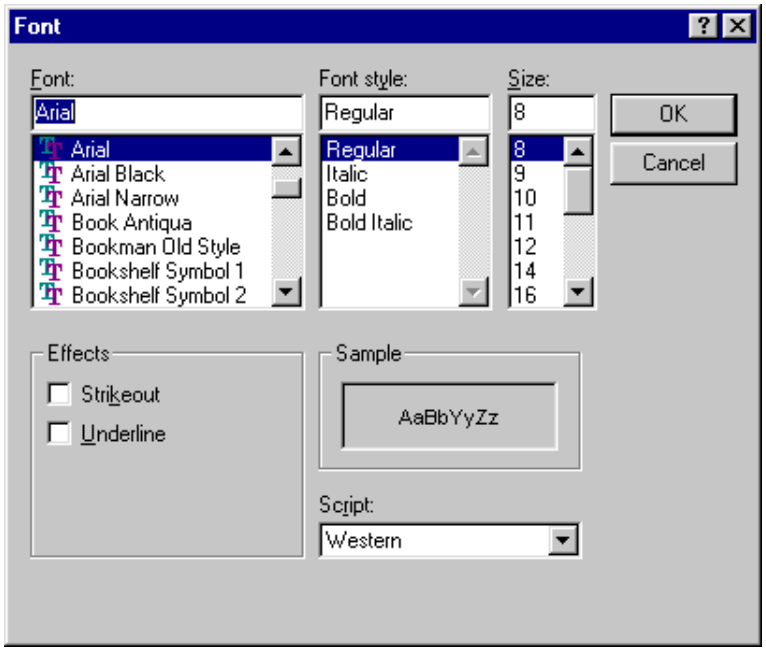


Alarm Viewer ActiveX Properties: Default Tab

Color, Font and Style

The colors section allows you to choose colors for the background of the display, the background color of the text, the background color of the header and the base foreground text color. Under the **Base** field, select a **Grid Back Color, Text Color, Text Back Color,** and **Header Color** by clicking the color palette. A **Color** box appears, allowing you to choose a preconfigured color or to create your own color using the **Define Custom Colors** button.

Click the **Font** button to specify the font size, style, and text effects (i.e. underline and strikethrough) for the alarm viewer.



Selecting a Font Style for the Viewer

Cell

The **Cell** section sets the default options to apply to the cells of the viewer. Checking **Show Row Header** causes a row header to be displayed in the viewer. Checking **Show Row Header** also enables the **Number Row** option, but it is not necessary to have both of these options checked. Checking **Number Row** causes the row header to number each row line. If the **Number Row** option is not checked, then the row headers will be blank. The **Row Height** field sets the height of the rows in the viewer.

Note: The **Row Height** must be a positive integer between 1 and 10.

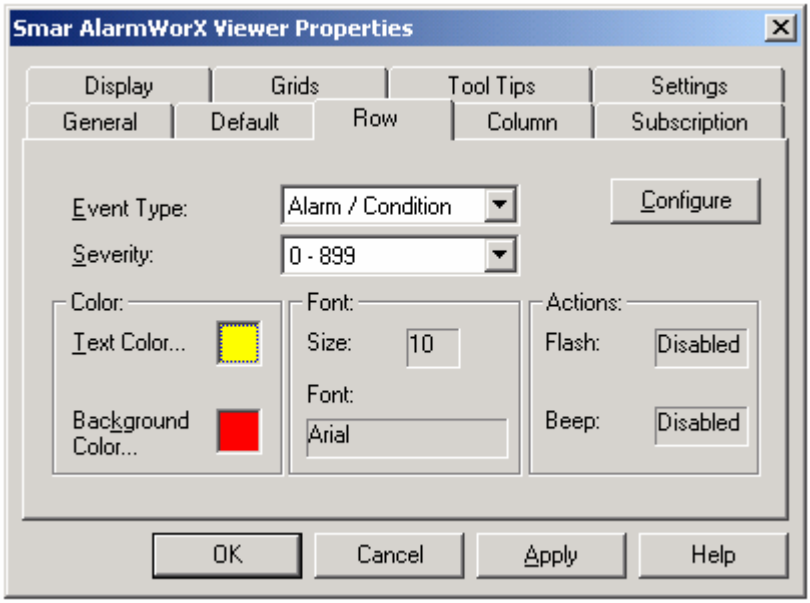
Checking **Wrap Text** box makes the text wrap when it hits the end of the particular cell. When this option is not applied, text will continue in one line although only part of the text will be visible, depending on the size of the cell. Please note that the **Wrap Text** feature is available only with multi-line rows. The **Justify** field determines the justification (left, center or right) of the text within each cell.

There are three options for determining the size of each cell:

- **Manual-Size Cells:** Checking this box allows you to manually set the width of each column. Manual sizing of columns can only be done during runtime.
- **Auto-Size Cells:** When this box is checked, the viewer automatically sets the width of each column. The viewer automatically sets each column to the width nearest to the size of the ActiveX divided by the number of visible columns.
- **Maximum Length for Each Cell:** Currently this is a range from 1 to 1000, and it applies the maximum cell length to all cells.

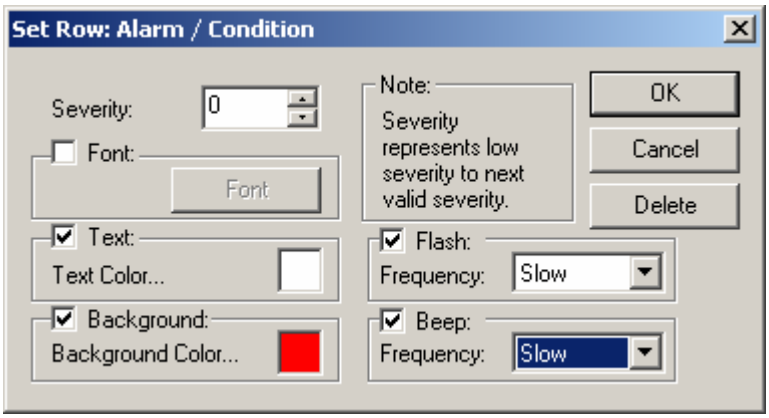
Row

The **Row** tab of the **Alarm Viewer ActiveX Properties** dialog box, shown below, sets the color of the text and background for different event types.



Alarm Viewer ActiveX Properties: Row Tab

Use the **Event Type** drop-down list to select the event type you wish to configure. It is possible to have several different configurations for one event type. To configure an event type, simply click the **Configure** button or click either the **Text Color** or **Background Color** box. This opens the **Set Row** dialog box, as shown in the figure below.



Setting Row Properties for the Alarm/Condition

The **Severity** field sets the lower bound for this particular configuration. This lower bound represents the point at which the viewer will begin to override the current values for text color, background color, and font with the values set in this dialog.

Note: The new height will be resized based on the size of the font selected.

Through this method, it is possible to set up ranges. For example, configuring a severity of 300 with a text color of purple and another severity of 600 with a text color of green would result in a purple range from 300 to 599.

This dialog can also be used to delete a configuration. To delete a configuration, select the lower bound severity of the configuration you wish to delete and click the **Delete** button.

Note: The default severity value '0' cannot be deleted.

Once you have made all desired edits for a particular configuration click, **OK** to save the edits and exit the dialog, or click **Cancel** to exit the dialog without saving any changes. All available configurations can be accessed through the **Severity** drop-down list.

Flash/Beep

Selecting the **Flash** and/or **Beep** check boxes applies the flash or beep to the particular severity. Once the box has been checked, you can set a frequency for the occurrence of the flash or beep (slow, medium, or fast). This frequency will be displayed in the **Actions** section on the **Row** tab.

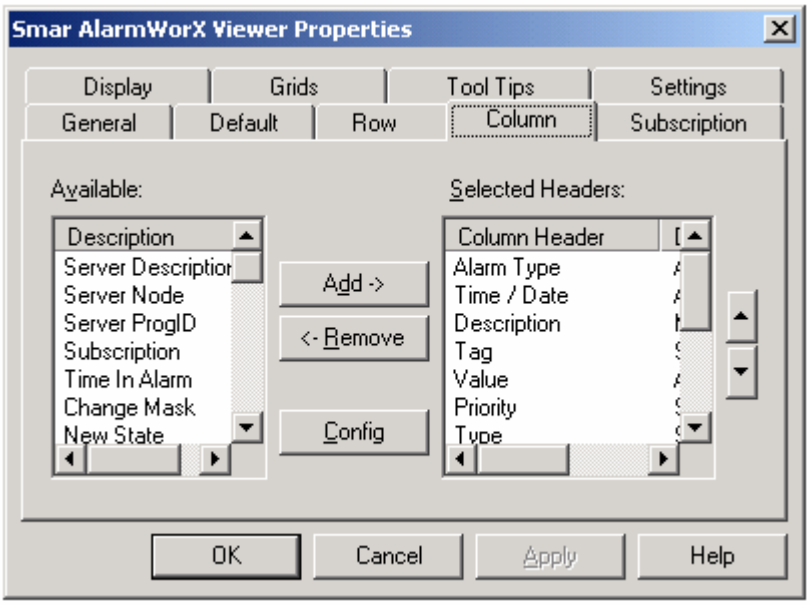
The **Flash/Beep** functionality can be activated on the **Row - Configure** dialog.

It is possible to change the default beep to a *.wav file by accessing **Settings > Control Panel > Sounds > Default Sound**. Please note that if you choose a large file as your default sound, your system may experience difficulty when trying to load it.

The **Flash** option simply inverts the text and background color to indicate the flashing.

Column

The **Column** tab of the **Alarm Viewer ActiveX Properties** dialog box, shown below, allows you to select which columns you want to appear in the viewer.



Alarm Viewer ActiveX Properties: Column Tab

By clicking the **Add** and **Remove** buttons in the middle of and the "up" and "down" arrows on the right side of this the **Column** tab, you can select which columns to include in the report as well as indicate the order of their appearance. To move an item from the **Available** list to the **Selected** list, simply highlight the item and click the **Add** button. To move an item back from the **Selected** list to the **Available** list, highlight the item and click the **Remove** button. To change the order of an item in the **Selected** list, simply select the item and click the "up" and "down" arrows located on the right-hand side.

Column Types

The available column types are listed in the table below.

Note: The following column type descriptions are taken directly from the OPC Alarms and Events Specifications. Please refer to the Specifications for complete information.

COLUMN TYPE	DESCRIPTION
	The following items are present for all event types.
Source	The source of event notification. This Source can be used in the IOPCEventServer::TranslateToItemIDs method to determine any related OPC Data Access itemIDs.
Time	Time of the event occurrence. For conditions, time that the condition transitioned into the new state or sub-condition. For example, if the event notification is for acknowledgment of a condition, this would be the time that the condition became acknowledged.
Active Time	Array of active times corresponding to each Source and ConditionName pair. This parameter uniquely identifies a specific transition of the condition to the active state or into a different sub-condition and is the same as the SubCondLastActive condition attribute. Active times are passed to the client in the ActiveTime member of the ONEVENTSTRUCT by the IOPCEventSink::OnEvent callback. If the condition has become active again or transitioned into a different sub-condition at a later time, this acknowledgment will be ignored.
Message	Event notification message describing the event.
Subscription	Subscription to a given OPC Alarm and Event server.
Server Description	Information about the currently subscribed OPC Alarm and Event server.
Server Node	Node (computer) on which the currently subscribed OPC Alarm and Event server is located.
Event Type	OPC_SIMPLE_EVENT, OPC_CONDITION_EVENT, or OPC_TRACKING_EVENT for Simple, Condition-Related, or Tracking events, respectively.
Event Category	Event categories define groupings of events supported by an OPC Event server. Examples of event categories might include “Process Events”, “System Events”, or “Batch Events”. Event categories may be defined for all event types, i.e. Simple, Tracking, and Condition-Related. However, a particular event category can include events of only one type. A given Source may generate events for multiple event categories. Names of event categories must be unique within the event server. The definition of event

COLUMN TYPE	DESCRIPTION
	The following items are present for all event types.
	categories is server-specific.
Severity	Event severity (0-1000). The severity value is an indication of the urgency of the sub-condition. This is also commonly called 'priority', especially in relation to process alarms. Values will range from 1 to 1000, with 1 being the lowest severity and 1000 being the highest. Typically, a severity of 1 would indicate in event that is informational in nature, while a value of 1000 would indicate an event of catastrophic nature which could potentially result in severe financial loss or loss of life.
Number Event Attributes	The length of the specific event attribute array.
Attributes 1-20	User-specified event attributes.
	The following items are present only for condition-related events.
Condition Name	The name of the condition related to this event notification.
SubCondition Name	The name of the current sub-condition, for multi-state conditions. For a single-state condition, this contains the condition name.
Change Mask	Indicates to the client which properties of the condition have changed to have caused the server to send the event notification. It may have one or more of the following values: OPC_CHANGE_ACTIVE_STATE OPC_CHANGE_ACK_STATE OPC_CHANGE_ENABLE_STATE OPC_CHANGE_QUALITY OPC_CHANGE_SEVERITY OPC_CHANGE_SUBCONDITION OPC_CHANGE_MESSAGE OPC_CHANGE_ATTRIBUTE If the event notification is the result of a Refresh, these bits are to be ignored. For a "new event", OPC_CHANGE_ACTIVE_STATE is the only bit that will always be set. Other values are server-specific. (A "new event" is any event resulting from the related condition leaving the Inactive and Acknowledged state.)
NewState	A WORD bit mask of three bits specifying the new state of the condition: OPC_CONDITION_ACTIVE, OPC_CONDITION_ENABLED, OPC_CONDITION_ACKED.
Quality	Quality associated with the condition state. Values are as defined for the OPC Quality Flags in the OPC Data Access Server specification.
AckRequired	This flag indicates that the related condition requires acknowledgment of this event. The determination of those events that require acknowledgment is server-specific. For example, transition into a LimitAlarm condition would likely require an acknowledgment, while the event notification of the resulting acknowledgment would likely not require an acknowledgment.
Active Time	Time that the condition became active (for single-state conditions), or the time of the transition into the current sub-condition (for multi-state conditions). This time is used by the client when acknowledging the condition (see IOPCEventServer::AckCondition method).
Cookie	Server-defined cookie associated with the event notification. This value is used by the client when acknowledging the condition (see IOPCEventServer::AckCondition method). This value is opaque to the client.
Time in Alarm	On a periodic basis, this field is updated with the amount of time a specific alarm has been in an active alarm state. The field is reset each time the message goes into alarm, and is only available for condition messages.
	The following is used only for tracking events and for condition-related events that are acknowledgment notifications.
ActorID	For tracking events, this is the actor ID for the event notification. For condition-related events, this is the AcknowledgerID when OPC_CONDITION_ACKED is set in NewState. If the AcknowledgerID is a NULL string, the event was automatically acknowledged by the server. For other events, the value is a pointer to a NULL string.

Event Type Values

EVENT TYPE	VALUE	DESCRIPTION
OPC_SIMPLE_EVENT	1	Simple event.
OPC_TRACKING_EVENT	2	Tracking event.
OPC_CONDITION_EVENT	4	Condition-Related event.

Change Mask Values

CHANGE MASK ITEM	VALUE	DESCRIPTION
OPC_CHANGE_ACTIVE_STATE	1	The condition's active state has changed.
OPC_CHANGE_ACK_STATE	2	The condition's acknowledgment state has changed.
OPC_CHANGE_ENABLE_STATE	4	The condition's enabled state has changed.
OPC_CHANGE_QUALITY	8	The ConditionQuality has changed.
OPC_CHANGE_SEVERITY	16	The severity level has changed.
OPC_CHANGE_SUBCONDITION	32	The condition has transitioned into a new sub-condition.
OPC_CHANGE_MESSAGE	64	The event message has changed (compared to prior event notifications related to this condition).
OPC_CHANGE_ATTRIBUTE	128	One or more event attributes have changed (compared to prior event notifications related to this condition).

New State Values

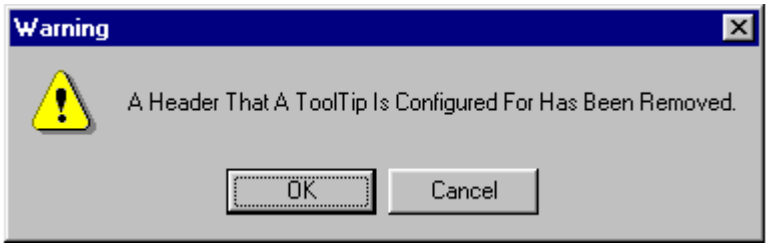
NEW STATE	VALUE	DESCRIPTION
OPC_CONDITION_ENABLED	1	The condition has been enabled.
OPC_CONDITION_ACTIVE	2	The condition has become active.
OPC_CONDITION_ACKED	4	The condition has been acknowledged.

Note: Alarm Type cannot be deleted from the **Selected Headers** list.

Note: If you remove a header from the selected list that was used in the sort list, you will get the following warning message.

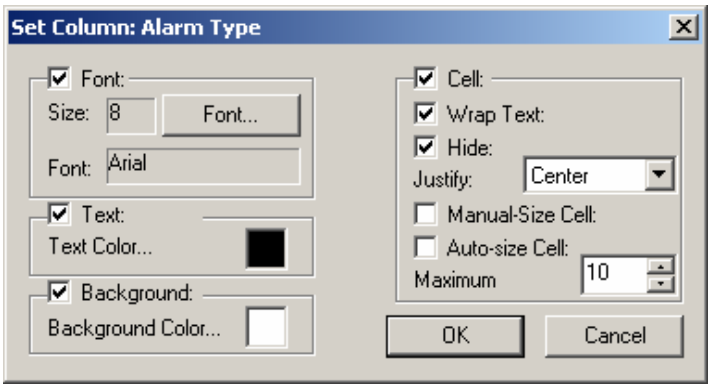
Click **OK** and open the **Display** tab to see how the **Sort** list has been changed.

Note: If you remove a header from the selected list that was used in the help or comment ToolTip configuration, you will get the following warning message:



Click **OK** and open the **ToolTips** tab to see how the ToolTip configuration has been changed.

You can also change the appearance of a column by either double-clicking on an item in the **Selected** list or selecting the item and clicking the **Config** button. The **Set Column** configuration dialog for the item opens, as shown below. From this dialog, you can set the font, color, width, and cell properties by selecting and changing the various options available.



Setting the Column Properties

To change the configuration for **Font, Text Color** or **Cell,** the appropriate box must be checked. To change the font size and style, click the **Font**. Once you have made the desired changes, the new size and style will appear in the corresponding boxes.

Note: It is not possible to change the size and style without using the **Font** dialog.

To change the column color, click the **Background Color** box and use the **Color** dialog to make your changes.

To change the text column color, click the **Text Color** box and use the **Color** dialog to make your changes

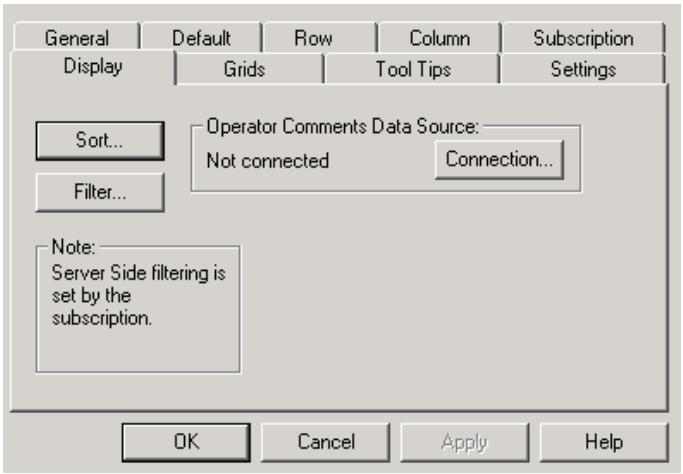
The **Cell** section configures how the text appears within each cell and how the size of each cell is determined. Checking **Wrap Text** box makes the text wrap when it hits the end of the particular cell. When this option is not applied, text will continue in one line although only part of the text will be visible, depending on the size of the cell. Please note that the **Wrap Text** feature is available only with multiline rows. The **Justify** field determines the justification (left, center or right) of the text within each cell.

There are three options for determining the size of each cell:

- **Manual-Size Cells:** Checking this box allows you to manually set the width of each column. Manual sizing of columns can only be done during runtime.
- **Auto-Size Cells:** When this box is checked, the viewer automatically sets the width of each column. The viewer automatically sets each column to the width nearest to the size of the ActiveX divided by the number of visible columns.
- **Maximum Length for Each Cell:** Currently this is a range from 1 to 1000, and it applies the maximum cell length to all cells.

Display

The **Display** tab of the **Alarm Viewer ActiveX Properties** dialog box, shown below, configures options for sorting or client-side filtering.



Alarm Viewer ActiveX Properties: Display Tab

To configure the sorting feature, click the **Sort** button. This opens the **Sort** dialog, as shown in the figure below.

The **Sort Alarms by** section indicates the first criteria the Alarm Viewer should use when sorting all current alarms. The following **Then by** sections indicate how the viewer should sort alarms that have the same value for the criteria selected in the first section.

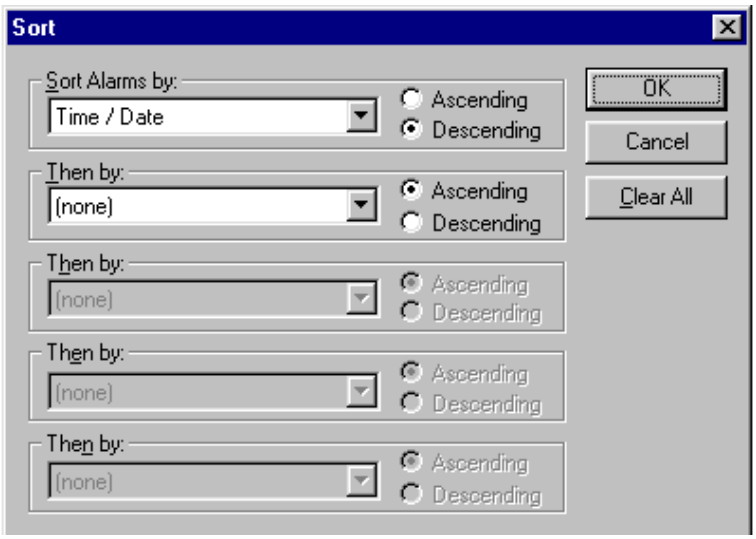
Note: It is not necessary to have any values listed in the **Then by** sections.

The **Sort** dialog allows you to configure which criteria to sort the alarms by. It also allows for multilevel sorting up to five levels with ascending/descending specific to each level. The Alarm Viewer will always sort. The default sort for a new viewer is **Time/Date.**

Sort Ascending sorts the data in the column in ascending order (i.e. from least to greatest).

Sort Descending sorts the data in the column in ascending order (i.e. from greatest to least).

Note: The **Sort** dialog, including any configuration, is also available in runtime.

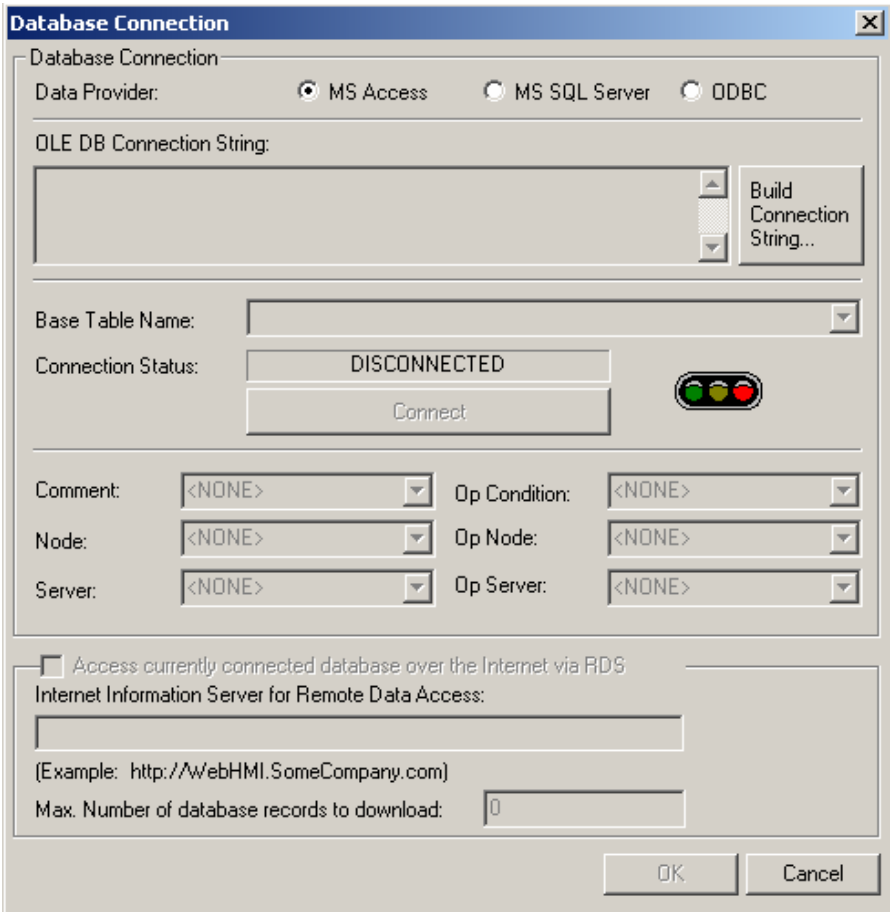


Sorting Alarms

Connecting to a Data Source

To connect to a data source:

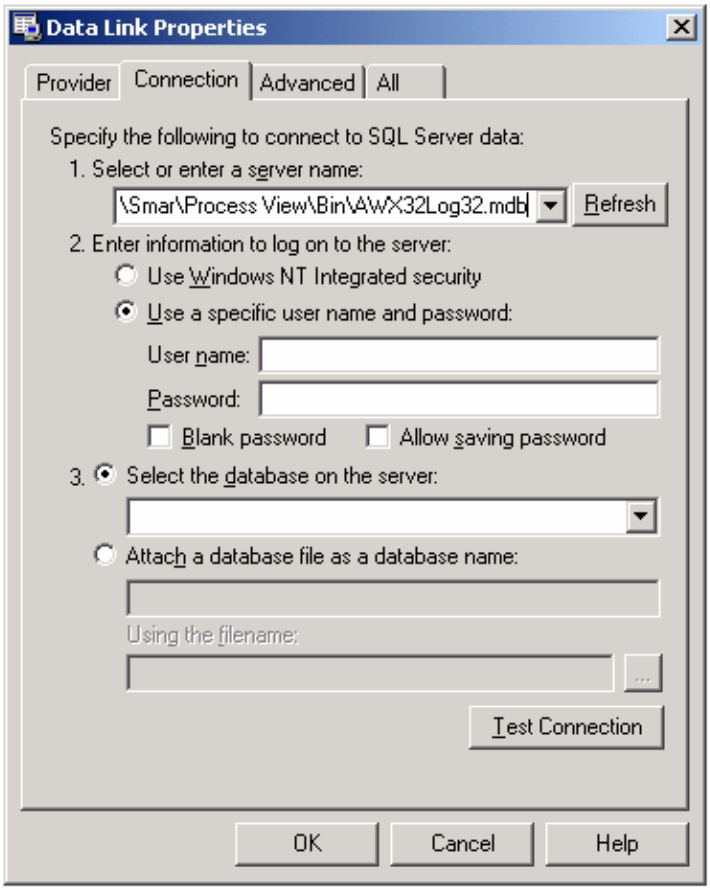
1. Click the **Connection** button. This opens the **Database Connection** dialog box, as shown below.
2. Under **Data provider,** select from Microsoft Access, Microsoft SQL Server, or ODBC (Open Data Base Connectivity), as shown in the figure below**.**



Connecting to a Database

3. Click the **Build Connection String** button. This opens the Microsoft **Data Link Properties** dialog box, as shown in the figure below. In the **Connection** tab specify the data source and then click **OK.**

Note: All data source connections are made through the **Data Link Properties** dialog box. The **Connection** tab settings may vary depending on which data provider you selected. Click the **OK** button. Click the **Help** button at any time to view the Microsoft Data Link help documentation.

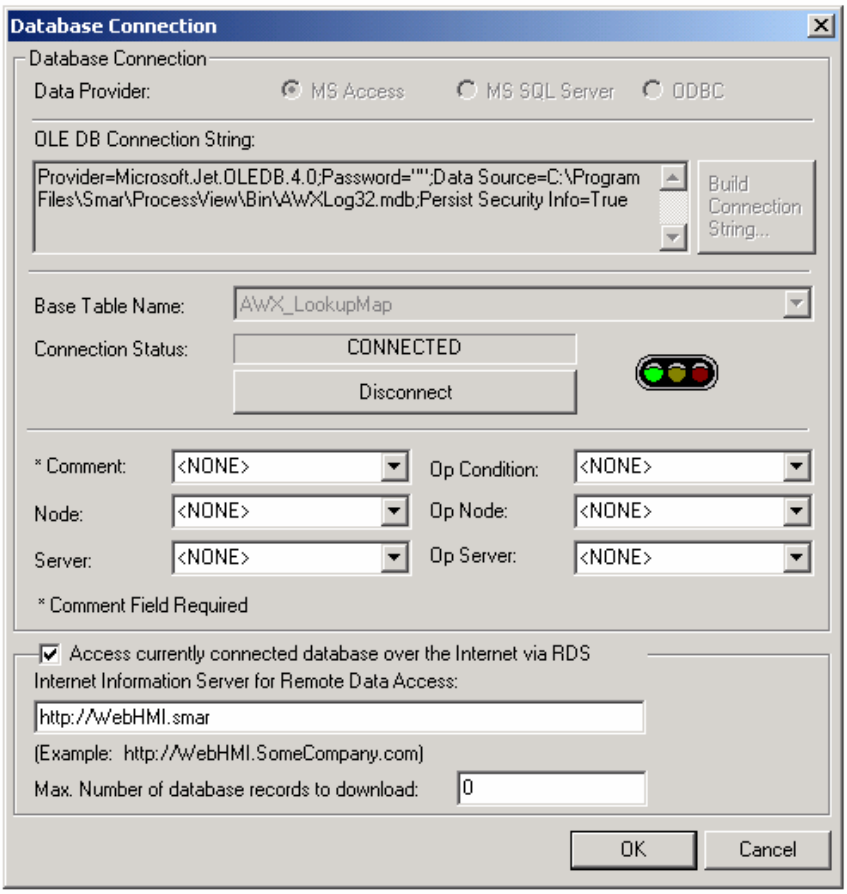


Specifying a Data Source

4. The data source reference appears in the **Database Connection** dialog box in the **OLE DB Connection String** field, as shown below. The **Base Table Name** field lists the tables in the database. You can select a specific table from the drop-down list to use as the reference table for the database.

Note: The **Base Table** list varies according to the active Alarm Logger configuration database.

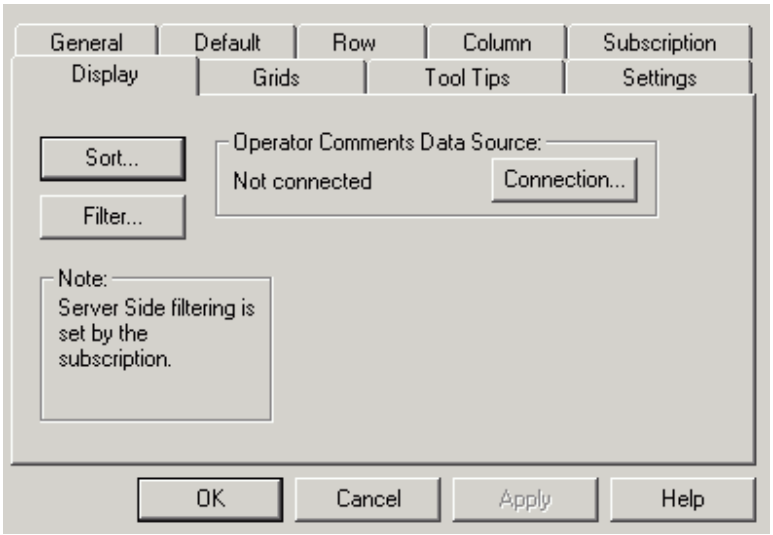
5. Click the **Connect** button to connect to the database. The traffic light icon changes to green when the connection is successful, as shown in the figure below.



Database Connection

Web Access and Support for Operator Comments

The **Display** tab of the **Alarm Viewer ActiveX Properties** dialog box, shown below, also allows you to connect to an operator comments database.

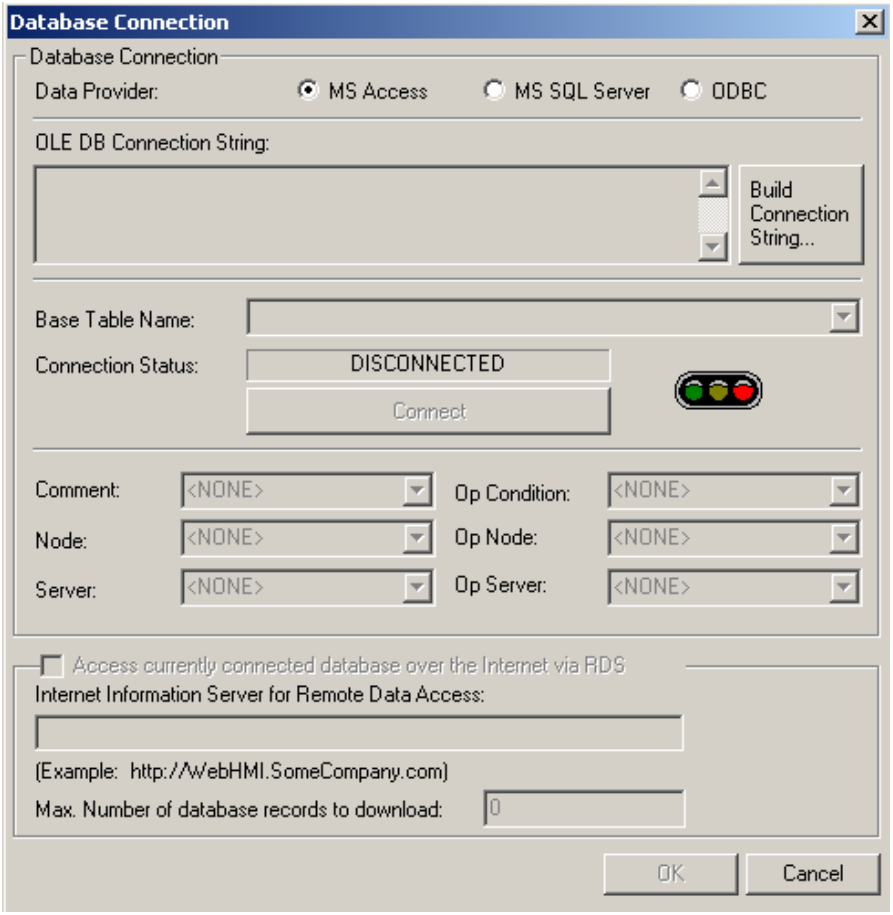


Alarm Viewer ActiveX Properties: Display Tab

Connecting to the Operator Comments Database

In most situations, you will use the **AWXLog.mdb** Microsoft Access database (located in the ProcessView Bin directory) as your operator comments database. This is the standard Alarm Logger database. To connect to the operator comments database:

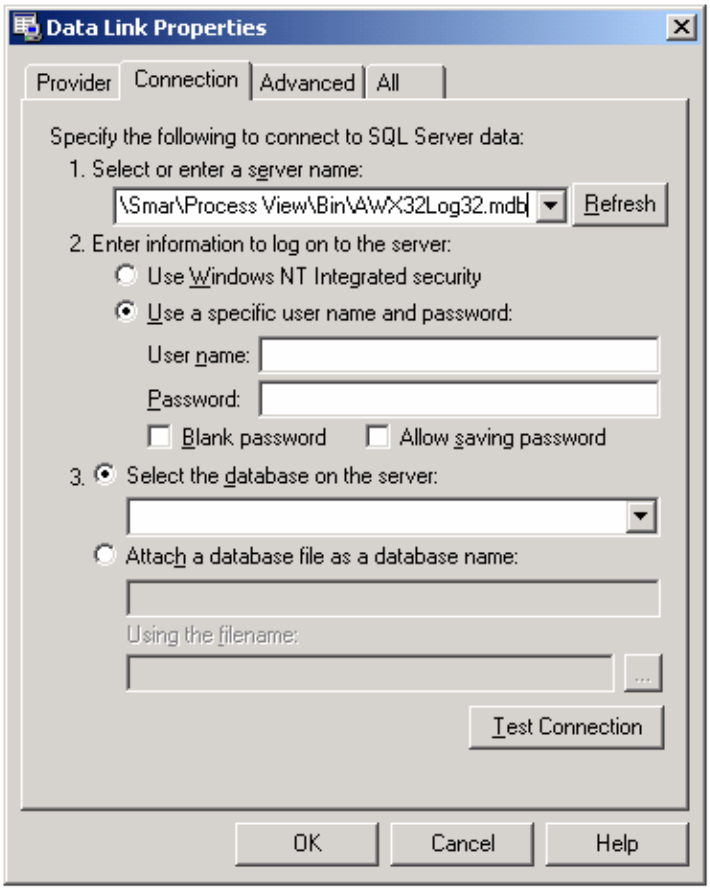
1. Click the **Connection** button on the **Display** tab. This opens the **Database Connection** dialog box, as shown below.
2. Under **Data provider,** select **Microsoft Access,** as shown in the figure below**.**



Connecting to a Database

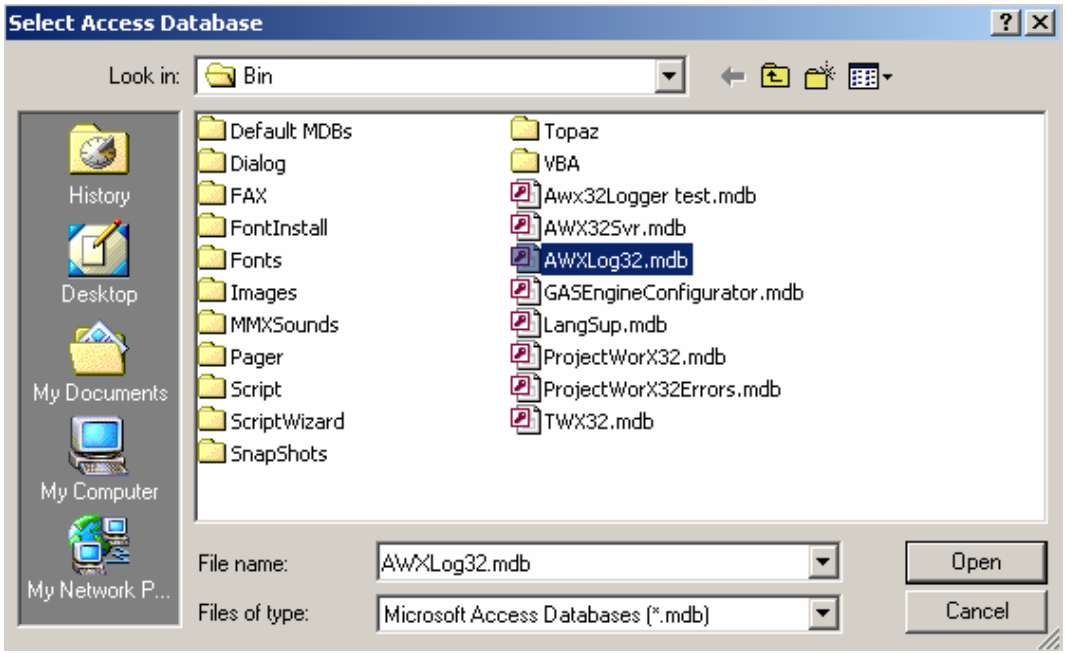
3. Click the **Build Connection String** button. This opens the Microsoft **Data Link Properties** dialog box, as shown in the figure below.

Note: All data source connections are made through the **Data Link Properties** dialog box. The **Connection** tab settings may vary depending on which data provider you selected. Click the **OK** button. Click the **Help** button at any time to view the Microsoft Data Link help documentation.



Specifying a Data Source

4. Click the **…** button and select the **AWXLog.mdb** file from the bin directory. Click the **Open** button.

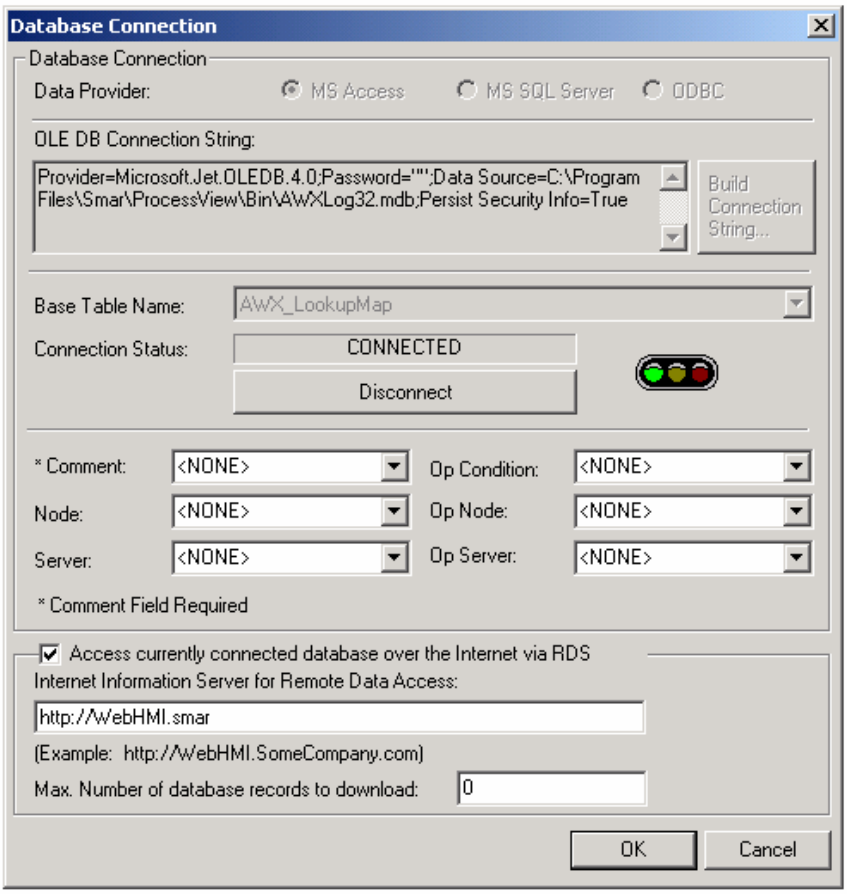


Selecting the Operator Comments Database

5. The data source reference appears in the **Database Connection** dialog box in the **OLE DB Connection String** field, as shown below. In the **Base Table Name** field, select **EventLog** from the drop-down list.

Note: The **Base Table** list varies according to the active Alarm Logger configuration database.

6. Click the **Connect** button to connect to the database. The traffic light icon changes to green when the connection is successful, as shown in the figure below.



Database Connection

7. Now you must specify which column in the database table you will use to for logging and storing comments. In the **Comment** box, select a column from the drop-down list. For most cases, only the **Comment** box should be configured. The exception is the case where the system is logging from two different alarm servers, using the same tag names in both alarm server configurations. This is the only case where the **Node, Server, Op Condition, Op Node,** and **Op Server** selections should be used.

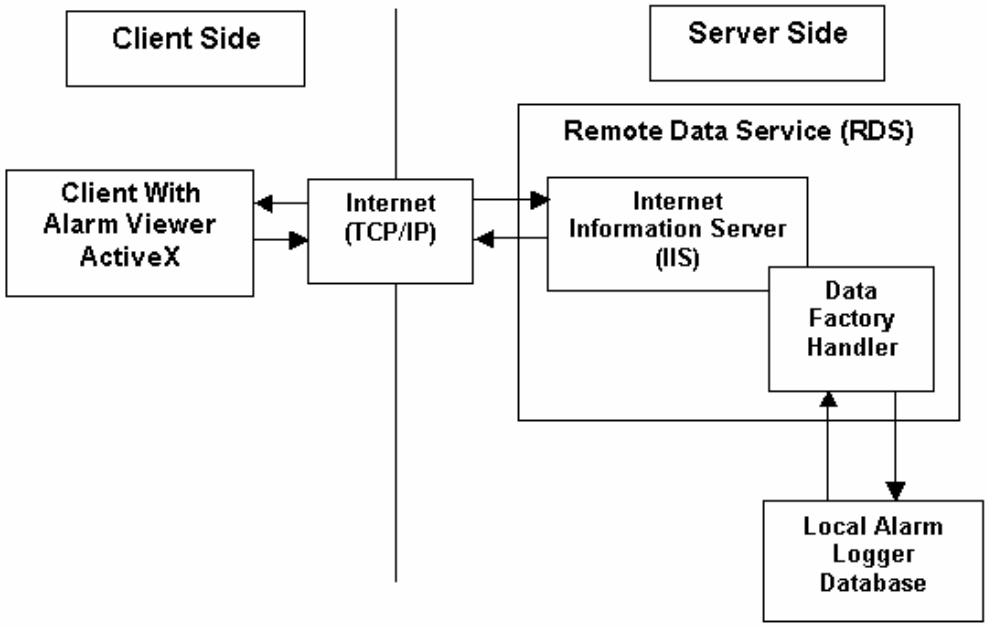
Enabling Remote Web Access to Operator Comments

The Alarm Viewer enables you to gain access to operator comments from the currently connected Alarm Logger database over the Internet. To enable Web access to operator comments, check the **Access currently connected database over the Internet via RDS** check box at the bottom of the **Database Connection** dialog box. A **Remote Data Service (RDS),** which is hosted by an Internet Information Server (IIS), enables the downloading of operator comments data from the logger database to a client over the Internet.

Once you have connected to the operator comments database. Simply specify the URL name or IP address of the IIS Web server in the **Internet Information Server for Remote Data Access** field in the **Database Connection** dialog box. You can also specify a maximum number of database records to download from the logger database.

When Internet Access to the logger database is enabled, the client makes a request over the Internet to the IIS Remote Data Service. The RDS uses a special component, called the Data Factory Handler, to relay the request to the local logger database on the server, as shown in the figure below. The RDS retrieves the relevant information for the alarm report from the logger database so that the client can download the data from the server over the Internet. The client machine then displays the data in the Viewer ActiveX per the client's configuration settings.

In most typical scenarios, the Viewer ActiveX configuration is done on the server side. Configuration data saved as a *.awv file or a *.gdf display containing the Viewer ActiveX are published to an HTML document on a WebHMI server.



Downloading Operator Comments From a Remote Logger Database

Tips for Remote Data Access

A good understanding of Remote Data Access principles is a key element to building a successful solution for a Web-enabled alarm reporting system. Since the volume of alarm databases can reach hundreds of megabytes, it is very important to keep in mind the following aspects.

Maximum Number of Downloadable Database Records and Adequate Record Filtering

The setting for the maximum number of records to download (Nmax) indicates that any database query operations would return no more than Nmax alarm records (lines to the grid). If more than Nmax records from the current table match the current filtering criteria, then only the portion of the record set containing top Nmax records is returned. To avoid such record set cut-off, strong restrictive record filters should be used all the time. Since the record filters are processed on the database side, the database server uses all existing records to build the record set.

Proper Choice of the Back-end Database

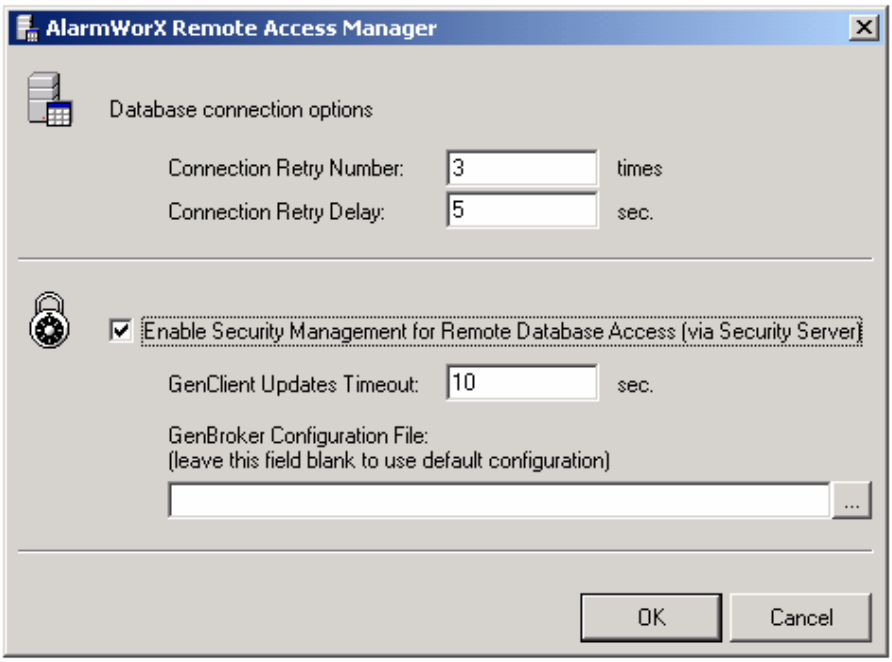
It should be noted that the use of Microsoft Access databases (*.mdb) is not recommended for Web Access. Poor memory management in Microsoft Jet Engine creates a serious scalability problem for any type of Web database application. **The recommended back-end database for Web alarming is MSDE (Microsoft Desktop Engine) or Microsoft SQL Server.**

Table Management in Alarm Logger Configuration

To provide further optimization for the Alarm Logger database operations, the table management should be enabled in the logger configuration. See the Alarm Logger Configurator documentation for more information.

Using the Remote Database Access Manager

The **AlarmWorX Remote Database Access Manager,** shown in the figure below, is a separate utility (the **AWXRepRDSSM.exe** file) located in the ProcessView Bin directory. This utility configures the communication parameters for the Data Factory Handler (described above) so that the AlarmWorX Viewer ActiveX can connect to a remote Alarm Logger database and retrieve data from the database. It also enables security for remote database access via the ProcessView Security Server.



AlarmWorX Remote Database Access Manager

Database Connection Options

The **Database Connection Options** section of the AlarmWorX Remote Database Access Manager sets the following connection parameters for the Data Factory Handler:

- **Connection Retry Number:** Specifies the maximum number of times the Data Factory Handler will try to reconnect to the Alarm Logger database in case the connection fails.
- **Connection Retry Delay:** Sets the amount of time (in seconds) the Data Factory Handler waits between subsequent connection retries to the Alarm Logger database.

Security Management

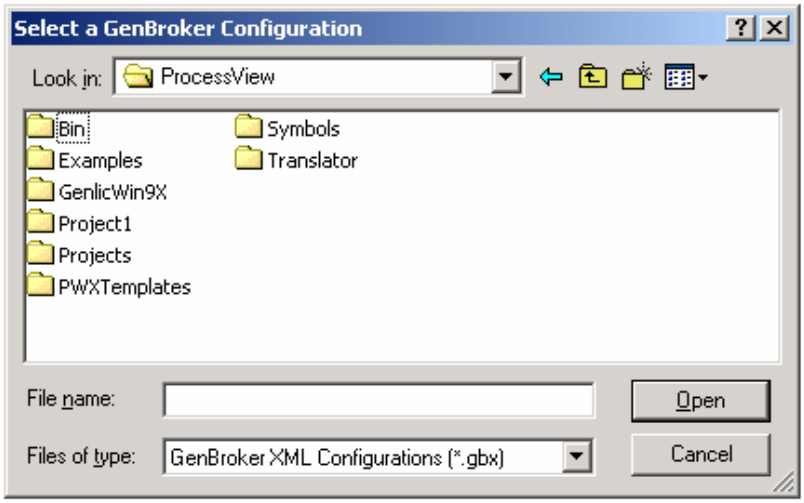
The AlarmWorX Remote Database Access Manager allows you to enable security for remote database access via the ProcessView Security Server. Check the **Enable Security Management for Remote Database Access (via Security Server)** check box. When security is enabled, each time a user tries to access the Alarm Logger Database, the Security Server will check to verify whether that user is allowed to have remote access to the database.

Note: For information about the Security Server configuration and login, please see the Security Configurator and Security Login Help documentation.

Because the database is accessed over the Internet via TCP/IP communications, GenBroker communications over OPC over TCP/IP must also be enabled. Thus, you must specify a **GenBroker Configuration File** (.gbc or .gbx). Clicking the **...** button to the right of this field allows you to browse for a GenBroker configuration file, as shown in the figure below. If you do not specify a GenBroker configuration file, or if no Security Server is specified in the GenBroker configuration, then the default system GenBroker configuration file will be used.

Note: If you are using WebHMI, it is recommended that the Security Server be located on the same machine as the WebHMI Server. For information about how to configure GenBroker communications, please see the GenBroker Help documentation.

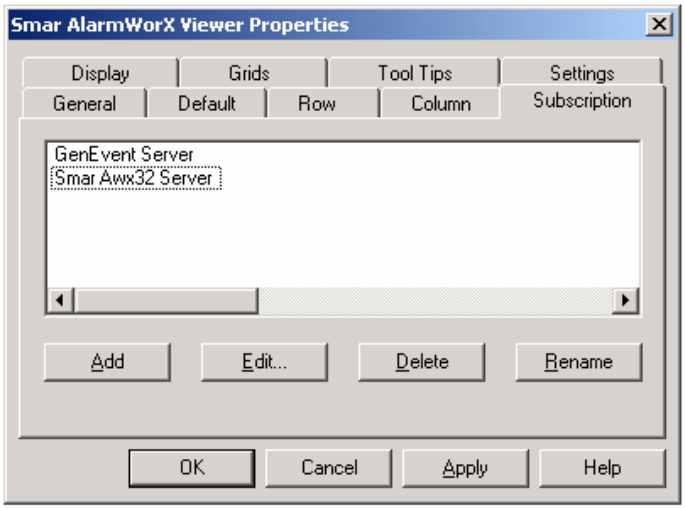
The **ProcViewClient Updates Timeout** sets the maximum amount of time (in seconds) the Data Factory Handler will wait for Security Server validation of a data request from the client (i.e. the client with the Alarm Viewer ActiveX installed) before returning an "Access Denied" error.



Selecting a GenBroker Configuration File

Subscription

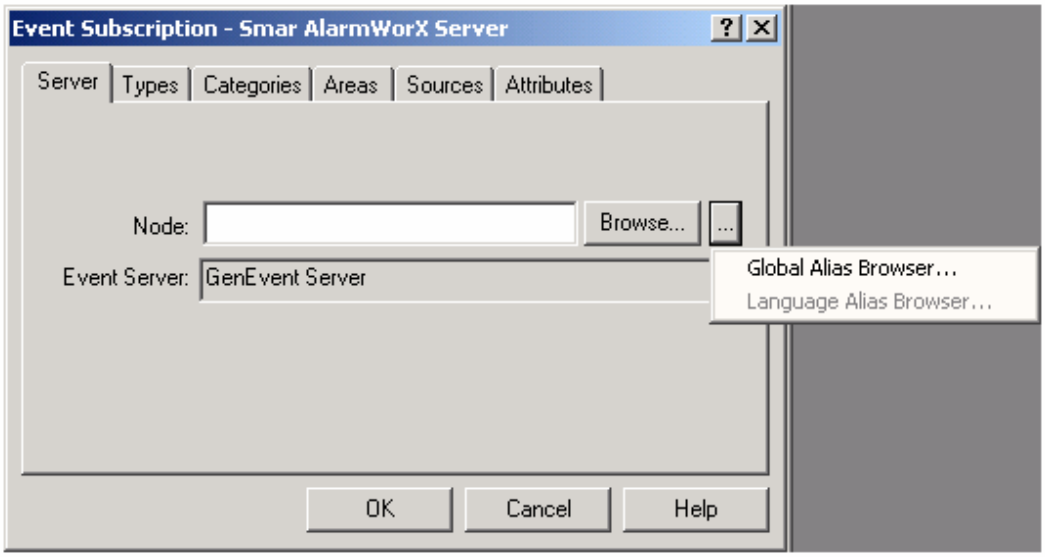
The **Subscription** tab of the **Alarm Viewer ActiveX Properties** dialog box, shown below, determines what type of OPC connection will be made. It allows you to add, rename, delete, or edit a subscription to a particular alarm. To add a new subscription, click the **Add** button.



Alarm Viewer ActiveX Properties: Subscription Tab

The subscription named "New Subscription" appears. This subscription does not contain any data, so it is necessary to immediately edit the new subscription. To do so, click the **Edit** button to open the **Event Subscription** dialog box, as shown in the figure below. It is only possible to add or edit subscriptions that are connected to active OPC Alarm and Event servers.

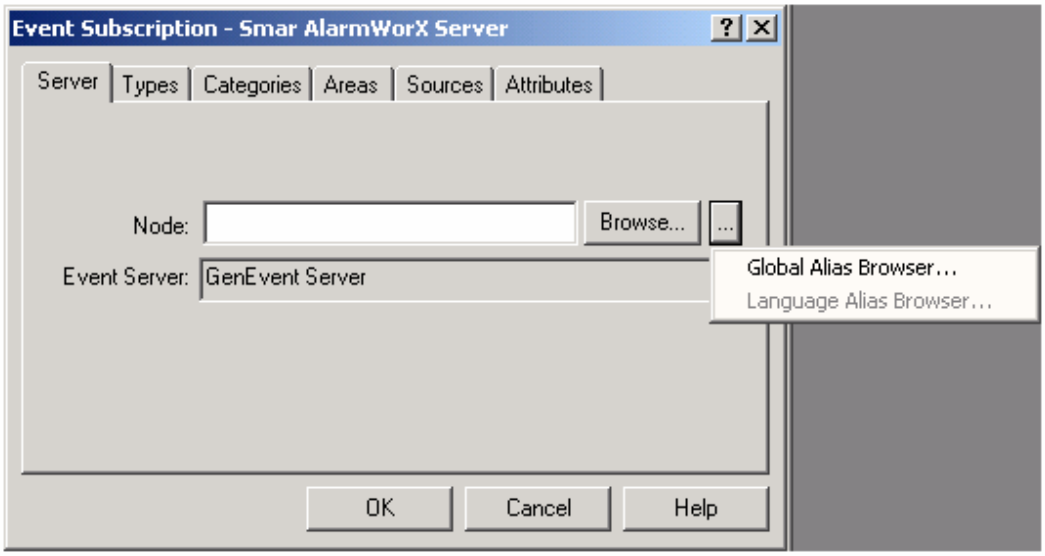
Note: It is possible for a server to have more than one subscription. In fact, it is a very effective way to achieve filtering.



Creating an Event Subscription

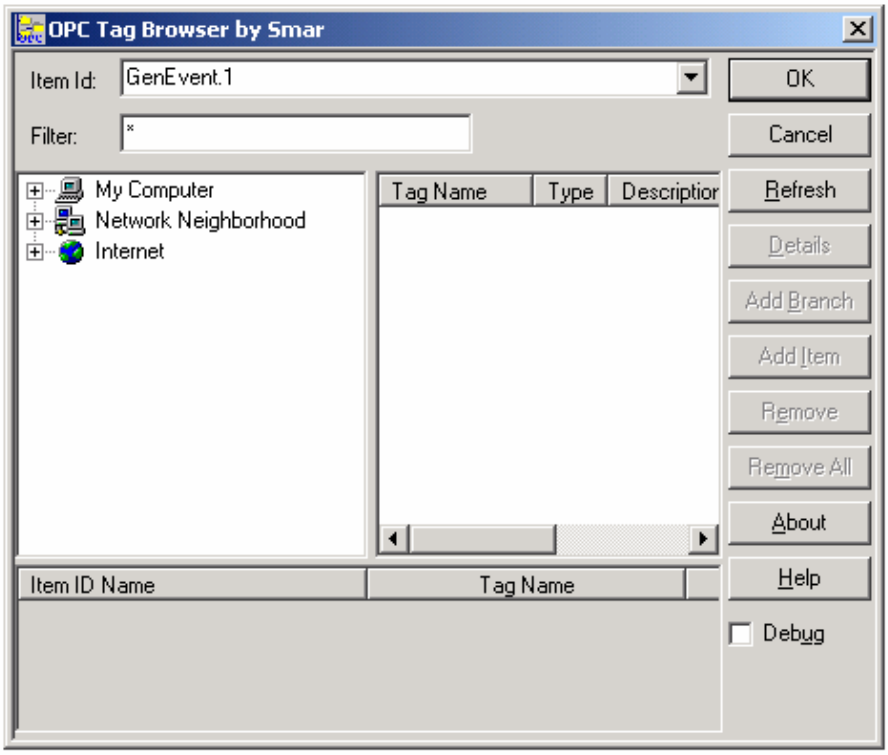
Server

The **Server** tab of the **Event Subscription** dialog box, shown in the figure below, allows you to select an **Alarm and Event Server** and **Node** for each subscription. To select the event server, click the **Browse** button.



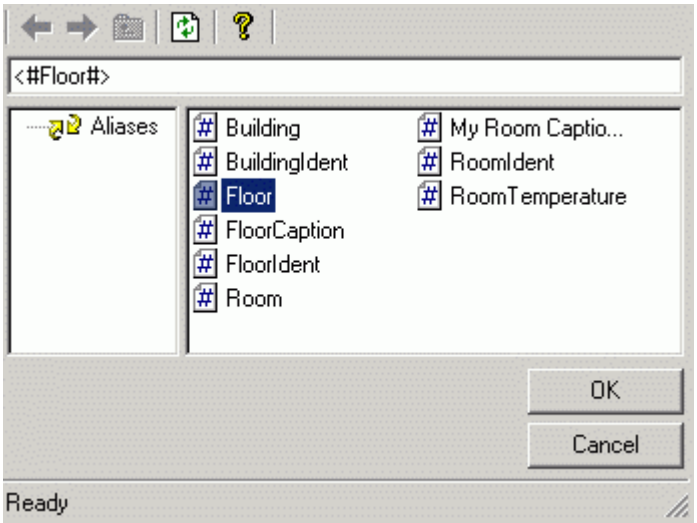
Event Subscription Dialog Box: Server Tab

This opens the **OPC Universal Tag Browser,** shown in the figure below, which lists all available Alarm and Event OPC servers. Select the desired server, and click **OK.** For local servers, it is not necessary to fill in the **Node** field.



Selecting an Alarm and Events Server From the OPC Universal Tag Browser

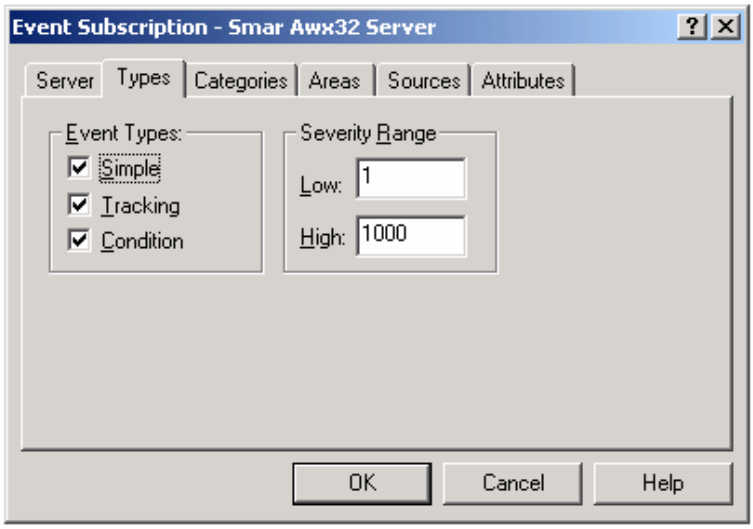
You can also select global aliases to use in the **Node** field. Clicking the **...** button and selecting **Global Alias Browser** from the pop-up menu opens the Global Alias Browser, as shown in the figure below. Select a global alias from the Global Alias Browser, which includes all global aliases in the global alias database. This eliminates the need to manually type in the alias name. All global aliases that are configured in the Global Alias Engine Configurator are conveniently available to choose from inside the browser. The tree control of the Global Alias Engine Configurator is mimicked in the tree control of the Global Alias Browser. Select a global alias by double-clicking the alias name (e.g. "Floor" in the figure below). The alias name appears at the top of the browser, which automatically adds the <# and #> delimiters to the alias name. Click the **OK** button.



Selecting an Alias From the Global Alias Browser

Types

The **Types** tab of the **Event Subscription** dialog box, shown in the figure below, allows you to configure which OPC-defined event types each subscription should have, as well as to set the ranges for severity (priority). A value of "0" represents the low severity value, and "1000" represents the high severity value. Please note that OPC Alarm and Event (AE) servers are required to scale severity values to the OPC ranges (i.e. an AE server that contained two severity ranges would convert these to "0" and "1000").



Event Subscription Dialog Box: Types Tab

Simple: These messages state information but do not have alarm status, nor do they contain information on what initiated the message. This includes the following information: Source, Time, Type, EventCategory, Severity, Message, Cookie, and server-specific items.

Example: "FIC101, 12:0:0 1/1/99, Simple, Category1, 100, 'Shift Change', 1"

Simple messages would be similar to an event.

Tracking: These messages contain the additional information about the client that initiated the event. This includes the following information: Source, Time, Type, EventCategory, Severity, Message, Cookie, ActorID, and server-specific items.

Example: "FIC101, 12:0:1 1/1/99, Tracking, Category1, 300, 'Pump pressure Set to 10 psi', 1, Station 12"

Tracking messages are similar to event messages in that the cause of the event is important. An example would be an operator changing a setpoint value. This type of message does not include acknowledge capability.

Note: Simple and tracking messages are removed from the alarm viewer via the acknowledge mechanism.

Condition: These messages contain all of the above information but also include an acknowledgement portion. This includes the following information: Source, Time, Type, EventCategory, Severity, Message, Cookie, ConditionName, SubConditionName, ChangeMask, NewState, ConditionQuality, AckRequired, ActiveTime, ActorID and server-specific items.

Example: "FIC101, 12:0:3 1/1/99, Condition, Category1, 700, 'Pump pressure to high', 1, Limit, HiHi, 1,Active Enabled, Good, TRUE, 12:0:2 1/1/99"

Condition messages would be considered a "typical" alarm message with acknowledge capability.

For further details on any of the included information, please refer to the OPC Alarm and Events specification.

Categories

The **Categories** tab of the **Event Subscription** dialog box, shown in the figure below, allows you to select the categories for a subscription. Select the category from the list of available categories, and then click the **Add ->** button. The category will appear in the **Subscribed** list. To remove a category from this list, select it in the **Subscribed** list and click the **<- Remove** button. If no categories are listed in the **Subscribed** list, then all categories are selected by default.

Event Types and Categories

All events generated are of the OPC defined Event Type **Condition.** The AlarmWorX Server defines the following **Event Categories** and uses the identical names for the **Condition Names:**

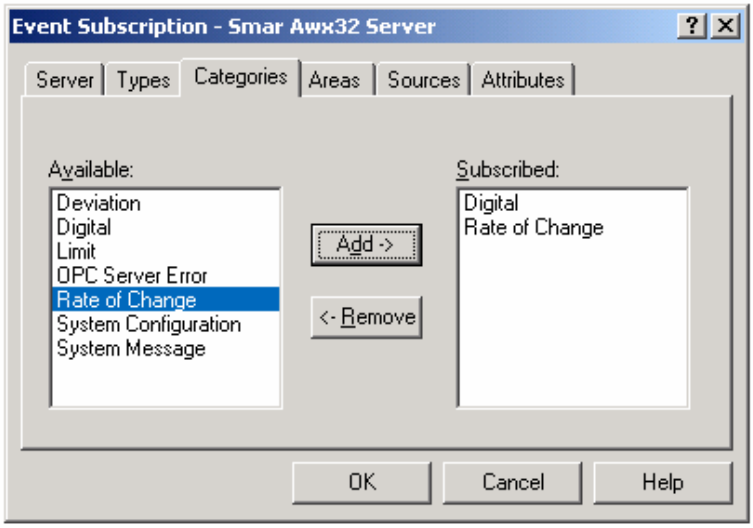
- Deviation
- Digital
- Limit
- Rate of Change

The **Limit** and **Deviation** conditions have the following Sub-conditions:

- HiHi
- Hi
- Lo
- LoLo

Note: The following categories are not used in the SMAR Alarm Server:

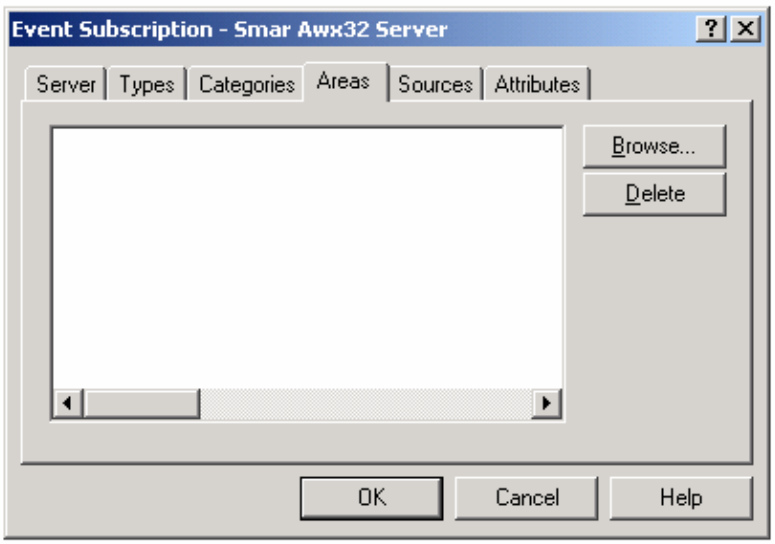
- OPC Server Error
- System Configuration
- System Message



Event Subscription Dialog Box: Categories Tab

Areas

Use the **Areas** tab of the **Event Subscription** dialog box, shown in the figure below, to select an area or a group of areas for filtering in a subscription. An **area** is used to group OPC alarm tags. This information can be used by clients for filtering purposes. A tag can exist under multiple areas, and an area can have a multiple levels. An area is defined by its name and the name of its parent branches. For example, a branch called Area 1 under plant Area A is different from Area 1 under plant Area B. Areas can be configured in the AlarmWorX Server Configurator.



Event Subscription Dialog Box: Areas Tab

Clicking the **Browse** button opens the **OPC Event Server Area / Source Browser,** shown in the figure below, which lists all available areas for your event server. Area subscription supports wildcards, which subscribe to the format of the Microsoft Visual Basic 'like" command. For example, "Area1*" will subscribe to all alarm areas that contain strings beginning with "Area1". "Area1*" will subscribe to the root area and its "child" areas. A detailed explanation of the wildcard support can be found in the OPC Alarm and Events documentation. It is recommended that you thoroughly read the wildcard documentation before attempting to use complicated expressions.

Note: For the like operator: "string" equals the string to search in; "pattern" equals the string to search for (can include wildcards); nonzero for case-sensitive search; zero for case-insensitive search. String syntax is $"string"$.

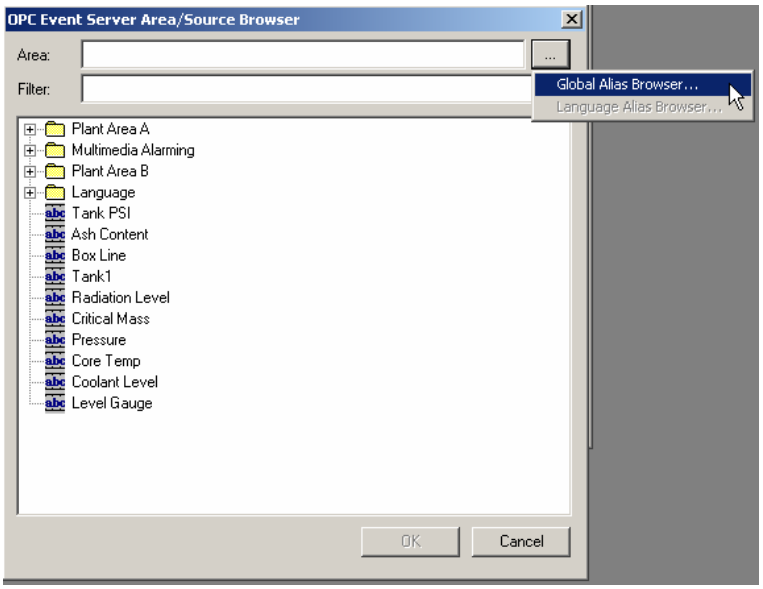
You can use these special characters in pattern matches in string:

- ? Any single character.
- Zero or more characters.
- # Any single digit (0-9).
- [charlist] Any single character in charlist.
- [!charlist] Any single character not in charlist.

It is also possible to delete an area from the **Areas** tab. To delete an area, select it from the list of areas for this particular subscription, and then click the **Delete** button. Not all OPC Alarm and Event servers support area filtering as part of the subscription.

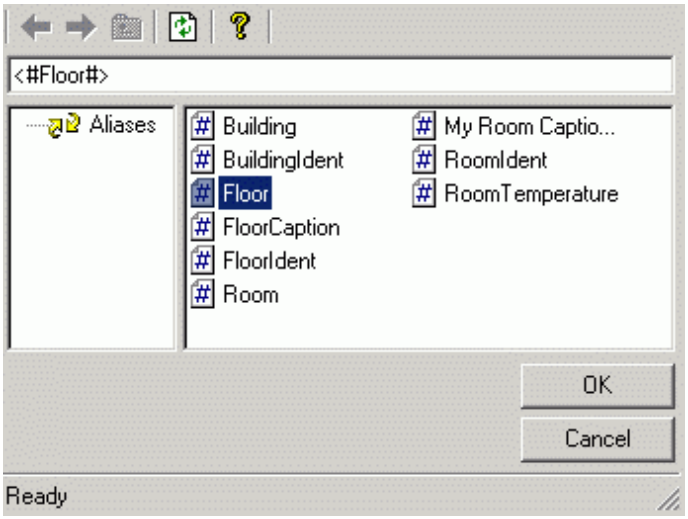
Note: If no areas are listed, then all areas are selected by default.

Note: It is recommended that you have an area in the alarm server to which you subscribe; this ensures that the relevant alarms are received. Any available areas listed in the active Alarm Server configuration database are available to choose from in the Area/Source Browser, as shown in the figure below.



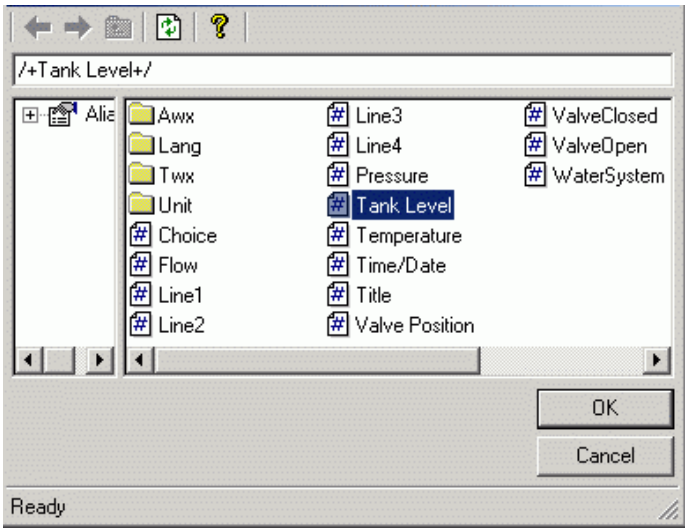
OPC Event Server Area/Source Browser

You can also select global aliases to use in the **Area** field. Clicking the **...** button and selecting **Global Alias Browser** from the pop-up menu opens the Global Alias Browser, as shown in the figure below. Select a global alias from the Global Alias Browser, which includes all global aliases in the global alias database. This eliminates the need to manually type in the alias name. All global aliases that are configured in the Global Alias Engine Configurator are conveniently available to choose from inside the browser. The tree control of the Global Alias Engine Configurator is mimicked in the tree control of the Global Alias Browser. Select a global alias by double-clicking the alias name (e.g. "Floor" in the figure below). The alias name appears at the top of the browser, which automatically adds the <# and #> delimiters to the alias name. Click the **OK** button.



Selecting an Alias From the Global Alias Browser

Clicking the **...** button and selecting **Language Alias Browser** from the pop-up menu opens the Language Alias Browser, as shown in the figure below. The browser includes all languages aliases in the language database. All language aliases that are configured in the Language Configurator are conveniently available to choose from inside the browser. The tree control of the Language Configurator is mimicked in the tree control of the Language Alias Browser. Select a language alias by double-clicking the alias name. The alias name appears at the top of the browser, which automatically adds the /+ and +/ delimiters to the alias name. Click the **OK** button.

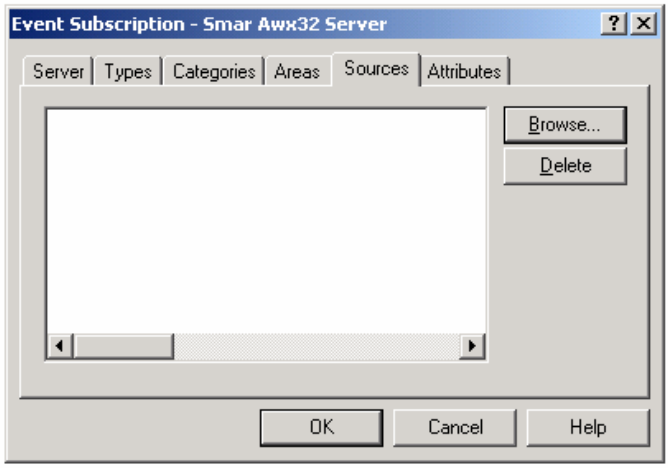


Selecting an Alias From the Language Alias Browser

Sources

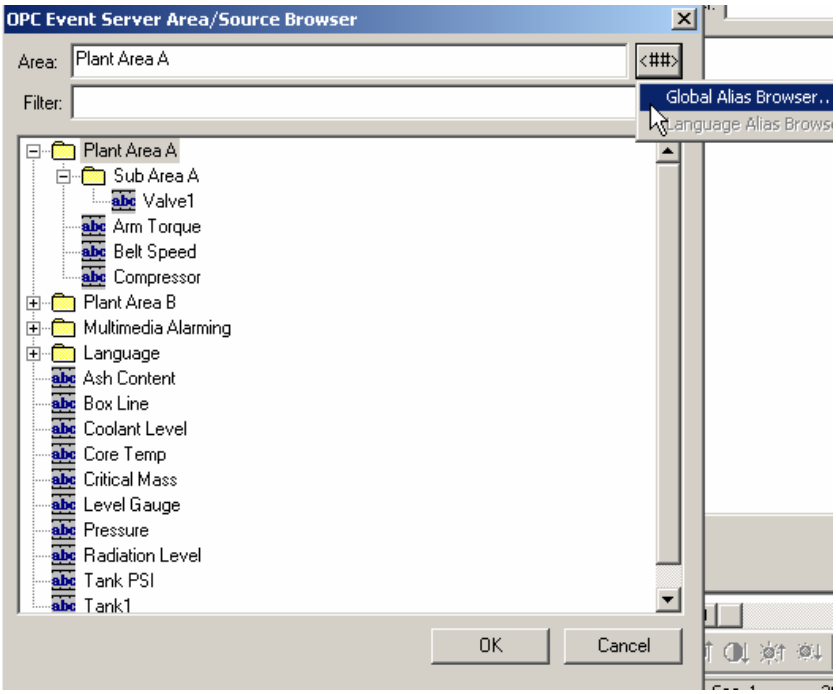
The **Sources** tab of the **Event Subscription** dialog box, shown in the figure below, allows you to filter on a source or group of sources for a particular subscription. A **source** is an OPC alarm tag in an alarm configuration. In the AlarmWorX Server Configurator, a source can be associated with a particular area (group of alarm tags). It is also possible to delete a source for a particular subscription. To delete a source, select it from the list of sources for this particular subscription and click the **Delete** button. Not all OPC Alarm and Event servers support source filtering as part of the subscription.

Note: If no sources are listed, then all sources are selected by default. Any available sources listed in the active Alarm Server configuration database are available to choose from in the Area/Source Browser, as shown in the figure below.



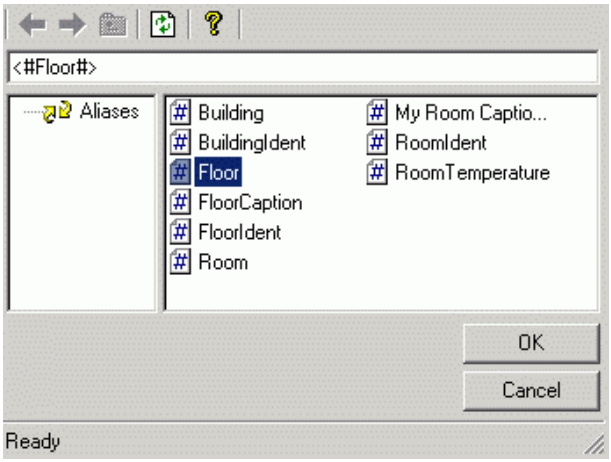
Event Subscription Dialog Box: Sources Tab

To select a source, click the **Browse** button and select one from the **OPC Event Server Area / Source Browser,** shown in the figure below. Source subscription provides the wildcard support found in the area subscription.



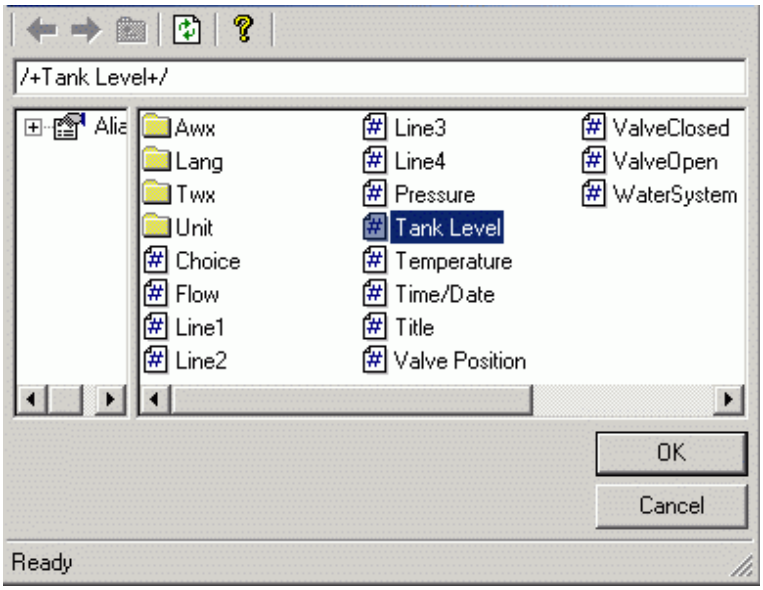
OPC Event Server Area/Source Browser

You can also select global aliases to use in the **Area** field. Clicking the **...** button and selecting **Global Alias Browser** from the pop-up menu opens the Global Alias Browser, as shown in the figure below. Select a global alias from the Global Alias Browser, which includes all global aliases in the global alias database. This eliminates the need to manually type in the alias name. All global aliases that are configured in the Global Alias Engine Configurator are conveniently available to choose from inside the browser. The tree control of the Global Alias Engine Configurator is mimicked in the tree control of the Global Alias Browser. Select a global alias by double-clicking the alias name (e.g. "Floor" in the figure below). The alias name appears at the top of the browser, which automatically adds the <# and #> delimiters to the alias name. Click the **OK** button.



Selecting an Alias From the Global Alias Browser

Clicking the **...** button and selecting **Language Alias Browser** from the pop-up menu opens the Language Alias Browser, as shown in the figure below. The browser includes all languages aliases in the language database. All language aliases that are configured in the Language Configurator are conveniently available to choose from inside the browser. The tree control of the Language Configurator is mimicked in the tree control of the Language Alias Browser. Select a language alias by double-clicking the alias name. The alias name appears at the top of the browser, which automatically adds the /+ and +/ delimiters to the alias name. Click the **OK** button.



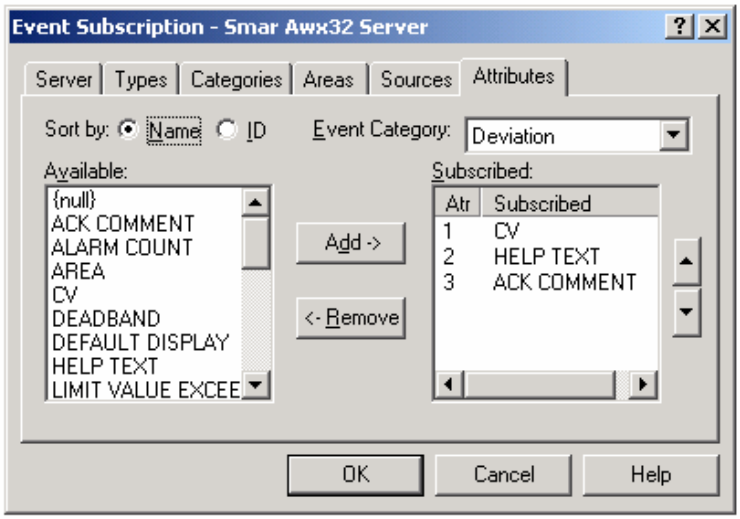
Selecting an Alias From the Language Alias Browser

Attributes

The **Attributes** tab of the **Event Subscription** dialog box, shown in the figure below, allows you to add extra attributes to a particular event category within a subscription. Select the event category from the corresponding drop-down list. Choose the desired items from the available attributes list, and click the **Add** button. To remove an attribute from the subscribed list, select that particular attribute and click **Remove.**

Note: The following categories are not used in the SMAR Alarm Server:

- OPC Server Error
- System Configuration
- System Message



Event Subscription Dialog Box: Attributes Tab

It is important to note that the order of the subscribed attributes does matter. The order of the attributes determines the order they will be selected from the alarm server, and also determines with which viewer attribute column they are associated. To change the order of the attributes in the subscribed field, simply select an attribute and click the "up" and "down" arrow buttons. Server-specific information will be displayed in the Attributes1-n columns. The attributes columns are added in the **Column** tab of the **Alarm Viewer ActiveX Properties** dialog box.

Note: To receive extra attributes, you must request them per event category.

Event Attributes

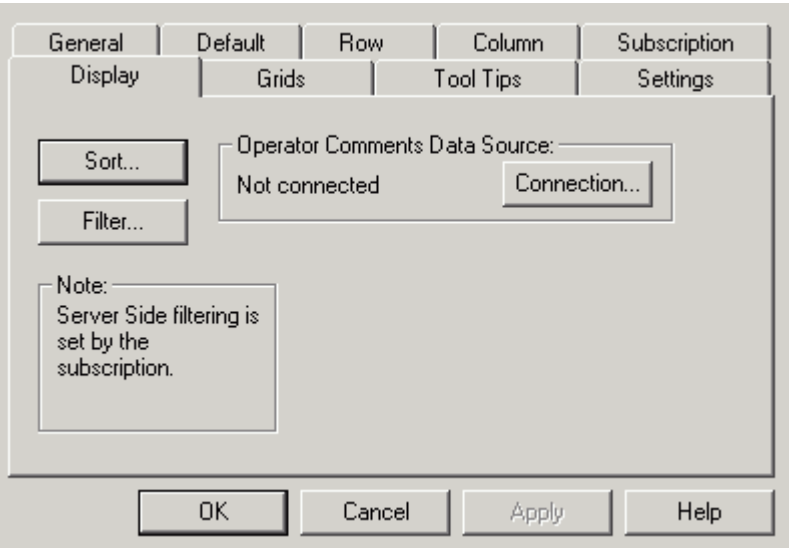
The following event attributes are made available to subscribing clients:

Attribute	Deviation	Digital	Limit	Rate of Change	Type	Comment
ACK COMMENT	✔	✔	✔	✔	VT_BSTR	Comment entered when alarm was last acknowledged.
ALARM COUNT	✔	✔	✔	✔	VT_I4	Number of alarm transitions before acknowledge.
AREA	✔	✔	✔	✔	VT_ARRAY | VT_BSTR	Array of areas
CV	✔	✔	✔	✔	VT_R8 VT_BOOL	Current Value (OPC Input 1 or 2).
DEADBAND	✔		✔	✔	VT_R8	Alarm detection Deadband.
DEFAULT DISPLAY	✔	✔	✔	✔	VT_BSTR	A text string, usually a file name, that when launched provides related information.
HELP TEXT	✔	✔	✔	✔	VT_BSTR	Help information
LIMIT VALUE EXCEEDED	✔		✔	✔	VT_R8	The Current Value at the time the limit was exceeded.
LOOP DESC	✔	✔	✔	✔	VT_BSTR	A description of the Source (tag).
NEXT_LIM	✔		✔		VT_R8	The value of the next limit.
NORMAL STATE		✔			VT_BOOL	Value of the normal state (TRUE or FALSE).
PREV LIM	✔		✔		VT_R8	Value of the previous limit reached.
RELATED VALUE 01-10	✔	✔	✔	✔		Associates up to 10 OPC tags or expressions with each alarm tag as “supplemental” information to the alarm.
SP	✔				VT_SP	Setpoint (OPC Input 2)

Client Side Filtering

There are two ways to achieve filtering using the Alarm Viewer: on the server side and on the client side. **Server-side filtering** takes place through the use of subscriptions, while **client-side filtering** takes place through the use of the **Filter** option on the **Display** tab of the **Alarm Viewer ActiveX Properties** dialog box, as shown in the figure below.

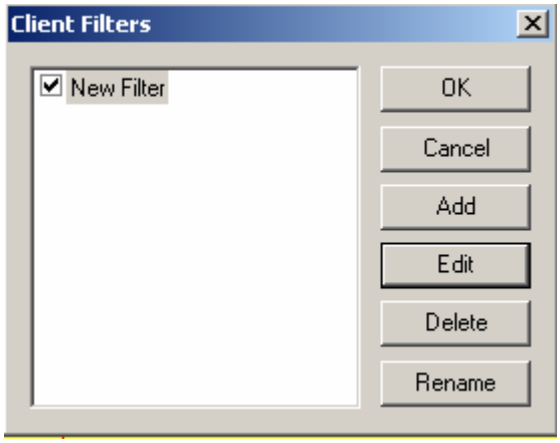
Note: When possible, server-side filtering should be the primary filtering method.



Alarm Viewer ActiveX Properties: Display Tab

Clicking the **Filter** button opens the **Client Filters** dialog box, as shown in the figure below.

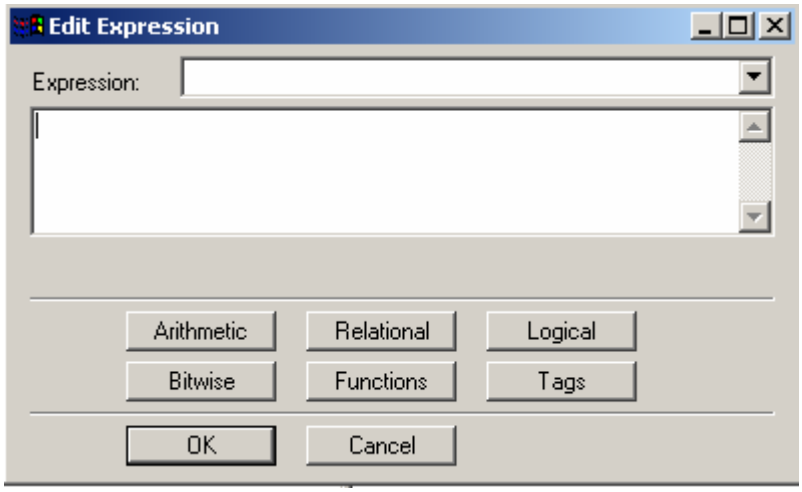
Note: You can also open this dialog box by right-clicking the viewer during runtime and selecting **Filter** from the pop-up menu.



Creating Client-Side Filters

Adding and Editing Filters

To add a filter, click the **Add** button. A new filter will appear in the list box. To enter the criteria for the filter, select the filter and click the **Edit** button. This opens the **Expression Editor,** as shown in the figure below. The Expression Editor box has the following options: Arithmetic, Relational, Logical, Bitwise, Functions, and Tags. Each of these options is explained in greater detail in following sections.



Filter Expression Configuration

Deleting Filters

To delete a filter all together, select the filter in the **Client Filters** dialog box and click the **Delete** button. Your system will ask if you really want to delete the filter; click **Yes** and the filter will be deleted.

Renaming Filters

To rename a filter, select the filter in the **Client Filters** dialog box and click the **Rename** button. You must change the filter name if you are going to add more than one filter. Try to give the filter a name that describes what it does or the values it considers when filtering.

Note: Depending on the security level of the user, filters may or may not be able to be created or activated during runtime.

Arithmetic

The symbols '+', '-', '*', '/' and '%' use the following format:

expression :: parameter **symbol** parameter

Where

Parameter	A local variable, an OPC tag, a constant, or another expression
Symbol	+ or - or * or / or %

Result

The expression results in a number of any type (float, long, etc.).

Examples

Symbol	Description	Example	Result
+	Addition	~~var1~~ + ~~var2~~	8+3 = 11
-	Subtraction	~~var1~~ - ~~var2~~	8-3 = 5
*	Multiplication	~~var1~~ * ~~var2~~	8*3 = 24
/	Division	~~var1~~ / ~~var2~~	8/3 = 2.66667
%	Calculates the remainder after division	~~var1~~ % ~~var2~~	8%3 = 2
(and)	Gives precedence to parts of the calculation	~~var1~~ / (~~var2~~ + ~~var3~~)	8/(3+2) = 1.6

Relational

The symbols '<', '>', '<=', '>=', '==' and '!=' use the following format:

expression :: parameter **symbol** parameter

Where

Parameter	A local variable, an OPC tag, a constant, or another expression
Symbol	< or > or <= or >= or == or !=

Result

The expression results in a Boolean value (0 or 1).

Examples

Symbol	Description	Example	Result
<	Less than	~~var1~~ < ~~var2~~	8<3 = 0
>	Greater than	~~var1~~ > ~~var2~~	8>3 = 1
<=	Less than or equal to	~~var1~~ <= ~~var2~~	8<=3 = 0
>=	Greater than or equal to	~~var1~~ >= ~~var2~~	8>=3 = 1
==	Equal to	~~var1~~ == ~~var2~~	8==3 = 0
!=	Not equal to	~~var1~~ != ~~var2~~	8!=3 = 1

Logical

The symbols '&&' and '||' use the following format:

expression :: parameter **symbol** parameter

The symbol '!' uses the following format:

expression :: **symbol** parameter

Where

Parameter	A local variable, an OPC tag, a constant, or another expression
Symbol	&& or || or !

Result

The expression results in a Boolean value (0 or 1).

Truth table

~~var1~~	0		not 0	
~~var2~~	0	not 0	0	not 0
~~var1~~ && ~~var2~~	0	0	0	1
~~var1~~ || ~~var2~~	0	1	1	1
!~~var1~~	1	1	0	0

Examples

Symbol	Description	Example	Result
&&	And	~~var1~~ && ~~var2~~	8 && 3 = 1
||	Or	~~var1~~ || ~~var2~~	8 || 3 = 1
!	Not	!~~var1~~	!8 = 0

Bitwise

The symbols '&', '|', and '^' of the bitwise group use the following format:

expression :: parameter **symbol** parameter

The symbol '~' of the logical group uses the following format:

expression :: **symbol** parameter

The symbols 'shl' and 'shr' of the bitwise group use the following format:

expression :: **symbol** (value, shift by)

Where

Parameter	A local variable, an OPC tag, a constant, or another expression
Symbol	&& or || or ^ or shl or shr or ~

Result

The expression results in a number when the parameters used contain numbers.

Bit Table

	Binary (Decimal)	Binary (Decimal)
~~var1~~	0000.0000.0000.1000 - (8)	0000.0000.0110.0000 - (96)
~~var2~~	0000.0000.0000.1010 - (10)	0000.0000.0000.1000 - (8)
~~var1~~ & ~~var2~~	0000.0000.0000.1000 - (8)	0000.0000.0000.0000 - (0)
~~var1~~ | ~~var2~~	0000.0000.0000.1010 - (10)	0000.0000.0110.1000 - (104)
~~var1~~ ^ ~~var2~~	0000.0000.0000.0010 - (2)	0000.0000.0110.1000 - (104)
shl (~~var1~~,3)	0000.0000.0100.0000 - (64)	0000.0011.0000.0000 - (768)
shr (~~var1~~,3)	0000.0000.0000.0001 - (1)	0000.0000.0000.1100 - (12)
~(~~var1~~)	1111.1111.1111.0111 - (-9)	1111.1100.1111.1111 - (-97)
bittest(~~var1~~,3)	0000.0000.0000.0001 - (1)	0000.0000.0000.0000 - (0)

Examples

Symbol	Description	Example	Result
&	Bit And	~~var1~~ & ~~var2~~	8 && 3 = 0
|	Bit Or	~~var1~~ | ~~var2~~	8 || 3 = 11
^	Bit eXclusive Or	~~var1~~ ^ ~~var2~~	8^3=11
shl	Bit shift left	shl(~~var1~~,3)	8<<3=64
shr	Bit shift right	shr(~~var1~~,3)	8>>3=1
~	Not (two's complement)	~(~~var1~~)	!8 = -9
bittest	Bit Test	bittest (5 , 0)	1

Note: The bittest function requires you to specify the position of the bit to be tested. You must indicate that it starts from 0. In other words, a bit position of "0" indicates the "less significant" bit.

Functions

The symbols 'sin', 'asin', 'cos', 'acos', 'tan', 'atan', 'log', 'ln', 'exp', 'sqrt', 'abs', 'ceil', and 'floor' use the following format:

expression :: **symbol** (parameter)

The symbols 'pow', 'min', and 'max' use the following format:

expression :: **symbol** (parameter,parameter)

The symbol 'if' uses the following format:

expression :: **symbol** (parameter,parameter,parameter)

Where

Parameter	A local variable, an OPC tag, a constant, or another expression
Symbol	sin, asin, cos, acos, tan, atan, log, ln, exp, sqrt, abs, ceil, floor, min, max, pow, or if

Result

The expression results in a number.

Examples

Symbol	Description	Example	Result
sin	sine of an angle in radians	sin(~~var1~~)	sin(0.785)=0.71
cos	cosine of an angle in radians	cos(~~var1~~)	cos(0.785)=0.71
tan	tangent of an angle in radians	tan(~~var1~~)	tan(0.785)=1.0
asin	arc sine returns an angle in radians	asin(~~var1~~)	asin(0.5)=0.52
acos	arc cosine returns an angle in radians	acos(~~var1~~)	acos(0.5)=1.05
atan	arc tangent returns an angle in radians	atan(~~var1~~)	atan(1)=0.785
sqrt	Returns the square root	sqrt(~~var1~~)	sqrt(100)=10
pow	Returns value 1 raised to the power value 2	pow(~~var1~~,~~var2~~)	pow(100,1.5)=1000
log	10 based logarithm	log(~~var1~~)	log(100)=2
ln	*e* based logarithm	ln(~~var1~~)	ln(7.389)=2
exp	Exponential	exp(~~var1~~)	exp(2)=7.389
abs	Absolute value	abs(~~var1~~)	abs(-1)=1
ceil	Integer ceiling	ceil(~~var1~~)	ceil(7.39)=8
floor	Integer floor	floor(~~var1~~)	floor(7.39)=7
min	Lowest value of two	min(~~var1~~,~~var2~~)	min(10,5)=5
max	Highest value of two	max(~~var1~~,~~var2~~)	min(10,5)=10

Symbol	Description	Example	Result
`if`	Conditional statement	`if(~~var1~~<~~var2~~, ~~var1~~,~~var2~~)`	`if(5<8,5,8)=5`
`like`	Wildcard string compare	`Like(string, pattern, casesensitive')`	
`quality`	Quality of tag or expression	`See below.`	`See below.`
`tostring`	Type conversion	`See below.`	`See below.`
`0x`	Hexadecimal constant	`x=0x11`	`17`
`0t`	Octal constant	`x=0t11`	`9`
`0b`	Binary constant	`x=0b11`	`3`

Note: For the like operator: "string" equals the string to search in; "pattern" equals the string to search for (can include wildcards); nonzero for case-sensitive search; zero for case-insensitive search. String syntax is $"string"$.

You can use these special characters in pattern matches in string:

- ? Any single character.
- Zero or more characters.
- # Any single digit (0-9).
- [charlist] Any single character in charlist.
- [!charlist] Any single character not in charlist.

Quality

The **quality** option on the **Functions** menu of the **Expression Editor** is used to evaluate the quality of an OPC tag or an expression.

The following general syntax is used for quality expressions:

x=quality(expression)

Note: The "(expression)" can also be a simple expression composed of a single tag.

The **quality** function returns the OPC quality of the string between parentheses as one of the following results:

- 192: quality is GOOD
- 64: quality UNCERTAIN
- 0: quality BAD

Note: The OPC Foundation establishes the value ranges for quality. There are actually varying degrees of quality:

- GOOD: 192-252
- UNCERTAIN: 64-191
- BAD: 0-63

For more information, refer to the *OPC Data Access Custom Interface Standard* available for download at the OPC Foundation's Web site, www.opcfoundation.org/.

Example Quality Expression

Expression	Result
x=quality({{SMAR.Simulator.1\SimulatePLC.PumpStatus}})	192 (Quality GOOD)

The quality of an expression is determined through the evaluation of each single tag in the expression. Thus, if you have multiple tags in an expression (and each tag has a different quality), the result of the expression (i.e. 192 [GOOD], 64 [BAD], or 0 [UNCERTAIN]) corresponds to the quality of the tag with the lowest quality. If an expression contains a conditional statement (e.g. if,

then, or else), then the result of the expression is affected only by the quality of the branch being executed.

Consider the following sample expression:

x= if (quality({{Tag1}}) == 192, {{Tag1}}, {{Tag2}})

This expression can be read as follows:

"If the quality of Tag1 is GOOD (i.e. 192), then the expression result (x) is the value of Tag1. In all other cases (i.e. the quality of Tag1 is UNCERTAIN or BAD), the expression result (x) is the value of Tag2."

We can calculate the results for this expression using different qualities for Tag1 and Tag2, as shown in the table below.

Case	Tag1 quality	Tag2 quality	Result	Result quality
1	GOOD	GOOD	Tag1	192 (GOOD)
2	GOOD	UNCERTAIN	Tag1	192 (GOOD)
3	GOOD	BAD	Tag1	192 (GOOD)
4	UNCERTAIN	GOOD	Tag2	192 (GOOD)
5	UNCERTAIN	UNCERTAIN	Tag2	64 (UNCERTAIN)
6	UNCERTAIN	BAD	Tag2	0 (BAD)
7	BAD	GOOD	Tag2	192 (GOOD)
8	BAD	UNCERTAIN	Tag2	64 (UNCERTAIN)
9	BAD	BAD	Tag2	0 (BAD)

In cases 1-3 above, the quality of Tag1 is GOOD, and therefore the result of the expression is GOOD. Thus, the result of the expression is not affected by the quality of Tag2 (the “else” branch of the expression), which is ignored.

In cases 4-6, the quality of Tag1 is UNCERTAIN, and therefore the result of the expression is the quality of Tag2.

In cases 7-9, the quality of Tag1 is BAD, and therefore the result of the expression is the quality of Tag2.

Note: The “quality()” function returns a value that represents the quality of the expression within the parentheses but is always GOOD_QUALITY. For example, if Tag1 is BAD_QUALITY then the expression “x=quality({{Tag1}})" will return 0 with GOOD_QUALITY.

The result of an expression is the minimum quality of the evaluated tag in the expression and is affected only by the quality of the conditional (if, then, or else) branch that is executed.

Consider the following sample expression:

x= if ({{TAG_01}}>0,{{TAG_02}},{{TAG_03}})

This expression can be read as follows:

"If the value of TAG_01 is greater than 0, then the expression result (x) is TAG_02. If the value of TAG_01 is less than or equal to 0, then the expression result (x) is TAG_03."

Let's assume that the following values and qualities for these tags:

TAG_01=5 with quality GOOD

TAG_02=6 with quality UNCERTAIN

TAG_03=7 with quality BAD

Because the value of TAG_01 is 5 (greater than 0), the expression result is TAG_02. Thus, the final expression result is 6, and the final expression quality is UNCERTAIN.

Type Conversion

The **tostring** option on the **Functions** menu of the **Expression Editor** takes the value of whatever item is in parentheses and converts it into a string as follows:

The value is +(value)+unit

It can be used to convert from number to string, and it can be very useful for string concatenation.

The proper syntax for the **tostring** option is:

x=$"The value is "$ + tostring(value) + $" unit"$

Note: In the expression above, the word "unit" is placeholder text for a user-specified unit of measurement or variable (e.g. Watt, inches, meters, etc.).

Example Expressions Type Conversion

Expression	Result
x=$"The value is "$ + tostring({{gfwsim.ramp.float}}) + $" Watt"$	“The value is 543.2345152 Watt”

Constants

The **Functions** menu of the **Expression Editor** supports constant values, including hexadecimal, octal, and binary formats.

Example Expressions Using Constants

EXPRESSION	RESULT
x=0x11	17
x=0t11	9
x=0b11	3

The **Expression Editor** conveniently inserts the 0x and 0t and 0b prefixes for you so do not have to recall them.

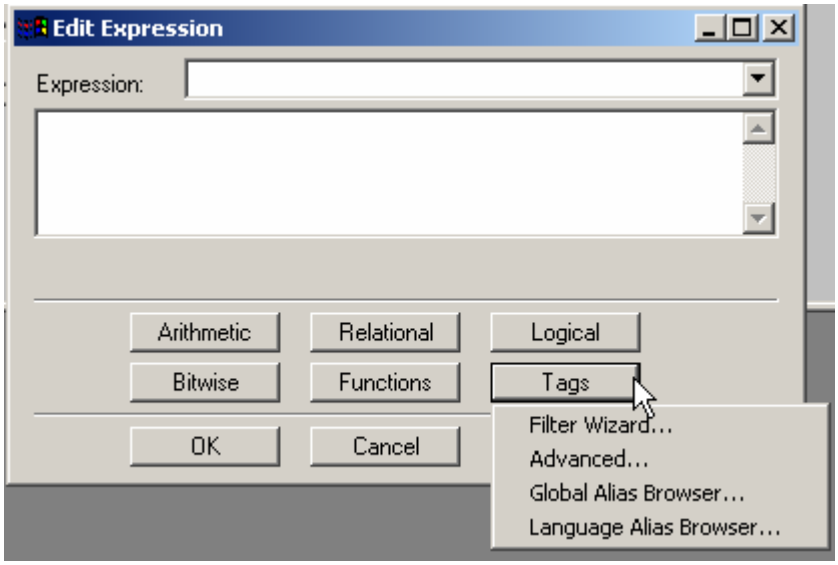
Interpreting and Translating Constants

The examples below show how values are calculated for each type of constant.

- **Hexadecimal:** 0x20A = 2 * (16^2) + 0 * (16^1) + 10 * (16^0) = 2*256 + 0*16 + 10 * 1 = 512 + 0 + 10 = 522
- **Octal:** 0t36= 3 * (7^1) + 6 *(7^0) = 3* 7 + 6* 1= 21 + 6 = 27
- **Binary:** 0b110 = 1 * (2^2) + 1 * (2^1) + 0 * (2^ 0) = 1 * 4 + 1 * 2 + 0 * 1 = 4+2+0 = 6

Tags

The menu options available under the **Tags** button of the Expression Editor are shown in the figure below. The **Expression Editor** dialog box can also be used to create and edit alarm filters. The Expression Editor provides a **Filter Wizard** and an **Alarm Tag** list to help you create simple alarm filters. If you want to customize your alarm filters, you can use the other functions in the Expression Editor to set up your alarm filters manually.

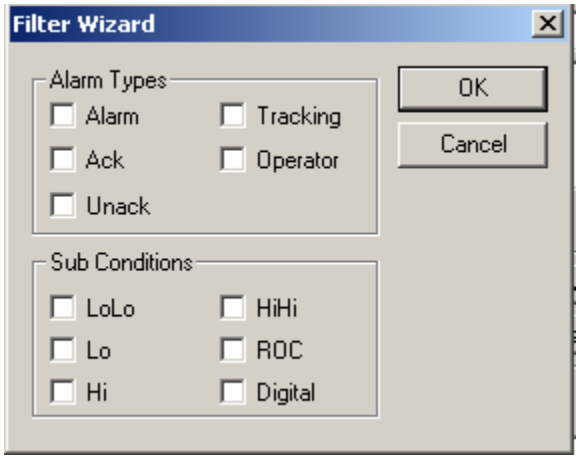


Creating Alarm Filters Using the Expression Editor

Filter Wizard

The **Filter Wizard,** shown in the figure below, allows you to choose from the following to items enter in your expression. Select one or more items, and then click **OK.** The filter string is automatically inserted into the **Edit Expression** dialog box.

- **Alarm Types:** Alarm, Acknowledgement, Unacknowledgement, Tracking, and Operator
- **Subconditions:** LoLo, Lo, Hi, HiHi, Rate of Change, and Digital



Filter Wizard

Selecting Alarm Attributes

Selecting **Advanced** from the **Tags** menu of the Expression Editor opens the **Alarm Tag** list, shown in the figure below, which allows you to choose alarm attributes for your alarm filter. Select the attribute that you want to include in the filter expression and click **OK.**

Alarm Attributes List

There are two additional attributes available for use in filtering: **Alarm Type** and **Current Time.** The Alarm Type attribute allows you to filter alarms according to ALARM 1, ACK 2, UNACK 3, OPER 4, TRACK 5 or NORM 6. For example, you can set up a filter with the condition:

X = {{AlarmType}}

If the **Alarm Type** is true, then the alarms are displayed. If they are false then, the alarms are not displayed.

The **Current Time** attribute allows you to filter according to the current time. Only alarms occurring around the current time will be displayed.

Example Alarm Filters

Expression	Result
X = {{Severity}} > 500.	Only alarm messages with a severity greater than 500 will be visible.
X = Like({{Source}}, $"Tag"$,0)	Only messages with the tag in the source name will be displayed.
X = 1.	Filter displays all messages.
X = 0.	Filter does not display any messages.

All filters resolve to TRUE or FALSE. All nonzero values resolve to TRUE.

Global Aliases

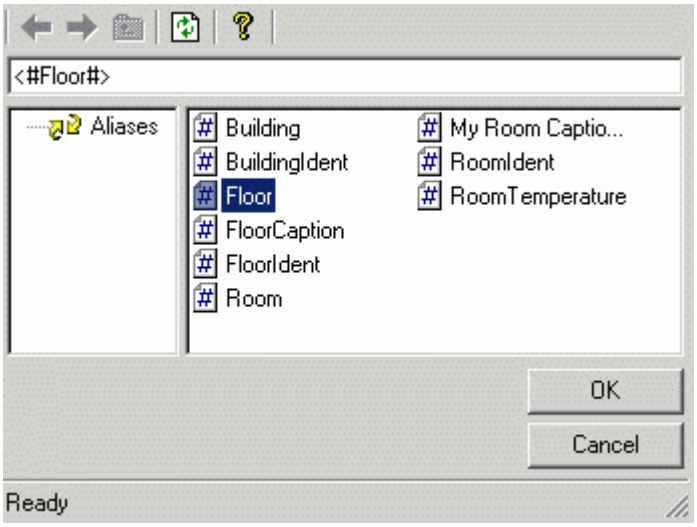
For global aliases within the expression, use the following syntax:

<#global_alias_name**#>**

Example:

x=<#RoomTemperature#>

Selecting **Global Alias Browser** opens the Global Alias Browser, as shown in the figure below. Select a global alias from the Global Alias Browser, which includes all global aliases in the global alias database. This eliminates the need to manually type in the alias name. All global aliases that are configured in the Global Alias Engine Configurator are conveniently available to choose from inside the browser. The tree control of the Global Alias Engine Configurator is mimicked in the tree control of the Global Alias Browser. Select a global alias by double-clicking the alias name (e.g. "Floor" in the figure below). The alias name appears at the top of the browser, which automatically adds the <# and #> delimiters to the alias name. Click the **OK** button.



Selecting an Alias From the Global Alias Browser

Language Aliases

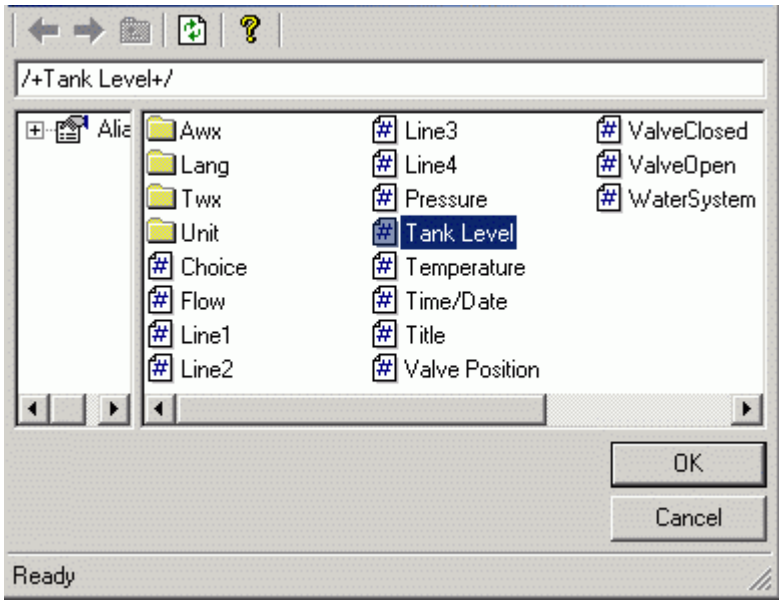
For language aliases within the expression, use the following syntax:

/+language_alias_name**+/**

Example:

x=/+WaterSystem+/

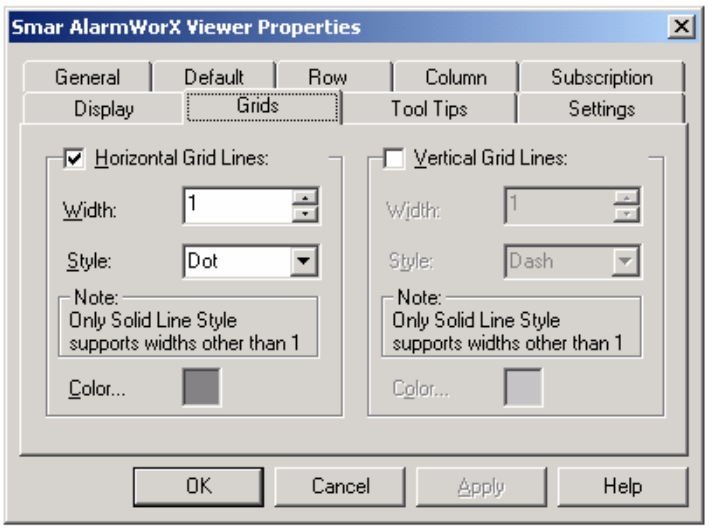
Selecting **Language Alias Browser** from the pop-up menu opens the Language Alias Browser, as shown in the figure below. The browser includes all languages aliases in the language database. All language aliases that are configured in the Language Configurator are conveniently available to choose from inside the browser. The tree control of the Language Configurator is mimicked in the tree control of the Language Alias Browser. Select a language alias by double-clicking the alias name. The alias name appears at the top of the browser, which automatically adds the /+ and +/ delimiters to the alias name. Click the **OK** button.



Selecting an Alias From the Language Alias Browser

Grids

The **Grids** tab of the **Alarm Viewer ActiveX Properties** dialog box, shown below, configures the appearance of the grid lines that appear on the Alarm Viewer.



Alarm Viewer ActiveX Properties: Grids Tab

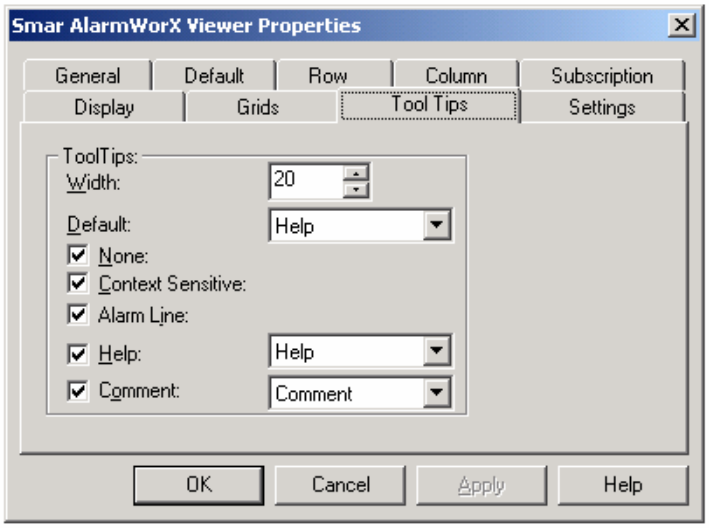
Configure the following grid settings:

- **Colors:** Specifies colors for the grid text, headers, and background.
- **Grid Lines:** Both **Horizontal** and **Vertical** grid lines appear on the alarm report. You can specify the **Width, Style** (e.g. Solid, Dashed, etc.), and **Color** of the grid lines. To change the color of the grid lines, simply click the **Color** check box and select a color from the color palette.

Note: It is not necessary to have grid lines, but it is helpful in distinguishing between different records.

ToolTips

The **ToolTips** tab of the **Alarm Viewer ActiveX Properties** dialog box, shown below, allows you to determine which ToolTip options will be available during runtime by selecting the corresponding check boxes.



Alarm Viewer ActiveX Properties: ToolTips Tab

The **Width** field determines the width of the ToolTip when it is shown in the display.

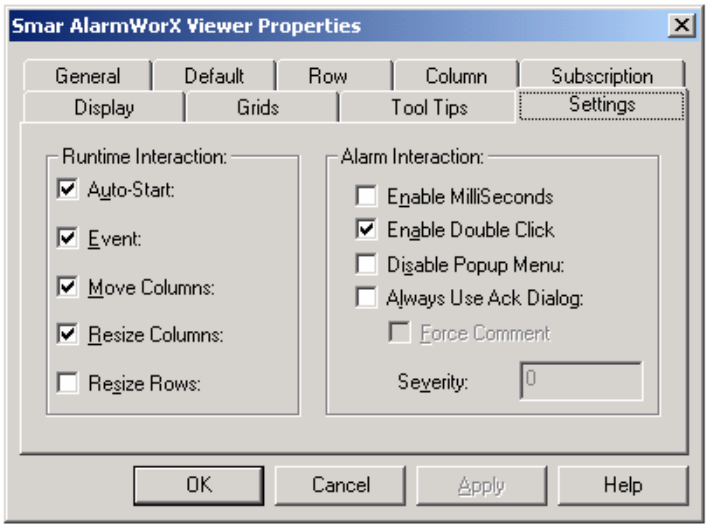
The **Default** field allows you to select the following ToolTips that will be the default in runtime:

- **None:** No ToolTips.
- **Context:** Context information ToolTips.
- **Help:** Displays the information associated with the column configured for help. This is set in the **Settings** tab of the **Alarm Viewer ActiveX Properties** dialog box.
- **Comment:** Displays the information associated with the column configured for comment. This is set in the **Settings** tab of the **Alarm Viewer ActiveX Properties** dialog box.
- **Alarm Line:** Displays the entire alarm line.

Both the **Help** and **Comment** fields have corresponding drop-down list boxes that determine which columns will be displayed for these selections.

Settings

The **Settings** tab of the **Alarm Viewer ActiveX Properties** dialog box, shown below, configures how runtime will be started and which functions will be enabled once it has. It also contains settings for alarm interactions.



Alarm Viewer ActiveX Properties: Settings Tab

Checking the **Auto-Start** check box triggers the server to start runtime when the container is activated. Checking the **Event** check box enables the automation event trigger (VB event) during runtime. The 'Always Use Ack Dialog' forces the user to acknowledge all alarms through the Acknowledge Alarm dialog.

Runtime Interaction

Checking the **Auto-Start** check box triggers the server to start runtime when the container is activated.

Checking the **Event** check box enables the automation event trigger (VB event) during runtime.

Checking the **Move Columns** check box enables you to change the order of the columns in runtime. Selecting a column header and moving it to the new location achieves this in runtime. Additionally, you can decide if columns and rows can be resized while in runtime mode by checking **Resize Columns** or **Resize Rows.**

Alarm Interaction

When **Enable Milliseconds** is checked, milliseconds will be displayed after time in the Time/Date column of the viewer during runtime mode.

When **Enable Double Click** is checked, double-clicking an alarm during runtime acknowledges only the row double-clicked if the **CTRL** key is not pressed down.

When **Disable Popup Menu** is checked, the right-click menu acknowledgement options will not be available during runtime mode.

When **Always Use Ack Dialog** is checked, the user is forced to acknowledge all alarms through the **Acknowledge Alarm** dialog. When **Force Comment** is checked and an alarm is acknowledged, the alarm cannot be acknowledged until a comment is entered in the **Comments** field of the **Acknowledge Alarm** dialog. The **Force Comment** function applies to alarms with a severity level that is greater than or equal to the **Severity** setting.

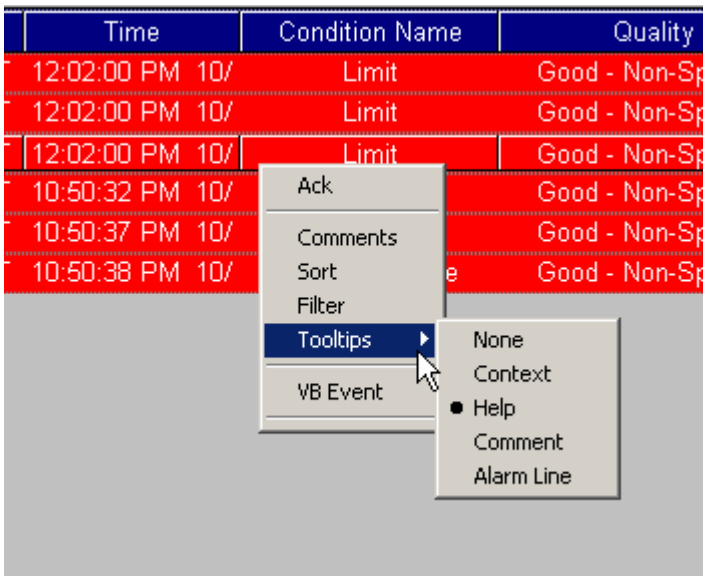
Runtime Operations

During runtime mode, the AlarmWorX Viewer ActiveX provides support for the following functions:

- Alarm acknowledgement
- Operator comments
- Sorting
- ToolTips
- VB event
- Application
- Display

As you can see in the figure below, these functions become available when you right-click on an alarm line during runtime mode. The selected alarm has a 3-D look so you can distinguish it from the other alarm lines, as shown in the figure below.

Note: You can also left mouse click and drag the cursor to select and acknowledge multiple alarm lines.



Runtime Operations

Note: When the scroll bar is moved from the top position, the Alarm Viewer enters a "freeze" mode. This mode will enable a user to scroll without having the alarm sorting interfere with reading the alarm viewer. All alarms that existed before the user entered freeze mode are displayed. This includes any change of state for those alarms. If one of these alarms enters a normal state while the viewer is in freeze mode, a placeholder line will be used to maintain visual placement. All alarms that did not exist before freeze mode are processed for beep, header flash, and automation support, but are not displayed visually. In freeze mode, the header of the alarm viewer will flash if any alarm is not visible.

Alarm Acknowledgement

When an alarm is sent from the server to the viewer, it will remain there until it is acknowledged in some way. The process of acknowledgement involves communication between the Alarm Viewer ActiveX and the subscribed Alarm OPC Server from which the alarm signals are coming. The initial communication results in the alarm signal, which appears in the Current Alarms Viewer. Once you acknowledge an alarm, an **ack** message is sent to the appropriate server. The server then posts the new state of the alarm (i.e. "acknowledged") to the viewer. The alarm line is then updated with the new information. Events are removed during the acknowledgement process if included in the list of items to be acknowledged. The Alarm and Event servers do not receive communication for event removal. There are several ways in which an alarm or event can be acknowledged.

Note: The alarm header will flash whenever there is an unacknowledged alarm that is not visible in the window.

Point Acknowledgement

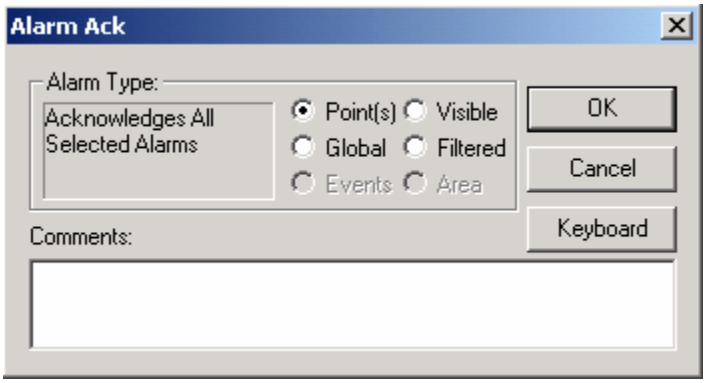
Point acknowledgement will acknowledge all alarms currently selected. To select and acknowledge more than one alarm, hold the control key down and left mouse click on all rows of interest, right mouse click, select point, and then click **OK.** A left double mouse click will also acknowledge all selected points if the control key is held down.

Note: The row that is under the mouse on a right-click is selected if no other rows are currently selected.

Double-clicking an alarm during runtime (if this option is selected in the **Settings** tab of the **Alarm Viewer Properties** dialog box) acknowledges only the row double-clicked on if the **CTRL** key is not pressed down.

Right-clicking and selecting **Ack** during runtime opens the **Alarm Ack** dialog box, as shown in the figure below.

Note: You can also left mouse click and drag the cursor to select and acknowledge multiple alarm lines.



Acknowledging Alarms

The **Alarm Type** field allows you to see which type of alarm you are acknowledging. Clicking the **OK** button acknowledges a particular alarm.

Note: The **Global, Visible, Filtered,** and **Area** acknowledgements are described below.

If a different user acknowledges the alarm, the alarm will appear to automatically acknowledge.

Clicking the **Keyboard** button opens the keypad, which allows operators to key in information directly on the screen.

Global Acknowledgement

When you choose **Global** from the **Alarm Ack** dialog, you are acknowledging all alarms received up to that point. An advantage of using this option is that it quickly clears all alarms from the current view.

Visible Acknowledgement

The **Visible** option allows the user to acknowledge all visible alarms. Thus, if the size of the viewer allows for five alarms to be seen and a total of eight alarms are coming in, only the five visible alarms will be acknowledged. If there are more alarms than the visible ones, a scroll bar will appear on the right-hand side of the viewer.

Filtered Acknowledgement

The **Filtered** option allows the user to acknowledge all filtered alarms. This differs from global acknowledgement in the fact that filtered acknowledgement does not acknowledge locally filtered alarms.

Note: Filtered acknowledgement is only available in version 6.0 and later. In earlier versions, this option behaves the same as global acknowledgement.

Area Acknowledgement

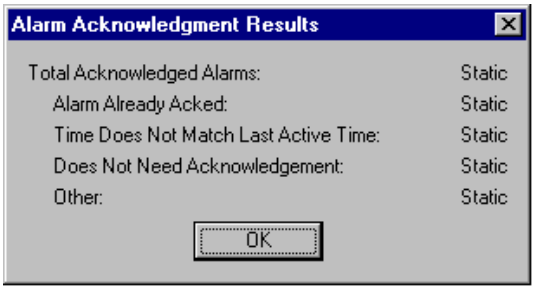
The **Area** option allows the user to acknowledge all alarms that have the same area as the alarm that was selected.

Event Removal

Selecting **Events** on the Alarm Acknowledgement dialog box removes all event messages from the viewer.

Double Acknowledging an Alarm

It is not possible to acknowledge an alarm more than once, but since the alarm does not immediately disappear from the viewer once it is acknowledged, it is possible for a user to try to acknowledge an alarm twice. When this occurs, the user will see the results dialog box shown below.



Alarm Acknowledgement Results

Total Acknowledged Alarms: Provides information about the number of alarms acknowledged.

Alarm Already Acked: Counts the number of alarms attempted to be acknowledged but were already acknowledged. This can occur if the alarm is acknowledged by another client before the acknowledge message is received by the client.

Time Does Not Match Last Active Time: The number of alarms that were attempted to be acknowledged but did not contain the most recent alarm timestamp. This can occur if the alarm being acknowledged is not the most recent state of the alarm. This will occur if the acknowledge message is sent before an update of the current alarm state is received by the client.

Does Not Need Acknowledgement: The number of messages that did not require acknowledgement. This can occur if an acknowledgement is attempted on a non-condition message.

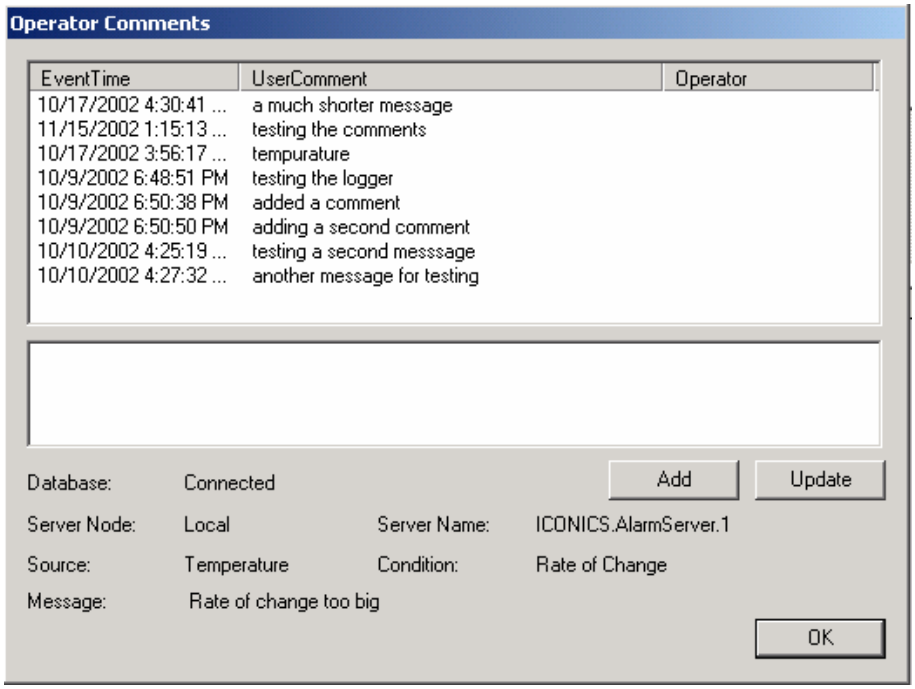
Other: The number of messages that produced a non-OPC alarm acknowledgement COM error. Persistent occurrences of this problem could be due to a bad network connection or erroneous alarm message.

The Alarm Viewer will detect the current state of an alarm and will not attempt to acknowledge an alarm that is already marked as acknowledged. No dialog will be posted for this occurrence.

To clear the message, simply click the **OK** button.

Operator Comments

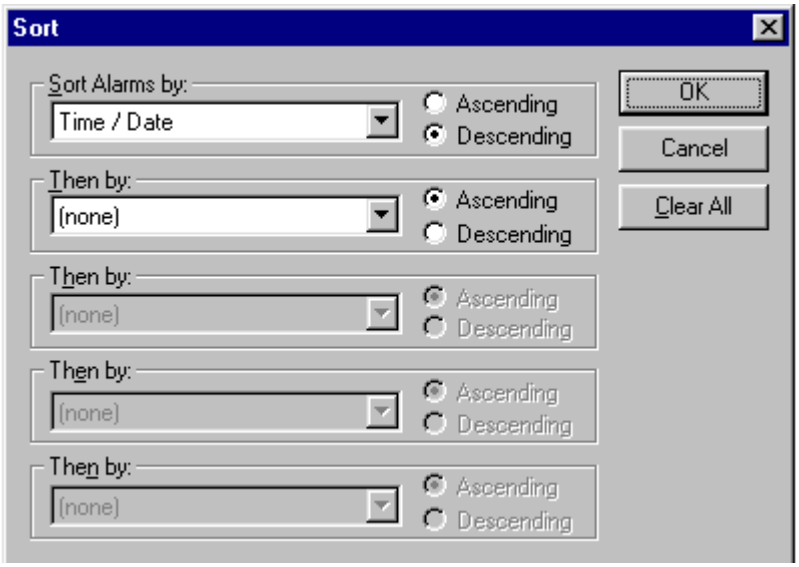
Selecting **Comments** from the Runtime menu opens the **Operator Comments** dialog box, as shown in the figure below. This dialog describes the alarm line the user selected, and it provides a method for entering one or multiple operator comments in a text field. It also indicates whether the user is currently connected to the operator comments database. Clicking the **Add** button logs these comments to a database using the Event Logger. The dialog displays all past operator comments for the alarm selected under the Time, Comment, and Operator columns. The Event Logger is mandatory for operator comments.



Entering Operator Comments

Sorting

Selecting **Sorting** from the Runtime menu opens the **Sort** dialog box, as shown in the figure below.



Sorting Alarms

The **Sort Alarms by** section indicates the first criteria the Alarm Viewer should use when sorting all current alarms. The following **Then by** sections indicate how the viewer should sort alarms that have the same value for the criteria selected in the first section.

Note: It is not necessary to have any values listed in the **Then by** sections.

The **Sort** dialog allows you to configure which criteria to sort the alarms by. It also allows for multilevel sorting up to five levels with ascending/descending specific to each level. The Alarm Viewer will always sort. The default sort for a new viewer is **Time/Date.**

Sort Ascending sorts the data in the column in ascending order (i.e. from least to greatest).

Sort Descending sorts the data in the column in ascending order (i.e. from greatest to least).

Note: The **Sort** dialog, including any configuration, is also available in runtime.

ToolTips

The **Default** of the ToolTips tab of the Alarm Viewer ActiveX Properties dialog box determines which of the following ToolTips that will be the default in runtime:

- **None:** No ToolTips.
- **Context:** Context information ToolTips.
- **Help:** Displays the information associated with the column configured for help. This is set in the **Settings** tab of the **Alarm Viewer ActiveX Properties** dialog box.
- **Comment:** Displays the information associated with the column configured for comment. This is set in the **Settings** tab of the **Alarm Viewer ActiveX Properties** dialog box.
- **Alarm Line:** Displays the entire alarm line.

VB Event

This option allows a user to trigger an automation event during runtime mode. Using this event requires VBA programming tied to the user event.

Display Option

This option only appears if the Alarm Viewer creates the display list by checking the extra attributes field for the registered file types. This attribute is server-specific (for example, when using the SMAR Alarm OPC Server, select **Default Display**). All displays configured for a particular alarm will be displayed. Selecting one, by clicking on the attribute cell, launches the display.

Application

This option only appears if the user selects the extra attribute associated with it. This attribute is server-specific (for example, when using the SMAR Alarm OPC Server, select **Default Display**). This allows the user to launch applications (i.e. *.exe, *.com or *.bat files) by clicking on the corresponding attribute cell.

OLE Automation

Introduction

This reference describes the OLE Automation features available in the AlarmWorX Viewer ActiveX.

Automation Interfaces

The AlarmWorX Viewer ActiveX provides a COM interface that allows automation interfaces run from within the ActiveX container to manipulate the Viewer as it is running. The interface is available to all programming languages that support COM including Microsoft Visual Basic (VB), Visual Basic for Applications (VBA) and Microsoft Visual C^{++}.

To access the automation interface from VB and VBA, the AlarmWorX Viewer must be made available by choosing **Project - Components** from the main menu in the VB or VBA development environment and selecting **AWXVIEW ActiveX** in the list of available components.

Available Control Properties

boolean Check

Description

Enable/Disable URL file support.

Remarks

If check is True URL file support is enabled. FileEnabled must also be True. URL file support is only available for loading.

Example

```
AWXVIEW32OCX1.Check = True
```

boolean FileEnabled

Description

Enable/Disable file storage

Remarks

If FileEnabled is True, file support is enabled. File support conisists of loading and saving configuration information to a file other than the container document. It is recommended that the LoadSaveFile Method be used instead.

Example

```
AWXVIEW32OCX1.FileEnabled = True
```

BSTR Caption

Description

String used for Title

Remarks

This property has no function at this time.

BSTR Filename

Description

Name of the file to load/save

Remarks

If FileEnabled is True, file support is enabled. The Filename is the name of the file and the path of the file to load and save configuration information to. File names must have an .awv extension. It is recommended that the LoadSaveFile Method be used instead.

Example

Sets the file name

```
AWXVIEW32OCX1.Filename = "C:\test.awv"
```

Gets the file name

```
Dim Name as String
Name = AWXVIEW32OCX1.Filename
```

BSTR UrlPath

Description

Name of the URL path and file to load from

Remarks

The UrlPath is the name of the file and the path of the file to load configuration information from. File names must have an .awv extension. Please note that configuration information cannot be saved to a URL file.

Example

Sets the URL file name

```
AWXVIEW32OCX1.UrlPath = "http:\12.13.150.2\test.awv"
```

Gets the URL file name

```
Dim Name as String
Name = AWXVIEW32OCX1.UrlPath
```

boolean AutoSize

Description

Enable/Disable AutoSize as default sizing method.

Remarks

AutoSize determines the base size of a column based on the size of the header text of that column.

Example

```
AWXVIEW32OCX1.AutoSize = True
```

boolean DispRow

Description

Enable/Disable displaying row header

Remarks

Displaying the row header enables an operator to change the row width size during runtime. This property can be used to with the NumRowCheck property to provide a numerical value for each row.

Example

```
AWXVIEW32OCX1.DispRow = True
```

boolean ManSize

Description

Enable/Disable Manual Size as default size

Remarks

Enabling this property will prevent the viewer from altering the sizes of any columns except for the last column. Use this property if you wish to manually set base column sizes.

Example

```
AWXVIEW32OCX1.AutoSize = False
```

boolean NumRowCheck

Description

Enable/Disable numbering row header. Only enabled when DispRow is Enabled.

Remarks

Use this property in conjunction with the DispRow property to display a number for each alarm line.

Example

Example displays the number of each alarm line

```
AWXVIEW32OCX1.DispRow = True
AWXVIEW32OCX1.NumRowCheck = True
```

boolean Scale

Description

N/A

Remarks

This property has no function at this time.

boolean Title

Description

N/A

Remarks

This property has no function at this time.

boolean WrapText

Description

Enable/Disable text wrapping. Only visible when row size is greater than 1.

Remarks

Enabling this property causes the all column text to wrap to the next line. The wrap effect is contained within each individual column cell. Please note that this effect is only visible if the RowSize property is greater than 1 and the text information is larger than one column length.

Example

This example sets the Column height to 2 and enables text wrapping.

```
AWXVIEW32OCX1.WrapText = True
AWXVIEW32OCX1.RowSize = 2
```

long MaxLength

Description

Sets default cell length.

Remarks

This property will set all columns in the viewer to the sizes specified (excluding the last column). Use this property if you wish to set all base column sizes to the same size.

Example

```
AWXVIEW32OCX1.MaxLength = 10
```

JUSTIFY BaseJustify

Description

Sets default justification.

Remarks

This property sets the base justification for each column. It makes use of the enumerated values JustifyCenter, JustifyLeft, JustifyRight. The second half of the enumerated value name denotes they type of justification. For example JustifyCenter would center the text for each column.

Example

AWXVIEW32OCX1.BaseJustify = JustifyCenter

long RowSize

Description

Sets base Row height.

Remarks

This property directly effect how much of the screen space is taken up for each row.

Example

This example sets the Column height to 2.

```
AWXVIEW32OCX1.RowSize = 2
```

OLE_COLOR BackColor

Description

Sets the default background color

Remarks

This color is used for the base background color of each row (excluding row and column headers).

RGB defines colors in the order of red, green, blue. A good trick to use when picking colors is to open a graphics package and use the color palate to determine the RGB numbers. This will allow a visual representation of the color and provide the exact corresponding RGB values.

Example

```
AWXVIEW32OCX1.BackColor = RGB(255, 255, 255)
```

OLE_COLOR HeaderColor

Description

Sets the default Header color

Remarks

RGB defines colors in the order of red, green, blue. A good trick to use when picking colors is to open a graphics package and use the color palate to determine the RGB numbers. This will allow a visual representation of the color and provide the exact corresponding RGB values.

Example

```
AWXVIEW32OCX1.HeaderColor = RGB(255, 255, 255)
```

OLE_COLOR TextColor

Description

Sets the default text color

Remarks

RGB defines colors in the order of red, green, blue. A good trick to use when picking colors is to open a graphics package and use the color palate to determine the RGB numbers. This will allow a visual representation of the color and provide the exact corresponding RGB values.

Example

```
AWXVIEW32OCX1.TextColor = RGB(255, 255, 255)
```

OLE_COLOR GridColor

Description

Sets the default background color

Remarks

This color is used for all grid space not covered by a row.

RGB defines colors in the order of red, green, blue. A good trick to use when picking colors is to open a graphics package and use the color palate to determine the RGB numbers. This will allow a visual representation of the color and provide the exact corresponding RGB values.

Example

```
AWXVIEW32OCX1.BackColor = RGB(255, 255, 255)
```

GRIDLINE HStyle

Description

Sets horizontal grid style

Remarks

Grid styles other than solid can not have widths greater than 1. Also some grid styles, other than solid, have trouble printing on some printers.

GRIDLINE is an enumerated list containing the following values: GridLineDash, GridLineDashdot, GridLineDashdotdot, GridLineDot, GridLineSolid.

Example

Example of a valid grid style and width settings

```
AWXVIEW32OCX1.HStyle = GridLineSolid
AWXVIEW32OCX1.HWidth = 2

AWXVIEW32OCX1.HStyle = GridLineDot
AWXVIEW32OCX1.HWidth = 1
```

GRIDLINE VStyle

Description

Sets vertical grid style

Remarks

Grid styles other than solid can not have widths greater than 1. Also some grid styles, other than solid, have trouble printing on some printers.

GRIDLINE is an enumerated list containing the following values: GridLineDash, GridLineDashdot, GridLineDashdotdot, GridLineDot, GridLineSolid.

Example

Example of a valid grid style and width settings

```
AWXVIEW32OCX1.VStyle = GridLineSolid
AWXVIEW32OCX1.VWidth = 2

AWXVIEW32OCX1.VStyle = GridLineDot
AWXVIEW32OCX1.VWidth = 1
```

boolean HCheck

Description

Enable/Disable horizontal grid lines

Example

```
AWXVIEW32OCX1.HCheck = True
```

boolean VCheck

Description

Enable/Disable vertical grid lines

Example

```
AWXVIEW32OCX1.VCheck = True
```

long HWidth

Description

Sets horizontal grid line width

Remarks

Grid styles other than solid cannot have widths greater than 1. Also some grid styles, other than solid, have trouble printing on some printers.

Example

Example of a valid grid style and width settings

```
AWXVIEW32OCX1.HStyle = GridLineSolid
AWXVIEW32OCX1.HWidth = 2

AWXVIEW32OCX1.HStyle = GridLineDot
AWXVIEW32OCX1.HWidth = 1
```

long VWidth

Description

Sets vertical grid line width

Remarks

Grid styles other than solid can not have widths greater than 1. Also some grid styles, other than solid, have trouble printing on some printers.

Example

Example of a valid grid style and width settings

```
AWXVIEW32OCX1.VStyle = GridLineSolid
AWXVIEW32OCX1.VWidth = 2

AWXVIEW32OCX1.VStyle = GridLineDot
AWXVIEW32OCX1.VWidth = 1
```

OLE_COLOR HorColor

Description

Sets horizontal grid line color

Remarks

RGB defines colors in the order of red, green, blue. A good trick to use when picking colors is to open a graphics package and use the color palate to determine the RGB numbers. This will allow a visual representation of the color and provide the exact corresponding RGB values.

Example

```
AWXVIEW32OCX1.HorColor = RGB(255, 255, 255)
```

OLE_COLOR VerColor

Description

Sets vertical grid line color

Remarks

RGB defines colors in the order of red, green, blue. A good trick to use when picking colors is to open a graphics package and use the color palate to determine the RGB numbers. This will allow a visual representation of the color and provide the exact corresponding RGB values.

Example

```
AWXVIEW32OCX1.VerColor = RGB(255, 255, 255)
```

boolean AutoStart

Description

Enable/Disable AutoStart feature

Remarks

AutoStart allows the viewer to enter a runtime state when the container has AmbientUserMode set to True.

Example

```
AWXVIEW32OCX1.AutoStart = True
```

boolean NoToolTips

Description

Enable/Disable NoToolTips as runtime option

Remarks

Setting this property to False will gray out the NoToolTips option on the right click runtime pop-up menu.

Example

```
AWXVIEW32OCX1.NoToolTips = False
```

boolean Help

Description

Enable/Disable Help ToolTips as runtime option

Remarks

Setting this property to False will gray out the Help option on the right click runtime pop-up menu.

Example

```
AWXVIEW32OCX1.Help = False
```

boolean Event

Description

Enable/Disable Event ToolTips as runtime option

Remarks

Setting this property to False will gray out the Event option on the right click runtime pop-up menu.

Example

```
AWXVIEW32OCX1.Event = False
```

boolean Context

Description

Enable/Disable Context ToolTips as runtime option

Remarks

Setting this property to False will gray out the Context option on the right click runtime pop-up menu.

Example

```
AWXVIEW32OCX1.Context = False
```

boolean Comment

Description

Enable/Disable Comment ToolTips as runtime option

Remarks

Setting this property to False will gray out the Comment option on the right click runtime pop-up menu.

Example

```
AWXVIEW32OCX1.Comment = False
```

boolean AlarmLine

Description

Enable/Disable entire alarm line popup ToolTips as runtime option

Remarks

Setting this property to False will gray out the AlarmLine option on the right click runtime pop-up menu.

Example

```
AWXVIEW32OCX1.AlarmLine = False
```

TOOLTIP DefaultTooltip

Description

Set default ToolTip setting for runtime.

Remarks

This property sets ToolTip to use on startup. Valid ToolTip values are as follows:

- PopupAlarmLine
- PopupComment
- PopupContext
- PopupHelp
- PopupNone

Example

AWXVIEW32OCX1.Comment = False

short TooltipWidth

Description

Set tooltip width.

Remarks

Longer ToolTip widths will cause the ToolTip to have fewer rows.

Example

AWXVIEW32OCX1.TooltipWidth = 15

long CommentHeader

Description

Defines a header to associate with the Comment pop-up ToolTips

Remarks

This call should be used in conjunction with the position of the desired header. This causes the comment option to display the information in the associated column.

Example

```
Dim Val1 As Integer
Val1 = AWXVIEW32OCX1.ColumnNametoPosition("Column1")
AWXVIEW32OCX1.CommentHeader = Val1
```

long HelpHeader

Description

Defines a header to associate with the Help pop-up ToolTips

Remarks

This call should be used in conjunction with the position of the desired header. This causes the help option to display the information in the associated column.

Example

```
Dim Val1 As Integer
Val1 = AWXVIEW32OCX1.ColumnNametoPosition("Column1")
AWXVIEW32OCX1.HelpHeader = Val1
```

boolean AlarmDouble

Description

Enable/Disable left mouse double click to acknowledge alarms

Example

```
AWXVIEW32OCX1.AlarmDouble = False
```

boolean AckDialog

Description

Enable/Disable the forcing of alarm acknowledgement through ack dialog.

Remarks

Enabling this property forces all acknowledgements through the ack dialog. This differs from the AlarmDouble property in the fact that a double click with AckDailog set to true will bring up the acknowledge dialog.

Example

```
AWXVIEW32OCX1.AckDialog = False
```

boolean EnableMoveCol

Description

Enable/Disable the changing of column order during runtime

Example

```
AWXVIEW32OCX1.EnableMoveCol = True
```

boolean EnableResizeCol

Description

Enable/Disable the resizing of columns during runtime

Remarks

This feature should only be used for design and testing due to the fact that it would allow the user to completely hide a column of information.

Example

```
AWXVIEW32OCX1.EnableResizeCol = True
```

boolean EnableResizeRow

Description

Enable/Disable the resizing of rows during runtime

Remarks

This feature should only be used for design and testing due to the fact that it would allow the user to completely hide alarm lines.

Example

```
AWXVIEW32OCX1.EnableResizeRow = True
```

BSTR SelectedSource

Description

Returns the selected source string. Source name is chosen based on messages selected, alarm state, severity, and time

Remarks

This property will return the source string (tag name) that best fits the following criteria:

1) Highlighted alarm line.
2) Highest alarm state.
3) Highest severity.
4) Most recent time stamp.

Alarm state priority is defined as follows:

1) In Alarm and unacknowledged
2) In Alarm but acknowledged
3) Passed out of Alarm but unacknowledged
4) Tracking message
5) Operator message

Example

```
Dim SourceName As String
SourceName = AWXVIEW32OCX1.SelectedSource
MsgBox (SourceName)
```

BSTR PrioritySource

Description

Return the priority source string. Source name is chosen based on messages in alarm, severity, and time.

Remarks

This property returns a source name (tag name) that best fits the following criteria:

1) In alarm.
2) Highest severity.
3) Most recent time stamp.

If no alarm messages are in alarm and unacknowledged this property will return an empty string.

Example

```
Dim SourceName As String
SourceName = AWXVIEW32OCX1.PrioritySource
MsgBox (SourceName)
```

Available Control Methods

boolean ShowColumn(COLIMNID ColumnId, boolean bShow)

Description

This method will hide and show columns. If bShow is True it will attempt to show the column. Return a True on success.

Example

This example shows the column alarm type

```
Dim bVal as Boolean
bVal = AWXVIEW32OCX1.ShowColumn(ALARMTYPE,True)
```

boolean SetToolTip(TOOLTIP Id)

Description

This method will set the current Tooltip mode to the type associated with TOOLTIP id.

Remarks

See the DefaultTooltip property for TOOLTIP id list.

Example

```
Dim bVal as Boolean
bVal = AWXVIEW32OCX1.SetToolTip(PopupAlarmline)
```

boolean SortOn(short Count, COLIMNID Sort1, boolean Direction1, COLIMNID Sort2, boolean Direction2, COLIMNID Sort3, boolean Direction3, COLIMNID Sort4, boolean Direction4, COLIMNID Sort5, boolean Directon5)

Description

Sorts grid. Pass in columnID and direction combinations to set up sort. Count is the number of items to sort on. Pass zero for all unused parameters. The first pair can not be zero. Returns true on success. A direction of True causes accending order.

Remarks

The count parameter is used to determin how many columnID and direction pairs to use for sorting.

Example

This example causes the grid to be sorted first by alarm type and then by time. The effect is to have the earliest most recent alarms on top and the oldest operator messages on the bottom.

```
Dim bVal as Boolean
bVal = AWXVIEW32OCX1.SortOn(2, ALARMTYPE, True, AEACTIVETIME,False , 0,
0, 0, 0, 0, 0)
```

boolean SetColumnName(BSTR Name, short Pos)

Description

This method sets the name of the column located at the position passed in.

Remarks

Column position can change due to runtime user interaction or script. Please be aware that column position counts hidden columns when doing calculations.

Example

```
Dim bVal As Boolean
bVal = AWXVIEW32OCX1.SetColumnName("NewCol1",3)
```

short ColumnNametoPosition(BSTR Name)

Description

Pass in string name (Case sensitive) returns column position. A return of zero is a failure.

Remarks

Column position can change due to runtime user interaction or script. Please be aware that column position counts hidden columns when doing calculations.

Example

```
Dim ColPos as Integer
ColPos = AWXVIEW32OCX1.ColumnNametoPosition("Column1")
```

short ColumnNametoId(BSTR Name)

Description

Pass in string name (Case sensitive) returns column id. A Value of zero is a failure.

Remarks

The column id value corresponds to the following list:

AECHANGEMASK = 0,

AENEWSTATE = 1,

AESOURCE = 2,

AETIME = 3,

AEMESSAGE = 4,

AEEVENTTYPE = 5,
AEEVENTCATEGORY = 6,
AESEVERITY = 7,
AECONDITIONNAME = 8,
AESUBCONDITIONNAME = 9,
AEQUALITY = 10,
AEACKREQUIRED = 11,
AEACTIVETIME = 12,
AECOOKIE = 13,
AENUMEVENTATTRS = 14,
AEACTORID = 15,
ATTRIB1 = 16,
ATTRIB2 = 17,
ATTRIB3 = 18,
ATTRIB4 = 19,
ATTRIB5 = 20,
ATTRIB6 = 21,
ATTRIB7 = 22,
ATTRIB8 = 23,
ATTRIB9 = 24,
ATTRIB10 = 25,
ATTRIB11 = 26,
ATTRIB12 = 27,
ATTRIB13 = 28,
ATTRIB14 = 29,
ATTRIB15 = 30,
ATTRIB16 = 31,
ATTRIB17 = 32,
ATTRIB18 = 33,
ATTRIB19 = 34,
ATTRIB20 = 35,
ALARMTYPE = 36,

Example

```
Dim ColId as Integer
ColId = AWXVIEW32OCX1. ColumnNametoId("Column1")
```

BSTR IdtoColumnName(COLIMNID Id)

Description

Pass in columnID. Returns string name.

Remarks

See ColumnNametoId function for Id list.

Example

```
Dim ColName as String
ColName = AWXVIEW32OCX1.IdtoColumnName(AEACTIVETIME)
```

BSTR PositiontoColumnName(short Position)

Description

Pass in position. Returns string name.

Remarks

Column position can change due to runtime user interaction or script. Please be aware that column position counts hidden columns when doing calculations.

Example

```
Dim ColName as String
ColName = AWXVIEW32OCX1.PositiontoColumnName(2)
```

long GetNumberofAlarms()

Description

Returns current number of items in alarm.

Example

```
Dim Val1 As Integer
Val1 = AWXVIEW32OCX1.GetNumberofAlarms()
```

long GetNumberofAcked()

Description

Returns current number of items in acknowledged state.

Example

```
Dim Val1 As Integer
Val1 = AWXVIEW32OCX1.GetNumberofAcked()
```

long GetNumberofUnacked()

Description

Returns current number of items in unacknowledged state.

Example

```
Dim Val1 As Integer
Val1 = AWXVIEW32OCX1.GetNumberofUnacked()
```

long GetNumberofTracking()

Description

Returns current number of tracking items.

Example

```
Dim Val1 As Integer
Val1 = AWXVIEW32OCX1.GetNumberofTracking()
```

long GetNumberofOperator()

Description

Returns current number of operator items.

Example

```
Dim Val1 As Integer
Val1 = AWXVIEW32OCX1.GetNumberofOperator()
```

long GetTotalNumberofMessages()

Description

Returns total number of current messages.

Example

```
Dim Val1 As Integer
Val1 = AWXVIEW32OCX1.GetNumberofMessages()
```

long GetNumberofFilterAlarms()

Description

Returns current number of items in alarm that pass through the client filter.

Example

```
Dim Val1 As Integer
Val1 = AWXVIEW32OCX1.GetNumberofFilterAlarms()
```

long GetNumberofFilterAcked()

Description

Returns current number of items in acknowledged state that pass through the client filter.

Example

```
Dim Val1 As Integer
Val1 = AWXVIEW32OCX1.GetNumberofFilterAcked()
```

long GetNumberofFilterUnacked()

Description

Returns current number of items in unacknowledged state that pass through the client filter.

Example

```
Dim Val1 As Integer
Val1 = AWXVIEW32OCX1.GetNumberofFilterUnacked()
```

long GetNumberofFilterTracking()

Description

Returns current number of tracking items that pass through the client filter.

Example

```
Dim Val1 As Integer
Val1 = AWXVIEW32OCX1.GetNumberofFilterTracking()
```

long GetNumberofFilterOperator()

Description

Returns current number of operator items that pass through the client filter.

Example

```
Dim Val1 As Integer
Val1 = AWXVIEW32OCX1.GetNumberofFilterOperator()
```

long GetTotalNumberofFilterMessages()

Description

Returns total number of current messages that pass through the client filter.

Example

```
Dim Val1 As Integer
Val1 = AWXVIEW32OCX1.GetNumberofFilterMessages()
```

short PositiontoId(short Pos)

Description

Pass in position returns column ID.

Remarks

Column position can change due to runtime user interaction or script. Please be aware that column position counts hidden columns when doing calculations.

Example

```
Dim Val1 As Integer
Val1 = AWXVIEW32OCX1.PositiontoId(2)
```

short IdtoPosition(COLIMNID Id);

Description

Pass in column ID return position.

Remarks

Column position can change due to runtime user interaction or script. Please be aware that column position counts hidden columns when doing calculations.

Example

```
Dim Val1 As Integer
Val1 = AWXVIEW32OCX1.IdtoPosition(AEACTIVETIME)
```

boolean SizeColAtPosition(short Pos, long Size);

Description

Pass in position and new size, changes size of column at that position. Return of true means success. Size must be larger than minimum width as seen in property pages. (equal to or larger than 1)

Remarks

Column position can change due to runtime user interaction or script. Please be aware that column position counts hidden columns when doing calculations. Width values are based on an internal algorithm composed of font size and type

Example

Changes column in position 2 to a width of 15

```
Dim bVal As Boolean
bVal = AWXVIEW32OCX1.SizeColAtPosition(2,15)
```

boolean SizeColWithId(COLIMNID Id, long Size)

Description

Pass in column ID and new size, changes size of column at that position. Return of true means success. Size must be larger than minimum width as seen in property pages. (equal to or larger than 1)

Remarks

Width values are based on an internal algorithm composed of font size and type

Example

Changes the time column to a width of 15

```
Dim bVal As Boolean
bVal = AWXVIEW32OCX1.SizeColWithId(AEACTIVETIME,15)
```

boolean MovCol(short FromStartPos, short FromEndPos, short ToPos)

Description

Move columns. FromStartPos is first column selected. FromEndPos is last column selected. Moves group of columns to ToPos. Cannot move past last column. Return of True means success.

Remarks

Please be aware that column position counts hidden columns when doing calculations.

Example

This Example will move columns 3, 4, and 5 in front of column 2.

```
Dim bVal As Boolean
bVal = AWXVIEW32OCX1.MovCol(3,5,2)
```

boolean EnableColTextColorOverride(COLIMNID Id, boolean Enable)

Description

Change text color for specified column. Enable = true enables override. Return true on success.

Example

This Example enables the text color of the time column to be overwritten and then changes the text color.

```
Dim bVal As Boolean
bVal = AWXVIEW32OCX1.EnableColTextColorOverride(AEACTIVETIME,  True)
Call AWXVIEW32OCX1.SetColTextColor(AEACTIVETIME,RGB(255,255,255))
```

boolean EnableColBackColorOverride(COLIMNID Id, boolean Enable)

Description

Changes background color for specified column. Enable = true enables override. Returns true on success.

Example

This Example enables the background color of the time column to be overwritten and then changes the background color.

```
Dim bVal As Boolean
bVal = AWXVIEW32OCX1.EnableColBackColorOverride(AEACTIVETIME,  True)
Call AWXVIEW32OCX1.SetColBackColor(AEACTIVETIME,RGB(255,255,255))
```

void SetColTextColor(COLIMNID Id, OLE_COLOR Color)

Description

Sets text color of specified column. Automatically enables text color override.

Remarks

This function will enable the text color to be overwritten.

Example

```
Dim bVal As Boolean
Call AWXVIEW32OCX1.SetColTextColor(AEACTIVETIME,RGB(255,255,255))
```

void SetColBackColor(COLIMNID Id, OLE_COLOR Color)

Description

Sets background color of specified column. Automatically enables background color override.

Remarks

This function will enable the background color to be overwritten.

Example

```
Dim bVal As Boolean
Call = AWXVIEW32OCX1.SetColBackColor(AEACTIVETIME,RGB(255,255,255))
```

OLE_COLOR GetColBackColor(COLIMNID Id)

Description

Returns text color of specified column. - **Note**: this is the override color.

Remarks

This returns the column background color not the base default background color.

Example

```
Dim rcolor As OLE_COLOR
rcolor = AWXVIEW32OCX1.GetColBackColor(AEACTIVETIME)
```

OLE_COLOR GetColTextColor(COLIMNID Id)

Description

Returns background color of specified column. - **Note**: this is the override color.

Remarks

This returns the column text color not the base default text color.

Example

```
Dim rcolor As OLE_COLOR
rcolor = AWXVIEW32OCX1.GetColTextColor(AEACTIVETIME)
```

boolean EnableRowTextColor(MESSAGETYPE wType, long LowSeverity, boolean Enable)

Description

Enables/Disables text color override for associated message type and rowID. Enable = True enables override. Returns true on success.

Remarks

The messagetype values are as follows:

- Alarm = 1
- Acknowledge = 2
- Unacknowledge = 3
- Operator = 4
- Tracking = 5
- Normal = 6

Example

This Example will disable the setting of the row text color for all alarm lines in alarm for severity values starting at 400 to the next configured severity or 1000. Which ever is less.

Dim bVal As Boolean

```
bVal = AWXVIEW32OCX1.EnableRowTextColor(Alarm,400,False)
```

boolean EnableRowBackColor(MESSAGETYPE wType, long LowSeverity, boolean Enable)

Description

Enables/Disables background color override for associated message type and rowID. Enable = True enables override. Returns true on success.

Remarks

See EnableRowTextColor method for available messagetype values.

Example

This Example will disable the setting of the row background color for all alarm lines in alarm for severity values starting at 400 to the next configured severity or 1000. Which ever is less.

```
Dim bVal As Boolean
bVal = AWXVIEW32OCX1.EnableRowBackColor(Alarm,400,False)
```

void SetRowTextColor(MESSAGETYPE wType, long LowSeverity, OLE_COLOR Color)

Description

Sets text color associated with message type and rowID. Automatically enables text color override.

Remarks

See EnableRowTextColor method for available messagetype values.

Example

This Example will change the row text color for all alarm lines in alarm for severity values starting at 400 to the next configured severity or 1000. Which ever is less.

```
Call  AWXVIEW32OCX1.SetRowTextColor(Alarm,400,RGB(255,255,255))
```

void SetRowBackColor(MESSAGETYPE wType, long LowSeverity, OLE_COLOR Color)

Description

Sets background color associated with message type and rowID. Automatically enables background color override.

Remarks

See EnableRowTextColor method for available messagetype values.

Example

This Example will change the row background color for all alarm lines in alarm for severity values starting at 400 to the next configured severity or 1000. Which ever is less.

```
Call AWXVIEW32OCX1.SetRowBackColor(Alarm,400,RGB(255,255,255))
```

OLE_COLOR GetRowTextColor(MESSAGETYPE wType, long LowSeverity)

Description

Returns the row text color of the associated message type rowID combination. **Note** - this is the override color.

Remarks

See EnableRowTextColor method for available messagetype values.

Example

This example will get the row text color value for severity values starting at 400 to the next configured severity or 1000. Which ever is less.

```
Dim rcolor As OLE_COLOR
rcolor = AWXVIEW32OCX1.GetRowTextColor(Alarm,400)
```

OLE_COLOR GetRowBackColor(MESSAGETYPE wType, long LowSeverity)

Description

Returns the row background color of the associated message type rowID combination. **Note** - this is the override color.

Remarks

See EnableRowTextColor method for available message type values.

Example

This example will get the row background color value for severity values starting at 400 to the next configured severity or 1000. Which ever is less.

```
Dim rcolor As OLE_COLOR
rcolor = AWXVIEW32OCX1.GetRowBackColor(Alarm,400)
```

GlobalAck(BSTR comment)

Description

Acknowledges all received alarms.

Remarks

The comment is passed to the server.

Example

```
Call AWXVIEW32OCX1.GlobalAck("down for maintenance")
```

AckSelectedRows(BSTR comment)

Description

Acknowledges rows selected by the operator.

Remarks

The comment is passed to the server.

Example

```
Call AWXVIEW32OCX1.AckSelectedRows("down for maintenance")
```

void AckDisplayed(BSTR comment)

Description

Acknowledges all displayed alarms

Remarks

This function will acknowledge all alarm messages visible on the screen. The comment is passed to the server.

Example

```
Call AWXVIEW32OCX1.AckDisplayed("down for maintenance")
```

void AckFiltered(BSTR comment)

Description

Acknowledges all alarms that pass through the client filter. This differs from the global acknowledge by the fact that the global acknowledge will also acknowledge requested alarms that the client filter has filtered out.

Remarks

The comment is passed to the server.

Example

```
Call AWXVIEW32OCX1.AckFiltered("down for maintenance")
```

void SetActorID(BSTR Operator, BSTR Station)

Description

Creates string of defining user who acknowledged an alarm. Syntax is as follows user: Operator Node: Station

Remarks

Once ActorID is called the ocx will not get the ActorID from the security system unless resetActorId is called.

Example

```
Call AWXVIEW32OCX1.SetActorID("NewOperator","NewStation")
```

void SetSecurity(long Security)

Description

Allows the AlarmWorX viewer security to be set through an automation interface.

Remarks

Once enabled, Smar security server will not be used for the life of the ocx. The security map is as follows:

m_bSecAckPoint	0x0001
m_bSecGlobalAck	0x0002
m_bSecPageAck	0x0004
m_bSecScreenAck	0x0008
m_bSecAreaAck	0x0010
m_bSecVBEvent	0x0020
m_bSecSort	0x0040
m_bSecFilter	0x0080
m_bSecDetails	0x0100
m_bSecProperty	0x0200
m_bSecApplication	0x0400
m_bSecDisplay	0x0800
m_bSecTooltip	0x1000
m_bSecColumn	0x2000
m_bSecLanguage	0x4000
m_bSecChFilter	0x8000

A 1 enables the feature and a 0 disables the feature. By default all items are disabled.

A registry setting of Security 0 must be added to HKEY_LOCAL_MACHINE\software\Smar\awxview32 for this automation method to be enabled. This registry setting disables the use of the security server for the Alarm viewer.

Example

This Example enables all options except AckPoint (point acknowledge)

```
Dim Security As Integer
Security = 65534 '65534  = 0xfffe
Call AWXVIEW32OCX1.SetSecurity(Security)
```

void ResetActorID()

Description

Sets the Actor ID back to the internal actor id string.

Example

```
Call AWXVIEW32OCX1.ResetActorID()
```

void FilterOff()

Description

Turns off all client filters.

Example

```
Call AWXVIEW32OCX1.ResetActorID()
```

BSTR GetActiveFilter()

Description

Returns the active client fitler name.

Remarks

This is the name of the filter not the filter expression

Example

```
Dim FilterName As String
FilterName = AWXVIEW32OCX1.GetActiveFilter()
```

BSTR GetFilter(LPCTSTR Filter)

Description

Returns the filter expression.

Remarks

Given the name of an existing filter this method will return the filter expression string. An empty string is returned if the filter does not exist.

Example

```
Dim FilterName As String
Dim FilterExpression As String
FilterExpression = AWXVIEW32OCX1.GetFilter(FilterName)
```

boolean SetFilter(LPCTSTR Filter, BSTR Expression)

Description

Creates Filter if Filter does not already exist. Sets Expression as the expression string associated with Filter. Returns a true on success.

Remarks

The best way to ensure accurate expression syntax is to create the string using the client filter dialog and then copy the string expression. This method only adds the filter and filter name to the list of possible client filters. It does not activate the filter.

Example

This example creates a filter named filter1 with an expression that only passes alarms with a source name beginning with Tag.

```
Dim FilterName As String
Dim FilterExpression As String

FilterName = "Filter1"
'actual expression  x=  like({{Source}},$"Tag*"$,0)
FilterExpression = "like({{Source}},$"Tag*"$,0)"
FilterExpression = AWXVIEW32OCX1.SetFilter(FilterName,FilterExpression)
```

boolean EnableFilter(LPCTSTR Filter, boolean State)

Description

Turns Filter on if state is True or off if state is False. Returns true on success.

Remarks

This method will turn filters on and off. When a filter is turned on, the previous filter will be turned off. It is only possible to have one filter running at any given time.

Example

This example turns the filter named filter1 on.

```
Dim FilterName As String
Dim bVal as Boolean
FilterName = "Filter1"
bVal = AWXVIEW32OCX1.EnableFilter(FilterName,True)
```

boolean AlarmFilter(BSTR Filter, long StartSeverity, long EndSeverity, long AlarmType, BSTR AttributeField1, BSTR Attribute1, BSTR AttributeField2, BSTR Attribute2)

Description

Sets Filter with the following syntax:

({{Severity}} >= StartSeverity)&&

({{Severity}} <= EndSeverity)&&

({{AlarmType}} == AlarmType)&&

(like({{Attribute1}},$"AttributeField1"$,0))&&

(like({{Attribute2}},$"AttributeField2"$,0))

Remarks

AlarmType decodes as follows:

- ALARM 1
- ACK 2
- UNACK 3
- OPER 4
- TRACK 5
- NORM 6

An AlarmType of 7 or greater removes alarm type from the filter.

The attribute field compare the string AttributeField with the string found in the column of the associated attribute. Comparison is done using the like function. The like function behaves identically to the VB like operator.

Attibute1 is removed from the filter if AttributeField1 is the string *

Attibute2 is removed from the filter if AttributeField2 is the string *

It is recommended that the SetFilter and EnableFilter methods are used instead of this method.

Example

```
Dim bVal as Boolean
bVal = AWXVIEW32OCX1.AlarmFilter("Filter1",0,1000, Alarm,
"*","extracol1","*","extracol2")
```

void EnterAnimate()

Description

Causes the ActiveX to enter runtime mode.

Example

This example causes the viewer to exit runtime, load file test.awv, and enter runtime.

```
Dim FileName As String
Dim bVal as Boolean

FileName = "c:\test\test.awv"
Call AWXVIEW32OCX1.ExitAnimate()
BVal = AWXVIEW32OCX1.LoadSaveFile(FileName,1)
Call AWXVIEW32OCX1.EnterAnimate()
```

void ExitAnimate()

Description

Causes the ActiveX to exit runtime mode and enter design mode.

Example

This example causes the viewer to exit runtime, load file test.awv, and enter runtime.

```
Dim FileName As String
Dim bVal as Boolean

FileName = "c:\test\test.awv"
Call AWXVIEW32OCX1.ExitAnimate()
BVal = AWXVIEW32OCX1.LoadSaveFile(FileName,1)
Call AWXVIEW32OCX1.EnterAnimate()
```

boolean LoadSaveFile(BSTR FileName, short Load)

Description

Will cause the ActiveX to load or save an *.awv file. If Load is 1 then the file will be loaded. Load 0 will cause the file to be saved.

Remarks

This method will only load or save a file when the ActiveX is in design mode. The ActiveX properties Check must be False and FileEnabled must be True. This should be done through the property pages and saved as part of configuration. To set the property pages to load and save from a file, select Configuration File in the general properties tab and disable URL Path option. FileName should be the full path and filename including extension.

Example

This example causes the viewer to exit runtime, load file test.awv, and enter runtime.

```
Dim FileName As String
Dim bVal as Boolean

FileName = "c:\test\test.awv"
Call AWXVIEW32OCX1.ExitAnimate()
BVal = AWXVIEW32OCX1.LoadSaveFile(FileName,1)
Call AWXVIEW32OCX1.EnterAnimate()
```

```
long ControlSize(long cx, long cy)
```

Description

Sets the size of the ocx. Returns a 0 on success.

Remarks

Cx and cy are in windows pixel units.

Example

```
Dim size As Integer
size = AWXVIEW32OCX1.ControlSize(200,300)
```

boolean ChangeNode(BSTR OldNode, BSTR NewNode)

Description

This method changes the node name associated with the alarm subscription. This method will cause the alarm subscription to switch the network nodes it is using for data collection.

Remarks

There are possible performance hits when using this function.

Example

```
Dim bVal As Boolean
bVal = AWXVIEW32OCX1.ChangeNode("PC12","PC13")
```

void UpdateDisplay()

Description

This method causes a redraw of the internal grid information.

Remarks

This should be used at the end of a script to force the update of automation color changes.

Example

```
Dim bVal As Boolean
Call AWXVIEW32OCX1.SetColBackColor(AEACTIVETIME,RGB(255,255,255))
Call AWXVIEW32OCX1.SetColTextColor(AEACTIVETIME,RGB(255,255,255))
Call AWXVIEW32OCX1.UpdateDisplay()
```

BSTR SelectedColRowInfo(COLIMNID Id)

Description

This method returns a string containing the text in the column corresponding to 'Id' for the row selected in the Alarm Viewer ActiveX.

Example

```
Dim TimeInfo as string
'Get the time of the selected row
TimeInfo = AWXVIEW32OCX1.SelectColRowInfo(AETIME)
```

BSTR ColRowInfo(long Row, COLIMNID Id)

Description

This method takes the row number and column ID as input parameters. It returns the row and column information in the form of a string.

Example

```
Dim s As String
s = AWXVIEW32OCX1.ColRowInfo(1, AESOURCE)
MsgBox (s)
```

This example will pop up a message box with the source of the alarm message.

void ScrollUp();

Description

Scroll up the value of one arrow click

Example

```
AWXVIEW32OCX1.ScrollUp
```

void ScrollDwn();

Description

Scroll down the value of one arrow click

Example

```
AWXVIEW32OCX1.ScrollUp
```

void ScrollPgUp();

Description

Scroll up the value of one scroll bar click

Example

```
AWXVIEW32OCX1.ScrollPgUp
```

void ScrollPgDwn();

Description

Scroll down the value of one scroll bar click

Example

```
AWXVIEW32OCX1.ScrollPgDwn
```

void ScrollLeft();

Description

Scroll left the value of one arrow click

Example

```
AWXVIEW32OCX1.ScrollLeft
```

void ScrollRight();

Description

Scroll right the value of one arrow click

Example

```
AWXVIEW32OCX1.ScrollRight
```

void ScrollPgLeft();

Description

Scroll left the value of one scroll bar click

Example

```
AWXVIEW32OCX1.ScrollPgLeft
```

void ScrollPgRight();

Description

Scroll right the value of one scroll bar click

Example

```
AWXVIEW32OCX1.ScrollPgRight
```

long GetNumberofCol();

Description

Returns the number of columns

Example

```
Dim col As Long
col = AWXVIEW32OCX1.GetNumberofCol()
MsgBox (col)
```

This example will pop up a message box with the number of columns.

void ComputerName();

Description

Returns the local node name

Example

```
Dim s As String
s = AWXVIEW32OCX1.ComputerName()
MsgBox (s)
```

This example will pop up a message box with the computer name.

long GetColSizeAtPosition(short Pos);

Description

Pass in the column position. Returns the size of the column.

Example

```
Dim size As Long
size = AWXVIEW32OCX1.GetColSizeAtPosition(1)
```

```
msgbox (size)
```

This example will pop up a message box with the size of the first column.

long GetColSizeWithId(short Id);

Description

Pass in the column Id. Returns the size of the column.

Example

```
Dim size As Long
size = AWXVIEW32OCX1.GetColSizeWithId(AESOURCE)
MsgBox (size)
```

This example will pop up a message box with the size of the AESOURCE column.

boolean IsEnableRowTextColor(short wType, long LowSeverity);

Description

Pass in the message type and severity. Returns true if the row text color setting is true. Returns false otherwise.

Remarks

See EnableRowTextColor method for available messagetype values.

Example

This example will get the EnableRowTextColor value for severity values starting at 400 to the next configured severity or 1000. Which ever is less.

```
Dim b As Boolean
b = AWXVIEW32OCX1.IsEnableRowTextColor(Alarm,400)
```

boolean IsEnableRowBackColor(short wType, long LowSeverity);

Description

Pass in the message type and severity. Returns true if the row background color setting is true. Returns false otherwise.

Remarks

See EnableRowTextColor method for available messagetype values.

Example

This example will get the EnableRowBackColor value for severity values starting at 400 to the next configured severity or 1000. Which ever is less.

```
Dim b as Boolean
b = AWXVIEW32OCX1.IsEnableRowBackColor(Alarm,400)
```

boolean IsEnableColTextColorOverride(short Id);

Description

Pass in the column Id. Returns true if the column text color setting is true. Returns false otherwise.

Example

```
Dim b as Boolean
b = AWXVIEW32OCX1.IsEnableColTextColorOverride (AESOURCE)
```

boolean IsEnableColBackColorOverride(short Id);

Description

Pass in the column Id. Returns true if the column background color setting is true. Returns false otherwise.

Example

```
Dim b as Boolean
b = AWXVIEW32OCX1.IsEnableColBackColorOverride (AESOURCE)
```

long GetNumberofSelectedRows();

Description

Returns the number of selected rows.

Example

```
Dim l As Long
l = AWXVIEW32OCX1.GetNumberofSelectRows()
MsgBox (l)
```

This example will pop up a message box with the number of selected rows.

void SetGasParentCookie(long newCookie);

Description

For Global Aliasing System (GAS) support only

Remarks

This function is hidden and should not be used through custom scripts

Example

None

boolean SetGASThemes(BSTR strThemes);

Description

For Global Aliasing System (GAS) support only

Remarks

This function is hidden and should not be used through custom scripts

Example

None

Available Control Events

OnRightMouseClick()

Description

Event posted on user right mouse click

Example

```
Private Sub AWXVIEW32OCX1_OnRightMouseClick()
'Your code here
End Sub
```

OnLeftMouseClick()

Description

Event posted on user left mouse click

Example

```
Private Sub AWXVIEW32OCX1_OnLeftMouseClick()
'Your code here
End Sub
```

OnRightMouseDBLClick()

Description

Event posted on user right double mouse click

Example

```
Private Sub AWXVIEW32OCX1_OnRightMouseDblClick()
'Your code here
End Sub
```

OnLeftMouseDBLClick()

Description

Event posted on user left double mouse click

Example

```
Private Sub AWXVIEW32OCX1_OnLeftMouseDblClick()
'Your code here
End Sub
```

OnNewAlarm()

Description

Event posted when any new message enters the viewer.

Remarks

Please Note: This event occurs when any new OPC alarm and events message is passed into the viewer. This includes client filtered messages, operator messages, tracking messages, alarm messages, and acknowledge messages. No information provided to the event that denotes message type.

Example

```
Private Sub AWXVIEW32OCX1_OnNewAlarm()
'Your code here
End Sub
```

OnPopupEvent()

Description

Event posted when the user selects the VB event menu item from the right click pop-up menu.

Example

```
Private Sub AWXVIEW32OCX1_OnPopupEvent()
'Your code here
End Sub
```

Chapter 7

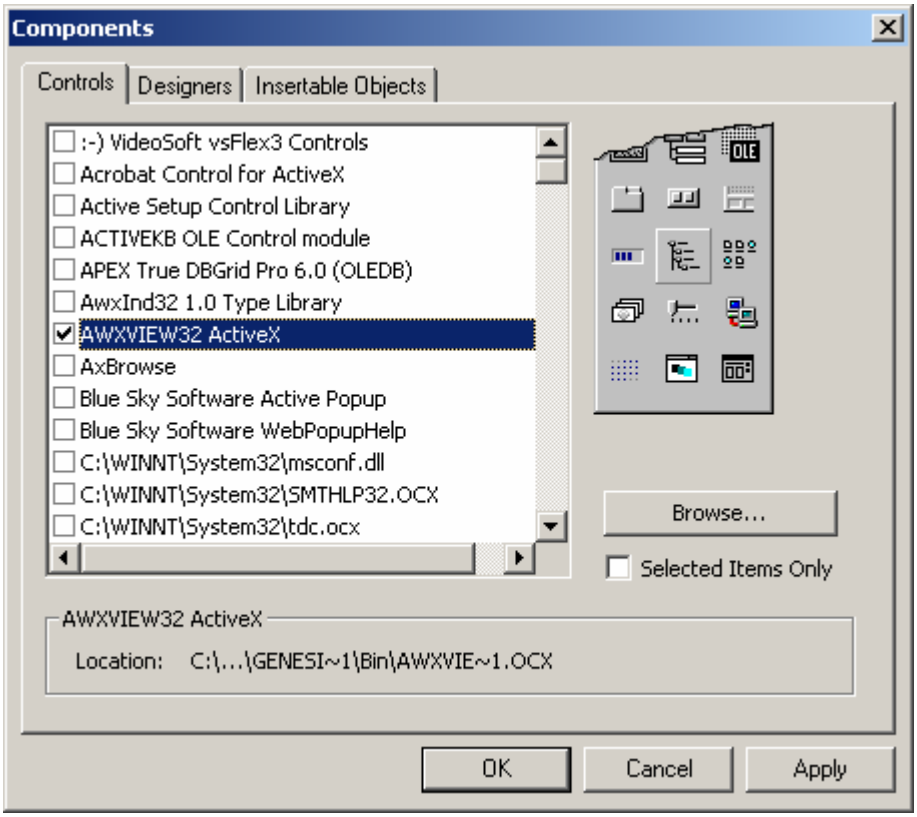
Visual Basic Examples

Introduction

This example describes how to integrate the Alarm Logger when programming in Microsoft Visual Basic (VB). The example shows how to build a form to enable logging and printing.

Getting Started

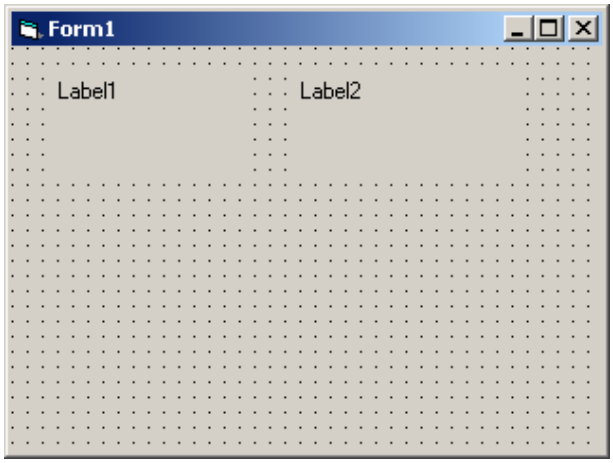
1. Open a new Standard EXE project in Visual Basic. This opens a new blank Visual Basic form.
2. Before adding anything to this form, you must add the AlarmWorX Viewer ActiveX component to your toolbox. To do this, right-click anywhere in the toolbox and select Component from the pop-up menu. This opens the Components dialog box, as shown in the figure below. Select AWXVIEW ActiveX and click OK.
3. You are now ready to begin configuring the interface for the new Visual Basic form.



Components Dialog

Visual Basic Form Configuration

Click the **Label** button in the toolbox and draw two rectangles on the blank VB form that you created earlier. Your form should now look like the figure below.



VB Form With Two Labels

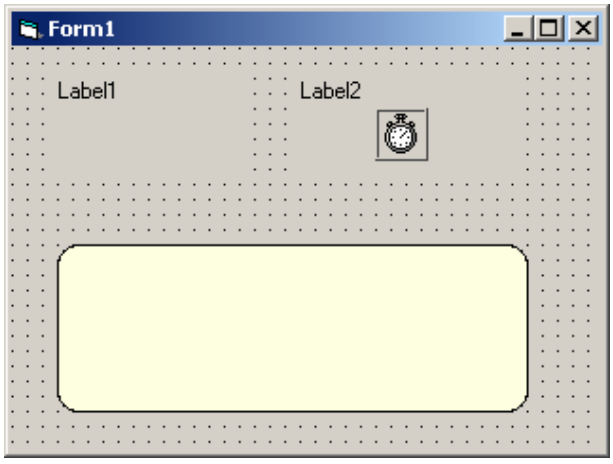
These labels will be referenced in later code so that, while the program is running, the date will be displayed on the field **Label1,** and the time will be displayed on the field **Label2.**

You must now insert a timer object over the **Label2** field.

Click the Timer button in the toolbox and draw a square over the Label2 field. The timer will appear in the form.

Next add a shape where the action buttons will be located.

Click the **Shape** button in the toolbox and insert the shape on the form so that your form looks like the one in the figure below.



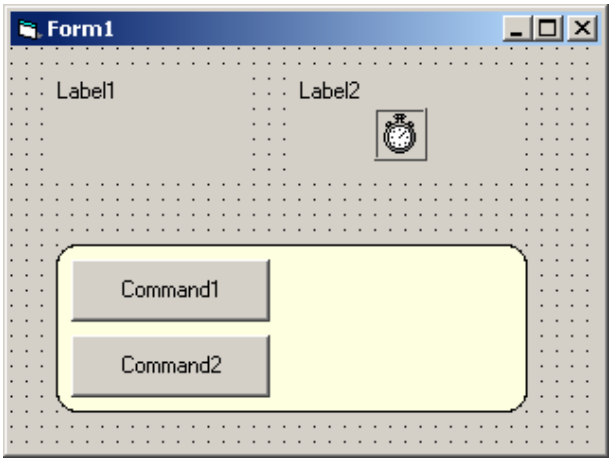
VB Form With Shape and Timer

To configure the shape, select it and then enter the following data in the **Properties** window.

(Name):	Shape1
BackColor:	Clicking the down opens a palette. Select a light color for the back color.
BackStyle:	1 - Opaque
BorderColor:	Choose something dark that will contrast with the Back Color you picked.
BorderStyle:	6 - Inside Solid
BorderWidth:	1
DrawMode:	13 - Copy Pen
FillColor:	Choose the same color as the Back Color
FillStyle:	1 - Transparent
Shape:	4 - Rounded Rectangle

Now you will add the action buttons and text fields on top of the shape.

Click the **CommandButton** button in the toolbox and insert two buttons over the shape that you have just configured. Your form should look like the one in the figure below.



VB Form With Command Buttons

To configure each button, select it and then enter the following data in the **Properties** window.

(Name)	CmdEnableAlarms	CmdEnablePrinting
Appearance:	1 - 3D	1 - 3D
Caption:	&Enable Logging	E&nable Printing

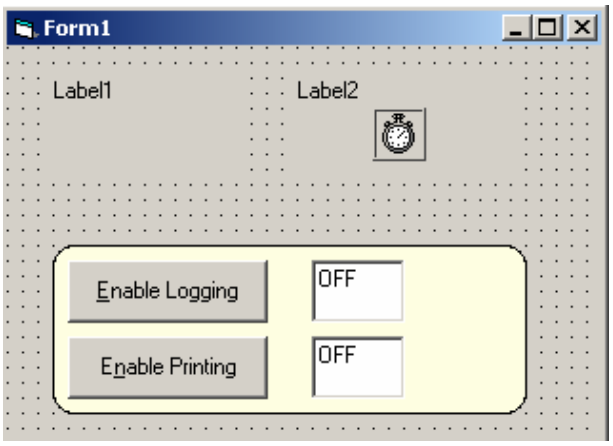
Note: To successfully enable printing, it is necessary to configure a printer in the AlarmWorX Logger.

Click the **TextBox** button in the toolbox and insert two textboxes (one after each button). These text boxes will indicate whether logging and printing are enabled.

To configure each textbox, insert the following data in the properties window:

(Name):	TxtEnableLog	TxtPrinting
Alignment:	0 - Left Justify	0 - Left Justify
Appearance:	1 - 3D	1 - 3D
BorderStyle:	1 - Fixed Solid	1 - Fixed Solid
Font:	MS Sans Serif - 12pt	MS Sans Serif - 12pt
Text:	OFF	OFF

Your form should look like the one in the figure below.



VB Form With Text Boxes

The final button you will add is the **Exit** button, which will effectively exit the user out of this form.

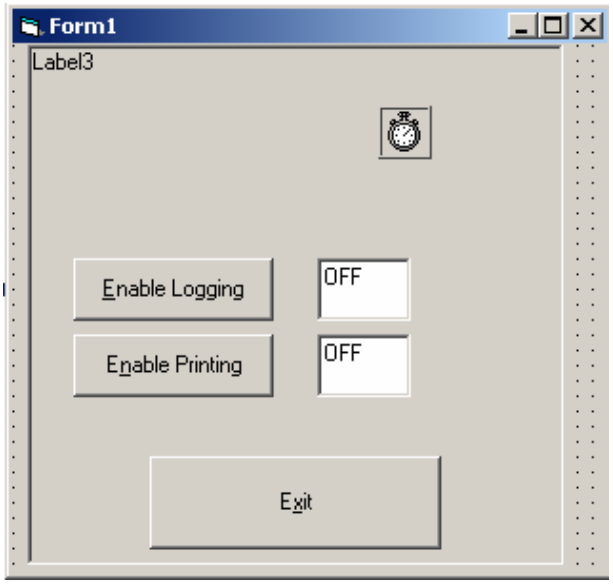
Click the **CommandButton** button in the toolbox and insert a button underneath the previously inserted shape.

To configure the button, enter the following data in the properties window:

(Name):	ComExit
Appearance:	1 - 3D
Caption:	E&xit

For the purposes of appearance and grouping, we will add a label component that will enclose all of the components that were just added.

Click the **Label** button in the toolbox and insert the label so your form looks like the one in the figure below.



VB Form With Exit Button

To configure the label, select it and then enter the following data in the **Properties** window.

	Label3
Alignment	0 - Left Justify
Appearance	1 - 3D
Back Style	1 - Opaque
BorderStyle	1 - Fixed Single

Now it is time to enter the code behind the components!

Entering the VB Code

To enter the code behind a component, double-click on the component. This opens the **Project - Form (Code)** window. Before you enter code for any of the components, enter the following definitions by double-clicking on the form itself:

```
Dim b_LoggingEnabled As Boolean
Dim b_PrintingEnabled As Boolean
Dim Logger As New AWXLogAuto
```

It is important to enter these definitions because they are referenced in later code.

1. The first component for which you will enter the code is the **Enable Logging** button. When selected, this button will turn on or off alarm logging. Double-click the **Enable Logging** button and enter the following code:

```
Private Sub CmdEnabelAlarms_Click()
'will Enablel/Disable AlarmLogger.
On Error GoTo INIT_ERR

If b_LoggingEnabled = False Then 'if its off then swich it on
    b_LoggingEnabled = True
    TxtEnableLog.Text = "ON"
```

```
    Logger.LoggingEnabled = b_LoggingEnabled
Else                        'or, its on then swich it off
    TxtEnableLog.Text = "OFF"
    b_LoggingEnabled = False
    Logger.LoggingEnabled = b_LoggingEnabled
End If

Exit Sub
'
INIT_ERR:
If Err = -2147467259 Then   ' AlarmLogger is not Loaded yet then just waite
    WaitToLoadAlarmLogger
    CmdEnabelAlarms_Click
End If
End Sub

Private Sub WaitToLoadAlarmLogger()
'this function will pause the time for The PauseTime in seconds.
    Dim Start ', count
    PauseTime = 5
    'count = 0
    Start = Timer   ' Set start time.

    Do While Timer < Start + PauseTime
        DoEvents    ' Yield to other processes.
        'count = Timer - Start
    Loop
End Sub
```

2. The next component for which you will enter code is the **Enable Printing** button. When selected, this button will enable or disable printing. Double-click the **Enable Printing** button and enter the following code:

```
Private Sub CmdEnablePrinting_Click()
'will Enable/Disable printing the Alarms.
On Error GoTo INIT_ERR

If b_PrintingEnabled = False Then  'if its off then swich it on
    b_PrintingEnabled = True
    TxtPrinting.Text = "ON"
    Logger.PrintingEnabled = b_PrintingEnabled
Else
    TxtPrinting.Text = "OFF"    'or, its on then swich it off
    b_PrintingEnabled = False
    Logger.PrintingEnabled = b_PrintingEnabled
End If
Exit Sub
'
```

```
INIT_ERR:
If Err = -2147467259 Then   ' AlarmLogger is not Loaded yet then just wait
    WaitToLoadAlarmLogger
    CmdEnablePrinting_Click
End If
End Sub
```

3. Next you will enter the code for the **Exit** button. When selected, this button will exit the user out of the form. Double-click the **Exit** button and enter the following code:

```
Private Sub ComExit_Click()
    Unload Me
End Sub
```

4. Next you will enter the code for the entire form. Double-click the form and enter the following code:

```
Private Sub Form_Initialize()

    b_PrintingEnabled = False 'set the Alarm Printing to OFF.
End Sub

Private Sub Form_Load()
Dim MyDate, MyTime
Dim ob As Object

    Timer1.Interval = 1000  ' Set Timer interval for every second.
    MyDate = Format(Date, "dddd, mmm d yyyy") 'set the DATE format.
    Label1.Caption = MyDate  ' load the current date.

    Screen.MousePointer = vbHourglass
    On Error GoTo INIT_ERR
    If Logger.LoggingEnabled = False Then 'if its off then show it OFF in the TxtEnableLog
            TxtEnableLog.Text = "OFF"
    Else                    'or, its ON then show it OFF in the TxtEnableLog
TxtEnableLog.Text = "ON"

    End If
    Screen.MousePointer = VBDEFULT
Exit Sub

'
INIT_ERR:
If Err = -2147467259 Then   ' AlarmLogger is not Loaded yet then just waite
    WaitToLoadAlarmLogger
    Form_Load
End If

End Sub
```

```
Private Sub Form_Unload(Cancel As Integer)
    Set Logger = Nothing  ' kill the Object Logger.
End Sub
```

5. Now you will enter the code for the **Timer** function. Double-click the **Timer** button and enter the following code:

```
Private Sub Timer1_Timer()
'just to update the Clock at every second.
    Label2.Caption = Time 'Load the current time.
End Sub
```

6. Once you have entered all of the above code, you must save and compile your project. Select **Save As** from the **File** menu and save the project as **VBAlarmTest.exe.** To compile the project, select **Make VBAlarmTest.exe** from the **File** menu.

Chapter 8

AlarmWorX Multimedia

Introduction

AlarmWorX+ Multimedia has long been one of Smar' core products. The success of AlarmWorX+ Multimedia has brought smar numerous customer requests to develop such new features as Video, SMS Support, 2-Way Paging, and Marquees. The result: Smar' creation of its third generation of AlarmWorX Multimedia! This, the most powerful multimedia product available to address market conditions, employs the latest technologies to bring you unsurpassed capabilities.

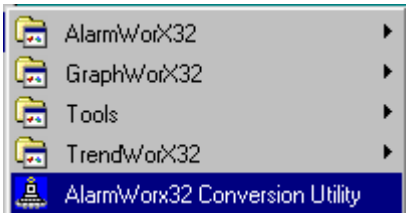
AlarmWorX Multimedia's key features include:

- MAPI-based paging
- TAPI-based telephony support
- Email with 2-way acknowledgment
- URLs and pop-up capabilities to shell out to other apps
- Message-scrolling marquees
- Instant-messenger support
- Prerecorded auditable alarms
- Text-to-speech alarms
- TAP and GSM / SMS support
- Advanced scheduling and personal escalation

To aid the shift of our current AlarmWorX+ customers to the new generation of multimedia products, Smar has created an easy-to-use Conversion Utility. This document describes the necessary procedure for conversion to AlarmWorX+ applications.

The AlarmWorX+ Conversion Utility allows you to translate efficiently older AlarmWorX+ configurations into new distributed enterprise-wide alarm-and-events management using AlarmWorX Multimedia configuration. In this way, you will be able to enjoy the simplicity and power of SMAR' new generation of products.

Note: The AlarmWorX+ Conversion Utility must be installed separately. It is located in the tools directory of the Smar ProcessView V 6.1 or Product CD, as shown below:



Tools Directory

AlarmWorX+ Overview

AlarmWorX+ provides OPC-compliant multimedia technology for remote alarm notification. Connect pagers, PA systems, Voice, E-mail, Fax, and Telephony systems to industry-standard OPC servers.

Voice alarming delivers specific messages quickly and effectively by actually announcing them using speech and sound. It eliminates the confusion of having a single siren or bell represent multiple alarms. AlarmWorX+ is ideal for unattended applications requiring remote alarm notification.

Easily integrate with popular HMI/SCADA or any custom applications using industry-standard OPC Data Access and via OPC automation. Connect to PLCs, DCS Systems, I/O Devices, and open communications bus standards such as Profibus, Interbus, CAN, Devicenet, and many more.

Features include:

- Designed for Windows NT, 95/98/Me, and 2000
- 32-bit multimedia OPC alarming client
- Real-time alarm summary display
- Easy configuration and set-up
- Voice annunciation of alarms
- Support for popular international pagers
- Supports MAPI-based E-mail systems
- Telephone voice systems
- Personnel scheduler
- Historical alarm analysis
- Alarm troubleshooting system
- Supports industry standards interfaces

AlarmWorX+ is an OPC Data compliant multimedia alarming package that is capable of notifying the operator of an alarm through every possible medium. The product is base upon the 16-bit AlarmWorX+ product and reuses much of the same code. However, all of the third-party controls and the code supporting these controls are different.

One of the main features of the new AlarmWorX+ product is the addition of OLE for Process Control (OPC). This functionality allows users to browse points from any OPC-compliant server. Since OPC is an industry standard, it allows greater flexibility for customers who are no longer bound by company specific drivers.

AlarmWorX+ Conversion Utility Compatibility

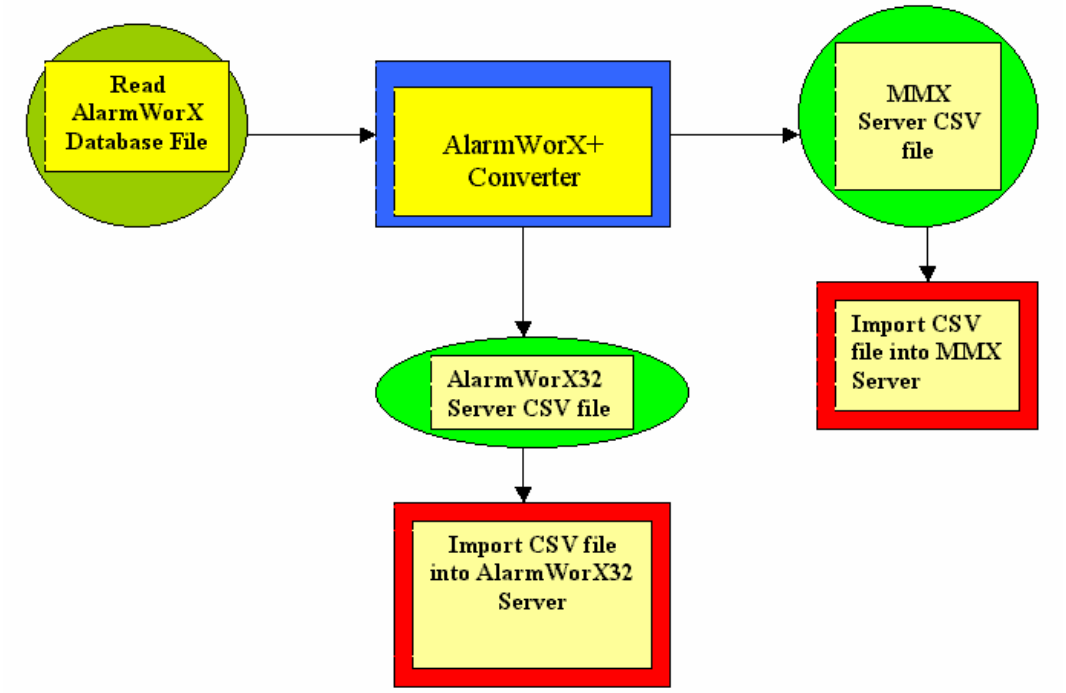
AlarmWorX+ Conversion Utility is compatible with all AlarmWorX+ versions starting from version 5.0. These versions include:

- **AlarmWorX+ 5.0**
- **AlarmWorX+ 5.1**
- **AlarmWorX+ 5.3**
- **AlarmWorX+ 6.0**
- **AlarmWorX+ 6.1**

Note: All versions previous to 5.0 are not compatible with AlarmWorX+ Conversion Utility.

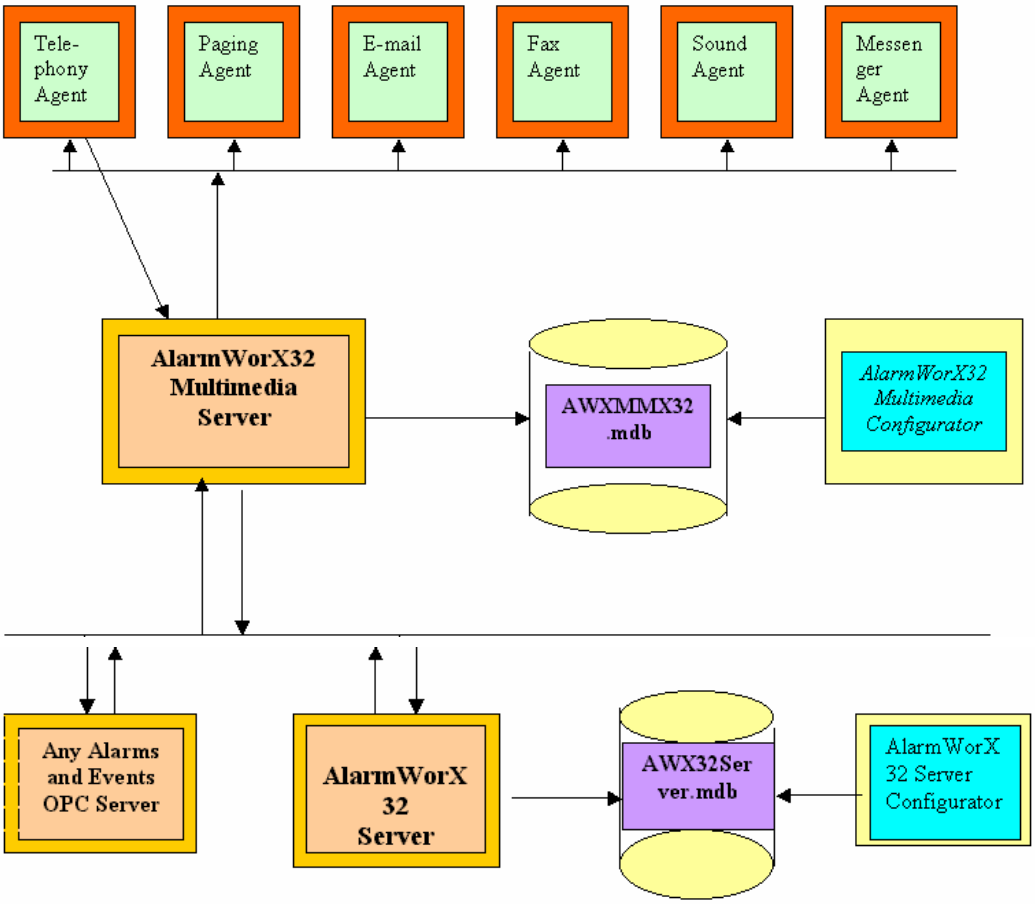
Step-by-Step Conversion Procedure

The figure below provides you with a general view of SMAR AlarmWorX+ to AlarmWorX Conversion Utility (hereafter called "Converter"). The Converter's two main parts are shown below. The first part has been designed to point to place where AlarmWorX+ information is stored. The second part is for configuring the multimedia information extraction process.



Conversion Process Diagram

AlarmWorX32 Multimedia Services Architecture



AlarmWorX Multimedia Architecture

Step 1: A General Description of the Converter

Step 2: Configuration Fields

Step 3: Importing Into the AlarmWorX Server Configurator

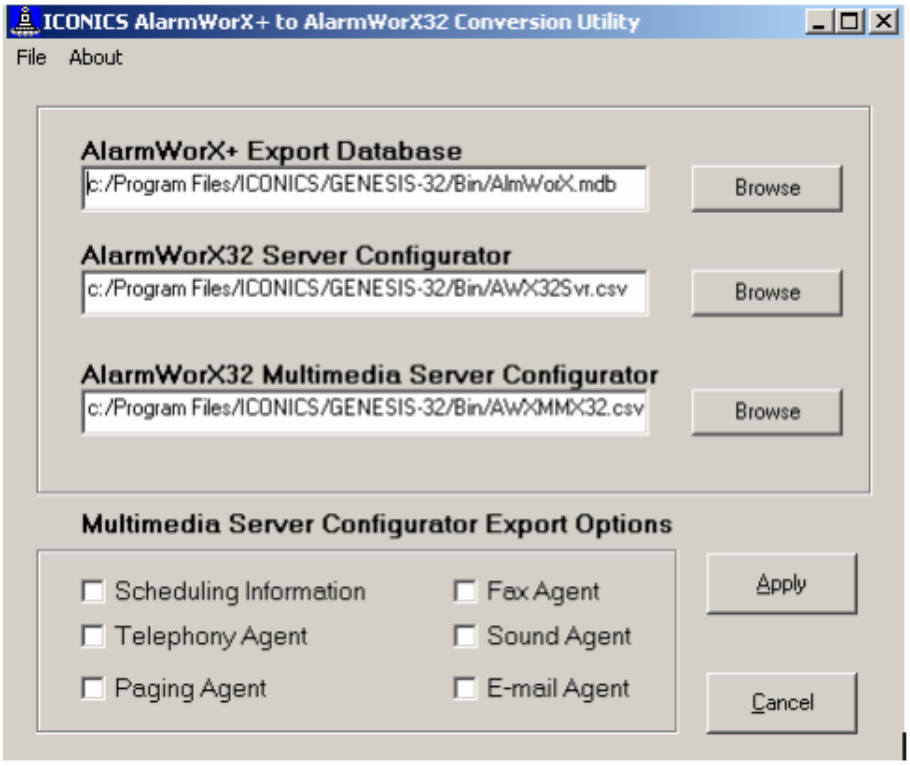
Step 4: Importing .csv Files Into the AlarmWorX Multimedia Server Configurator

Step 1: A General Description of the Converter

You can extract one or more categories from the following list (in case of AlarmWorX+ Multimedia notification information):

1. Scheduling information
2. Telephony agent information
3. Paging agent information
4. Fax agent information
5. Sound agent information
6. E-mail agent information

To perform an extraction of AlarmWorX+ Tags and Multimedia Notification data to .csv files, you must select the Almworx.mdb file, then point the Converter to the places where you wish to store the extracted .csv files (for the AlarmWorX Server Configurator and AlarmWorX Multimedia Server Configurator, respectively).



General View of Converter

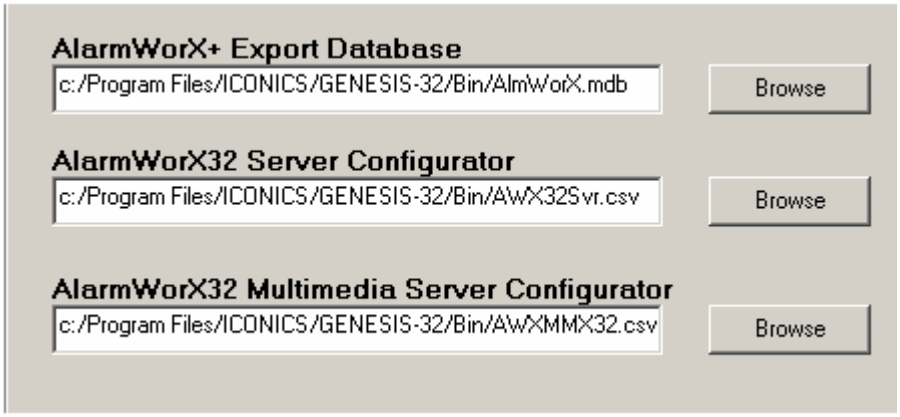
Step 2: Configuration Fields

AlarmWorX+ Export Database: The location of the AlarmWorX+ Configuration .mdb file.

AlarmWorX Server Configurator: The destination of the .csv file for AlarmWorX Server Configurator.

AlarmWorX Multimedia Server Configurator: The destination of the .csv file for the AlarmWorX Multimedia Server Configurator.

The **Export Database, Server Configurator,** and **Multimedia Server Configurator** fields on the **AlarmWorX+ Conversion Utility** dialog box make it easy for you to select the source and destination of database files.



Configuring the Destination of Extracted Files

Multimedia Server Configurator Export Options

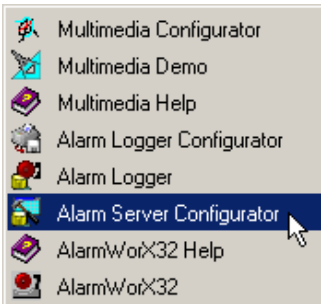
- **Scheduling Information:** Check this option to export AlarmWorX+ scheduling information.
- **Telephony Agent:** Check this option to export the AlarmWorX+ Telephony configuration.
- **Paging Agent:** Check this option to export the AlarmWorX+ Paging configuration.
- **Fax Agent:** Check this option to export the AlarmWorX+ Faxing configuration.
- **Sound Agent:** Check this option to export the AlarmWorX+ sound file configuration.
- **E-mail Agent**: The E-mail Agent allows you to send an e-mail giving alarm information.

The **Multimedia Server Configurator Export Options** section of the **AlarmWorX+ Conversion Utility** dialog box appears below:

Multimedia Server Configurator Export Options

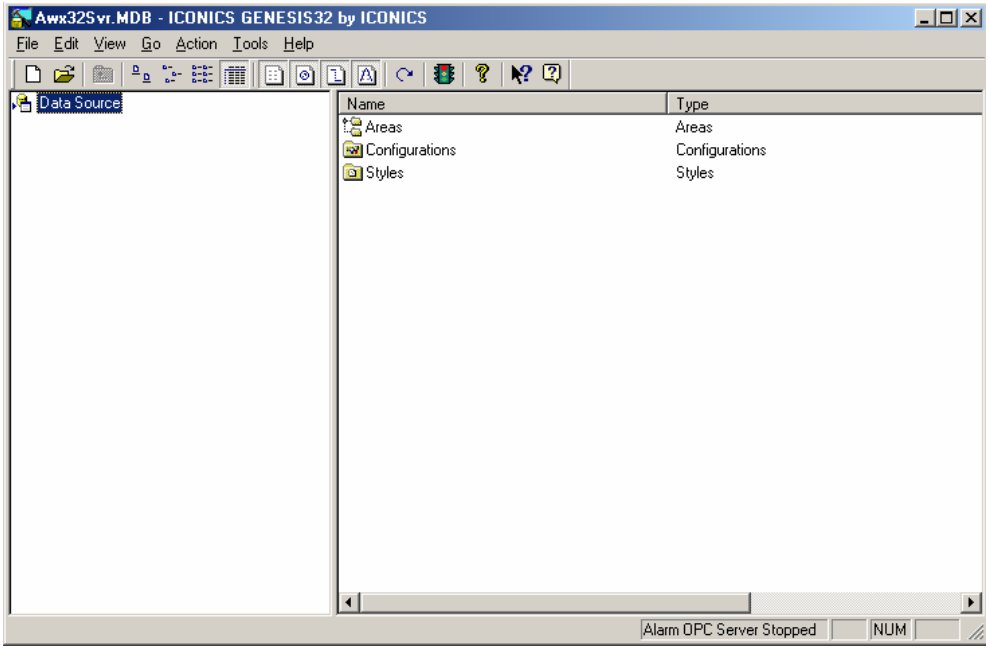
Step 3: Importing Into the AlarmWorX Server Configurator

To open the AlarmWorX Server Configurator, follow the path Start > Programs > Smar ProcessView > AlarmWorX > Alarm Server Configurator, **as shown below:**



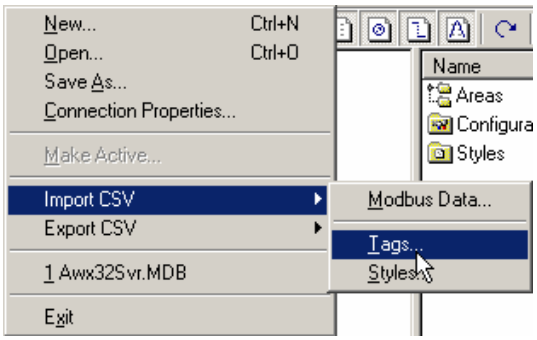
Opening the Alarm Server Configurator

The AlarmWorX Server Configurator screen will open, as shown below:



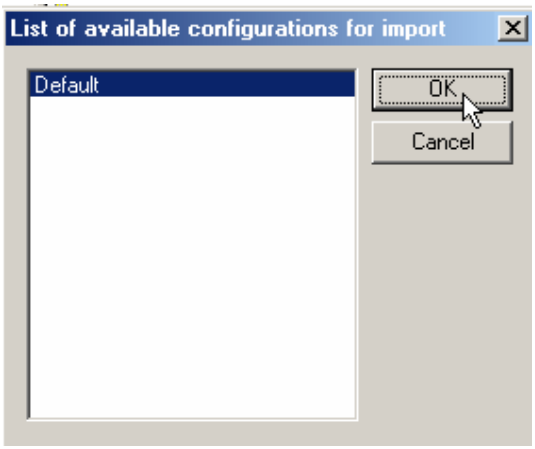
AlarmWorX Server Configurator Screen

To import specially created .csv files into the AlarmWorX Server Configurator, go to **File/ Import CSV / Tags** and choose the correct file, as shown below:



Choosing the File

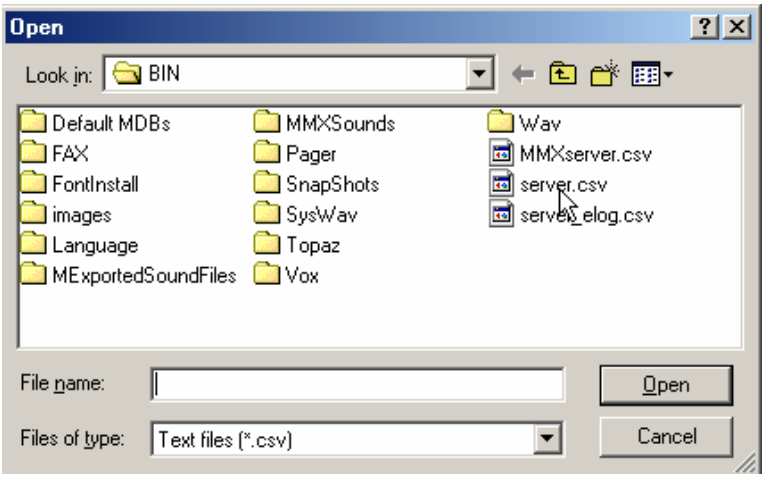
The **List of Available Configurations for Import** dialog box will appear, as shown below:



List of Available Configurations for Import Dialog Box

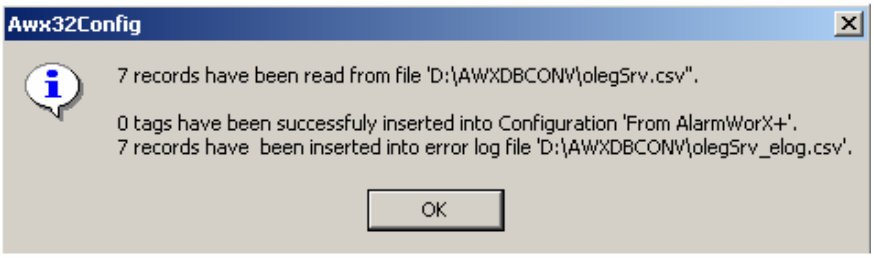
Click on the **OK** button.

The **Open** dialog box will appear, as shown below:



Selecting Your Server .csv File

In the directory, click on the file that you wish to import, as shown in the figure above. The AlarmWorX Server Configurator will then try automatically to read and incorporate data from the designated .csv file. Immediately after the import process has been completed, the AlarmWorX Server Configurator will display a notification message box with statistical info about the inserted tags, as shown in the figure below:



Tags Successful Import Notification Message Box

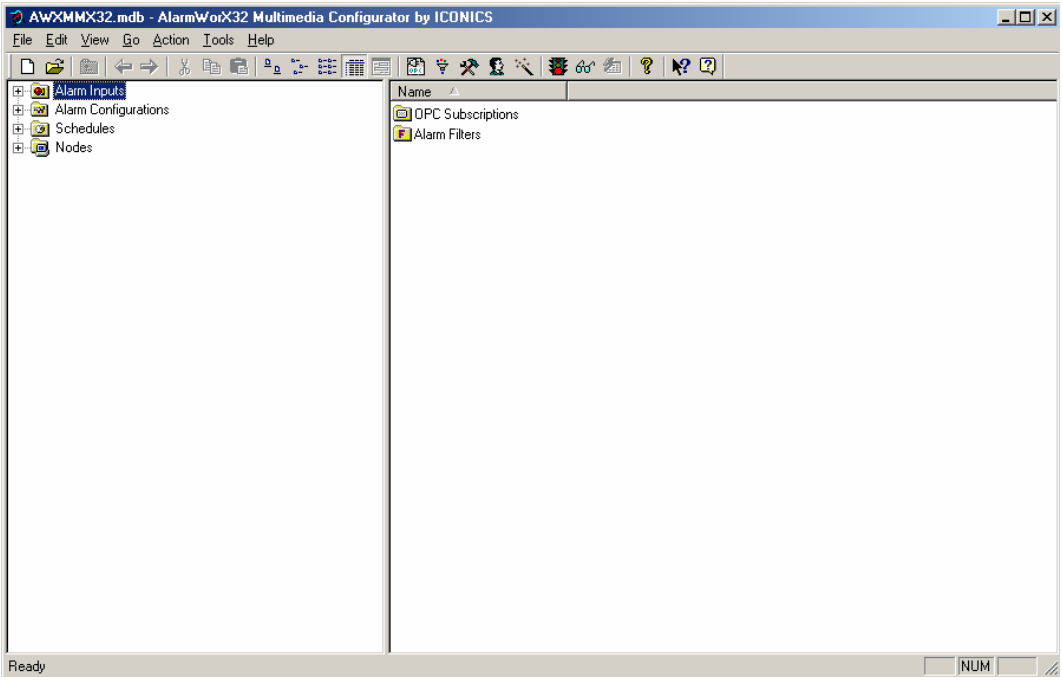
Configurator

Step 4: Importing .csv Files Into the AlarmWorX Multimedia Server

To open the AlarmWorX Server Configurator, follow the path **Start > Programs > Smar ProcessView > AlarmWorX > Multimedia Configurator,** as shown below:

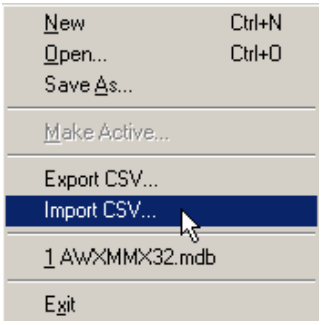
Opening Multimedia Configurator

The AlarmWorX Multimedia Configurator screen will open, as shown below:



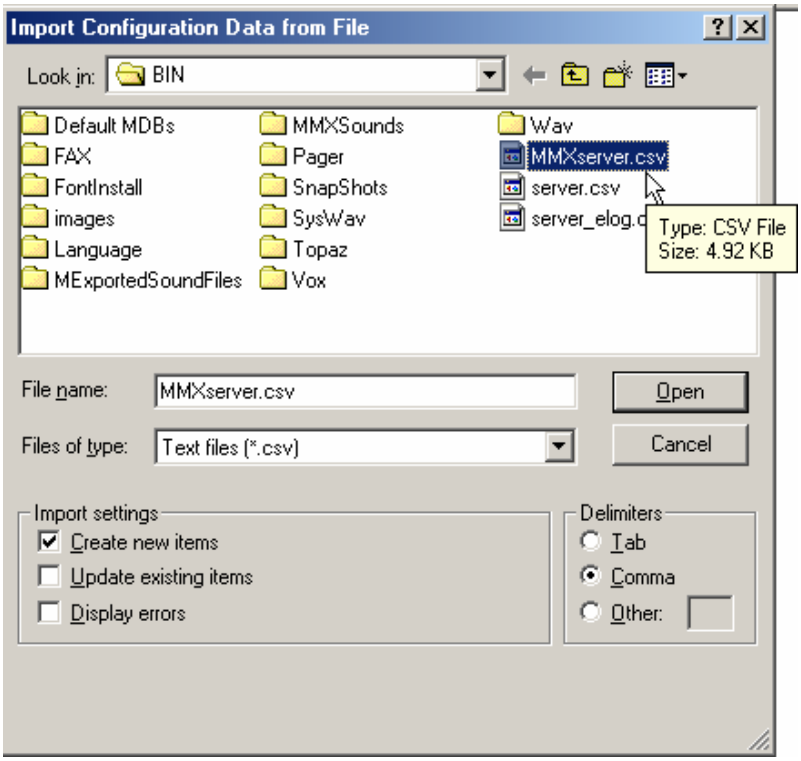
AlarmWorX Multimedia Configurator Dialog Box

To import specially created .csv files into the AlarmWorX Multimedia Server Configurator, go to select **Import CSV** from the **File** menu and choose the right file as shown below:



Accessing the .csv Files

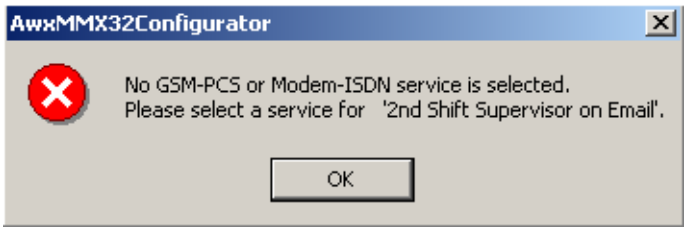
.



Importing Configuration Data From File

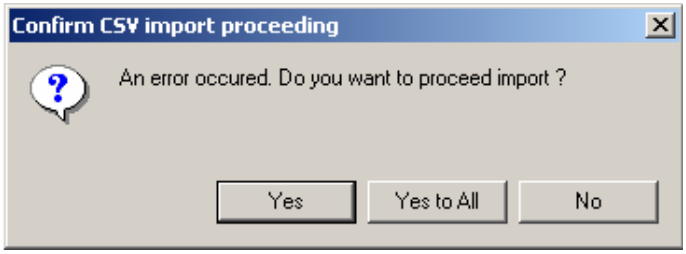
In the directory, click on the file that you wish to import, as shown in the figure above.

During the import process, an error can occur. In the figure below, the error message box represents a particular pager type of record error.



Error Message Related to Paging Service

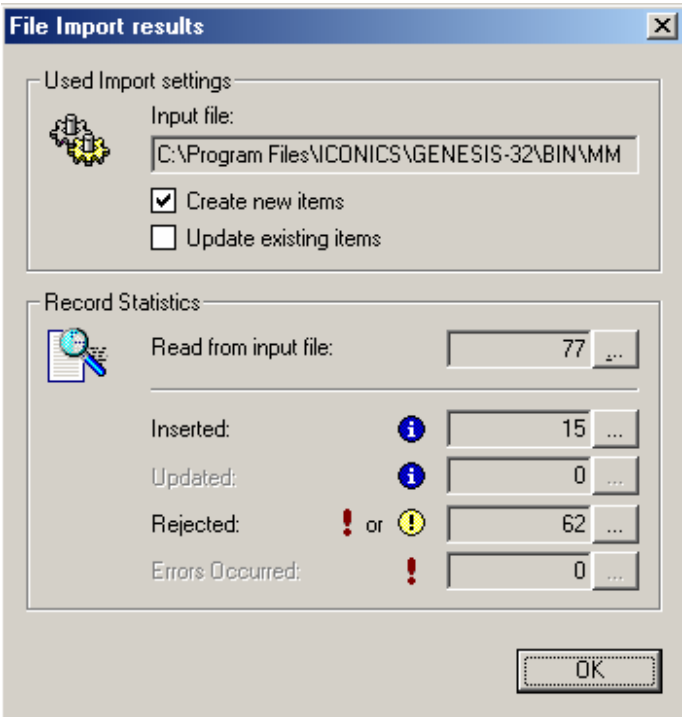
After clicking on the **OK** button on the error message box, a **Confirm CSV Import Proceeding** confirmation message box will appear, as shown below:



Confirm CSV Import Proceeding Message Box

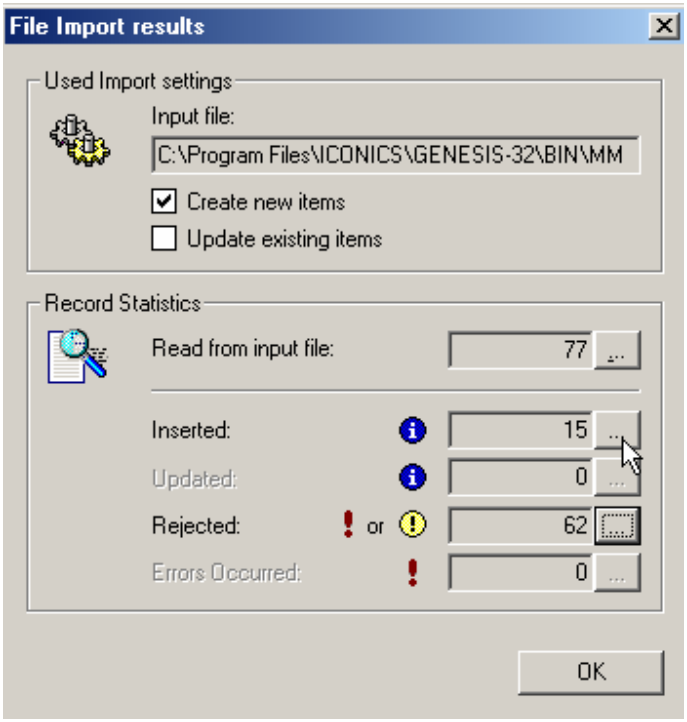
This message box can even be used to stop the import process.

The **File Import Results** dialog box will appear, as shown below:



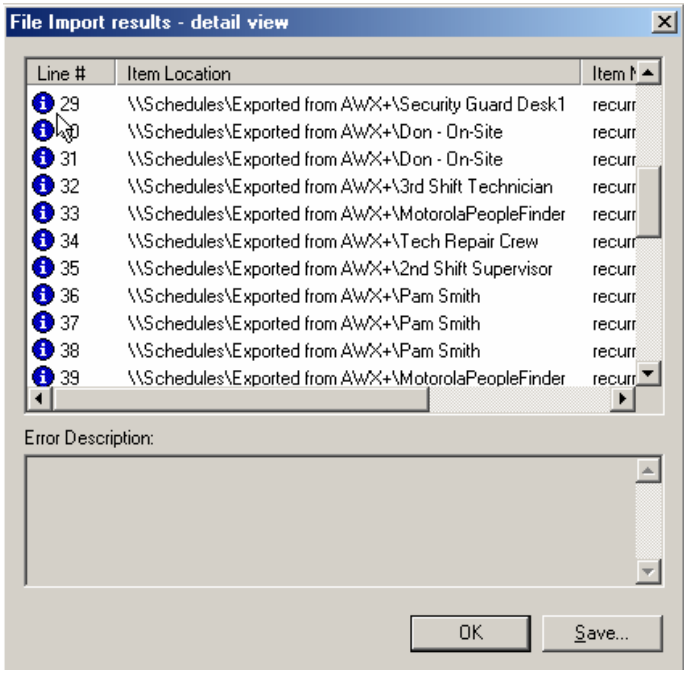
File Import Results Dialog Box

In the figure above, the **File Import Results** dialog box of the AlarmWorX Multimedia Server Configurator displays statistical data about the import process. To see details of files that you have successfully imported, click on the **...** button, as shown below:



Ellipse Button for Successfully Imported Files

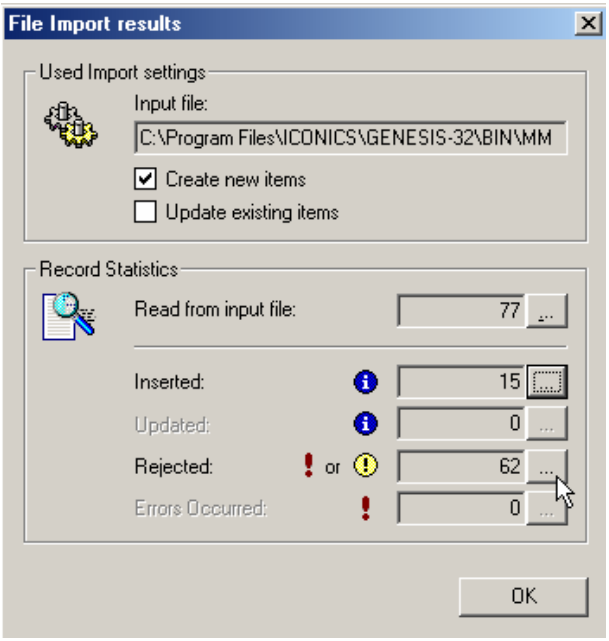
The **Detail View** dialog box will appear, as shown below:



Details of Successfully Imported Tools

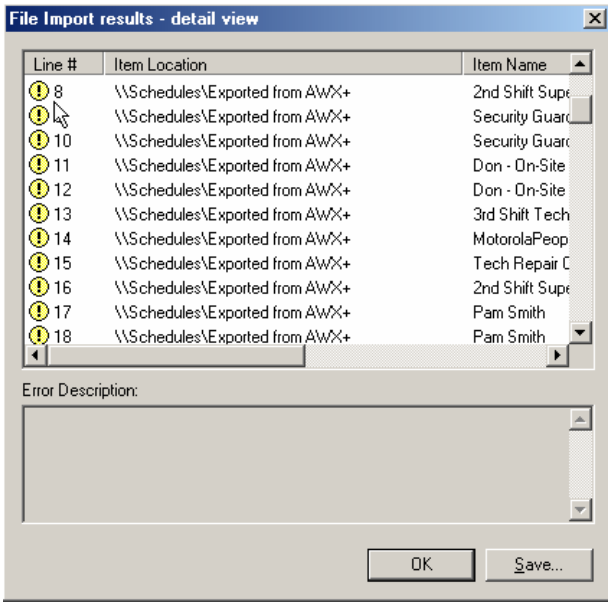
The successfully imported files are listed, as shown in the figure, above. Click on the **OK** button to return to the **File Import Results** dialog box.

To view details of the files that were not successfully imported, click on the **...** button, as shown below:



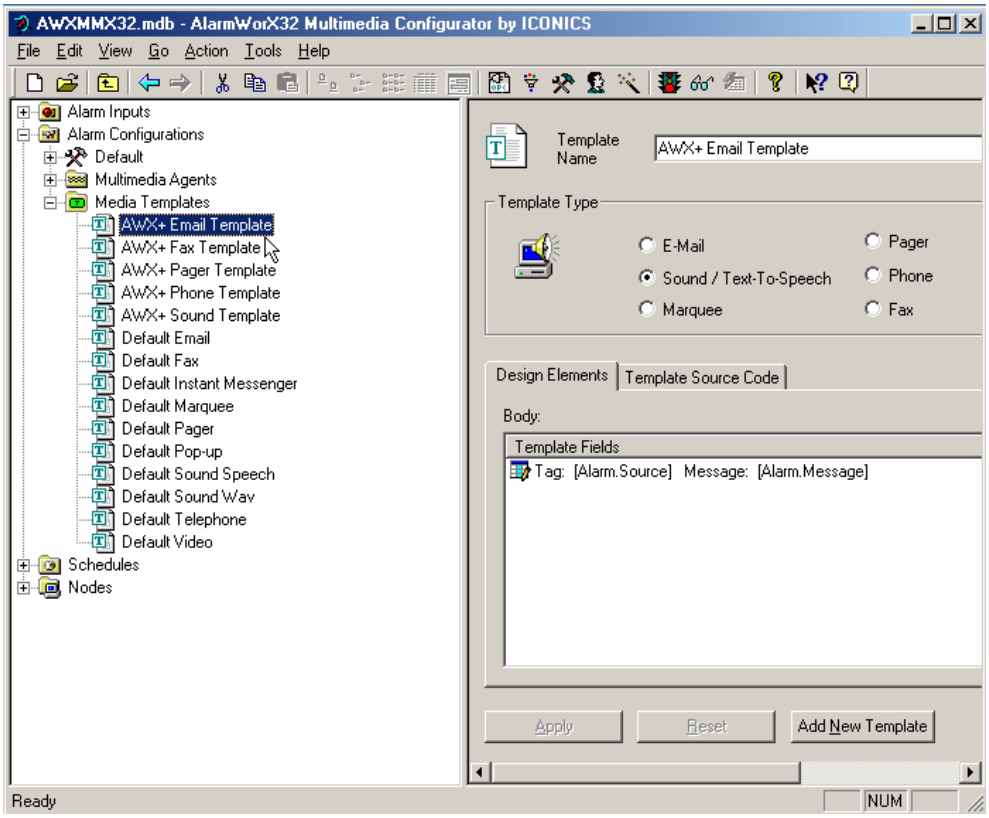
Ellipse Button for Rejected Files

The **Detail View** dialog box will appear, as shown below:



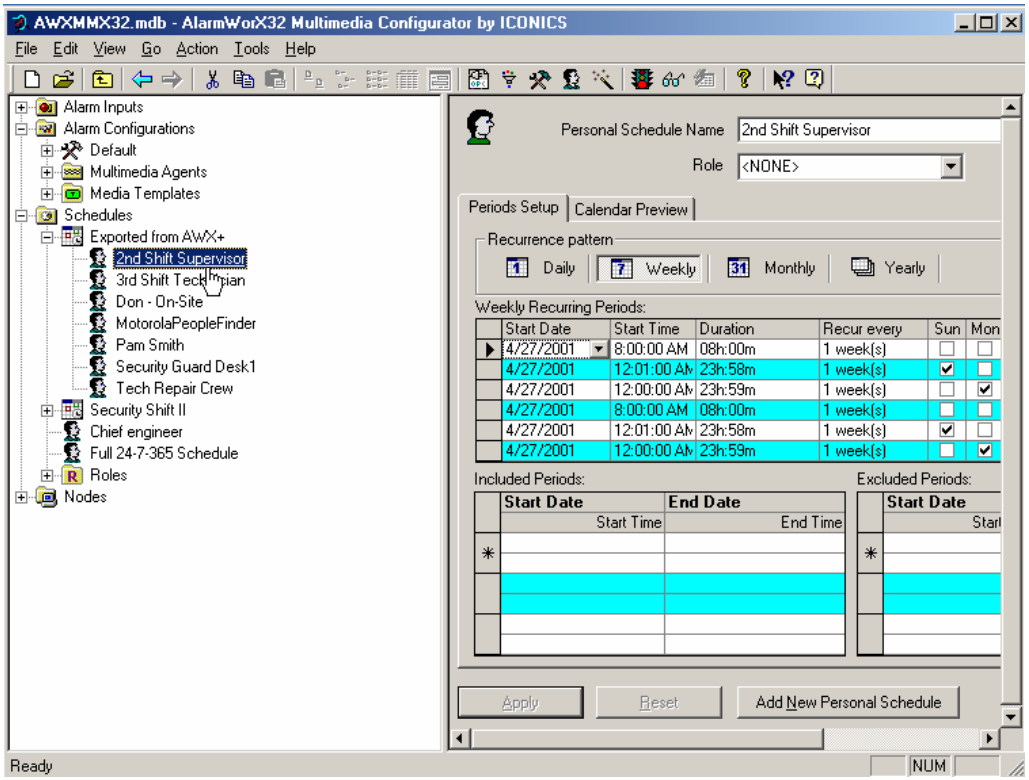
Detail View of Files Not Successfully Imported

The files not successfully imported are listed, as shown in the figure above. Click on the **OK** button to return to the **File Import Results** dialog box. Click on the **OK** button to return to the **Multimedia Configurator** screen, as shown below:



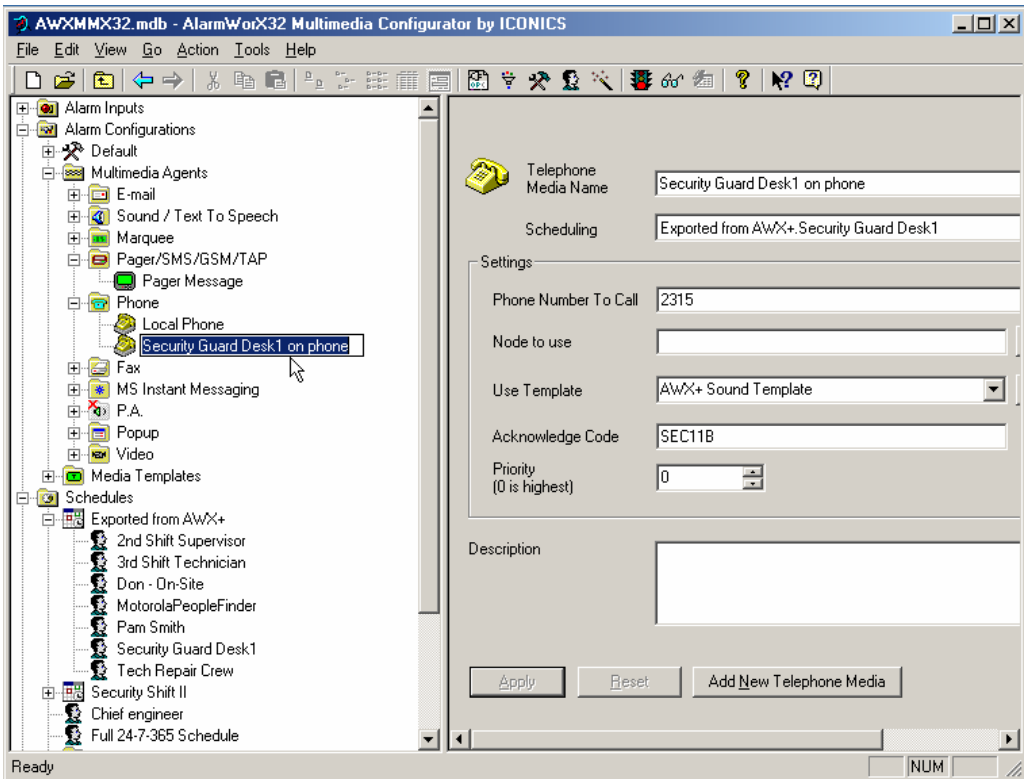
Multimedia Configurator Dialog Box: Template View

As shown in the figure above, click on **Alarm Configurations,** then **Media Templates,** and a list of templates will pop down. Click on one of the templates; it will appear in the right pane.



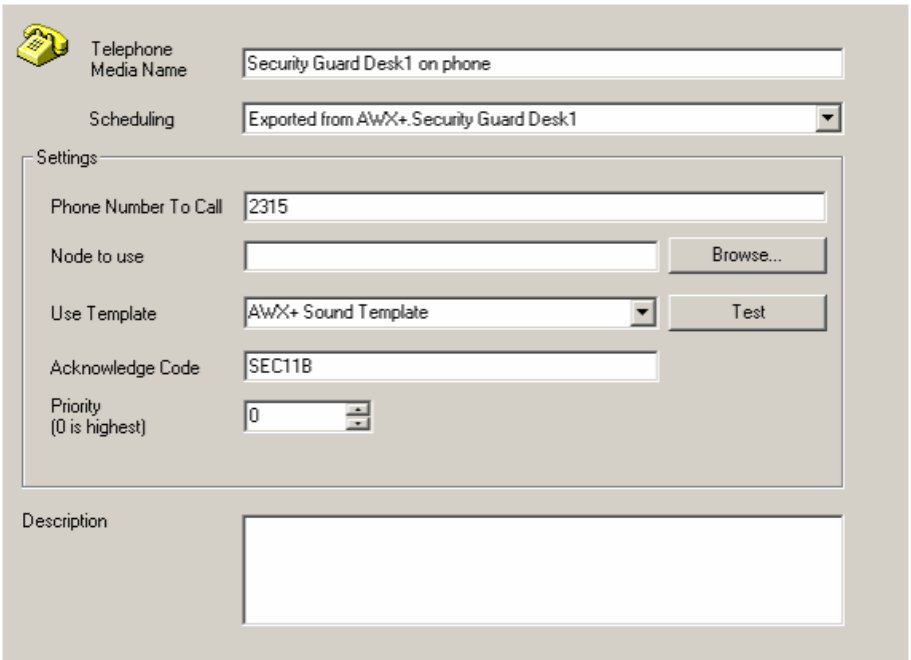
Multimedia Configurator Dialog Box: Schedule View

As shown in the figure above, click on **Schedules,** then **Exported from AWX+,** then on, for example, **2nd Shift Supervisor.** The supervisor's schedule will appear in the right pane.



Multimedia Configurator Screen: Telephone Media Name View

In the figure above, click on **Alarm Configurations, Multimedia Agents, Phone,** and **Security Guard Desk 1 on phone.** The imported telephone agent configuration appears in the right pane.



Detailed View of Telephone Media Name Record

Chapter1

Introduction

1.1 Introduction to AlarmWorX Multimedia

Welcome to Smar AlarmWorX Multimedia, a new generation of modular automation for advanced OPC-based HMI and Visualization by Smar. The AlarmWorX Multimedia Configurator is a standalone product that allows you to configure alarms using several different media to notify anyone, anywhere, of an occurring alarm.

AlarmWorX Multimedia is an option of AlarmWorX that provides OPC-compliant multimedia technology for remote alarm notification. Various multimedia "agents" are provided, including:

- Paging (including SMS/TAP support)
- Two-way paging
- Phone with call-in and call-out support
- E-mail
- Fax
- Voice annunciation of alarms via text-to-speech
- Voice annunciation of alarms via recorded .wav files
- Video
- Pop-up windows
- Computer screen marquee
- Instant messaging
- PA

For examples of multimedia alarming agents, open the "MMXDemo.gdf" file in the "Smar/ProcessView/Examples/Multimedia Demo" directory. You must have SMAR GraphWorX™ installed to run this demonstration.

1.1.1 AlarmWorX Multimedia Overview

Figure 1.1 provides an overview of how AlarmWorX Multimedia enables you to send and receive alarms using various multimedia agents. The Smar AlarmWorX Multimedia Configurator is a database with a user interface that allows you to configure alarms, alarm action sets, multimedia agents, and alarm acknowledgement codes. You can also use the Multimedia Configurator to create subscriptions to OPC Alarm and Event (AE) servers. In addition, you can configure schedules and destinations for alarm notification messages.

When your database configuration is completed and you start the Multimedia Server, the following occurs:

1. When the Multimedia Server enters runtime mode, it reads all the alarm configurations in the multimedia configuration database.
2. The Multimedia Server then subscribes to OPC AE servers based on the subscriptions that you created in the configuration database.

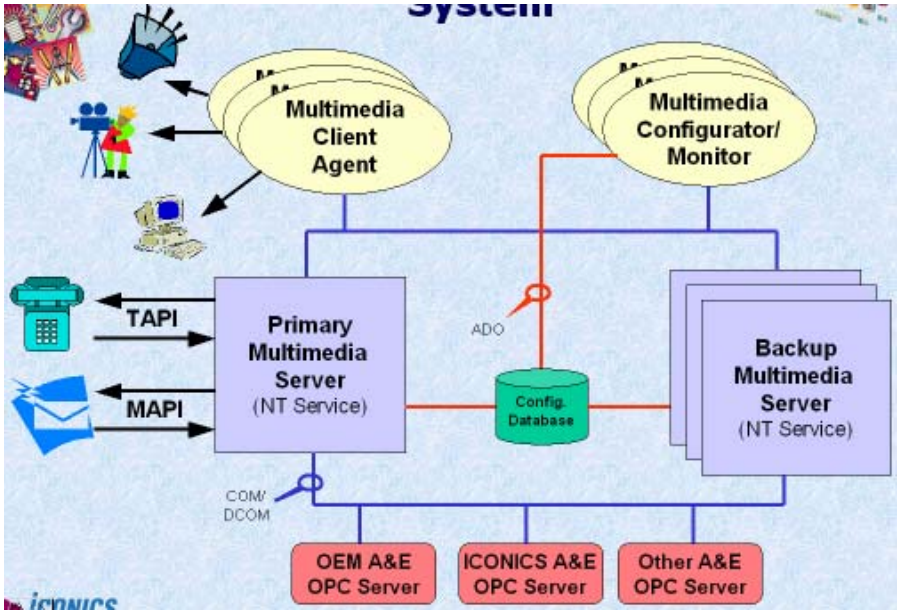


Figure 1.1. Overview of AlarmWorX Multimedia

3. In turn, the OPC AE servers generate alarms back to the Multimedia Server.
4. When the Multimedia Server receives alarms, it responds to those alarms according to the settings and alarm action sets that you configured in your database.
5. Based on these action sets, the notification messages are then sent to a recipient (an operator or a group) via the configured multimedia agent, such as a telephone call or a fax.
6. The recipient of the alarm message can then acknowledge the alarms using the configured multimedia device, such as a telephone or fax machine keypad.

Note: Redundant (backup) Multimedia Servers are currently not available.

1.2 Installing AlarmWorX Multimedia

This section describes the steps for installing Smar AlarmWorX Multimedia. Be sure to close any other applications before installing AlarmWorX Multimedia. For general guidelines and requirements for ProcessView installation, please refer to the Smar *Getting Started* user's guide.

1.2.1 System Requirements

To use this software, you must have the following *minimum* system requirements:

- 8X speed CD-ROM.
- 125 MB of disk space. (**Note:** This is the recommended amount of disk space for the Multimedia installation only. This does not include hardware drivers. Also, as the size of the databases increases over time, additional space may be needed.)
- VGA video card; 256 or more colors for best results.
- Sound card.
- Microsoft® Internet Explorer 5.5 or above.
- Microsoft Windows 98 SE, Windows 2000 with Service Pack 3, Windows Millennium (ME), or Windows XP with Service Pack 1, or Windows NT® 4.0 with Service Pack 6a.
- **Note:** Windows 98 SE is supported only by the non-Unicode version of ProcessView.
- Microsoft® SQL Server® 2000 or MSDE 2000 (with the latest service packs) or higher. To download and install the latest service packs, go to www.microsoft.com.

IMPORTANT NOTE: You must have a telephony card installed on the computer on which you are running the Telephony Agents (both Call-in and Call-out) and the PA Agent. AlarmWorX Multimedia supports Intel® Dialogic® boards. **Dialogic boards do not work for Windows 98, so neither the Call-in Agent nor the Call-out Agent will work on Windows 98.** You also need to have an analog phone line connected to the board. (**Note:** Digital lines are not supported.) Only Dialogic boards are supported for the current version of AlarmWorX Multimedia. Please see **Appendix B** for information about installing and configuring Intel Dialogic boards. For more information about purchasing and installing Intel Dialogic boards, please visit the Intel Web site at www.intel.com/network/csp/products/index_vp.htm.

CPU and RAM

Minimum computer CPU and RAM requirements depend on the application and operating system, as shown below:

Application Size	Processor	RAM
Small Windows 98 SE/NT Client/ME, 2000, XP	 233 MHz 400 MHz	 64 MB 128 MB
Medium Windows 98 SE/NT/ME, 2000, XP	 400 MHz 650 MHz	 128 MB 256 MB
Large All Operating Systems	 1.8 GHz	 512 MB - 1GB

The actual amount of RAM and/or processor speed will vary depending upon the I/O counts, networking, logging and alarming requirements, etc. To determine which type of computer best fits your application, set up a test application station.

Note: The processor and memory requirements of your existing project may be greater in this version of ProcessView than in previous versions due to additional and enhanced features in the product.

1.2.2 Installation Procedure

To install Smar AlarmWorX Multimedia use the following procedure:

Note: If your operating system (e.g., Windows NT) requires a login name, you must log in with administrator capability before installing the software.

1. Before installing Smar software be sure that all other applications, such as Microsoft Office or any antivirus software, are closed and/or disabled.
2. Insert the ProcessView product CD into your CD-ROM drive. If "Autorun" is enabled on your system, the CD introduction starts automatically. Otherwise, browse to your CD-ROM drive and run the "RunMe.bat" file.
3. You will see the CD introduction and the main menu. From here you can click on a link to the Smar Web site, go to the Documentation Center, view CD-based Web pages containing miscellaneous Information, and install software.
4. Click **Multimedia** on the software installation menu. The **Setup** screen briefly appears, followed by the **Welcome Message** screen, as shown in **Figure 1.2.** Click the **Next** button to continue.

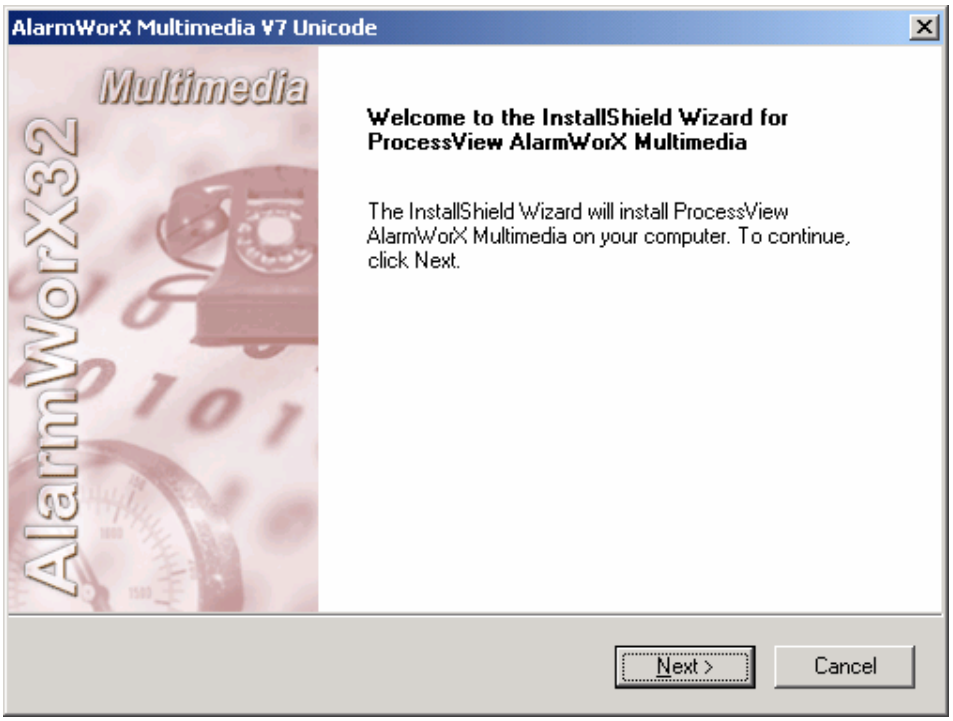


Figure 1.2. Welcome Screen

5. The Multimedia installation wizard will then check to see if Microsoft Data Access Components (MDAC) is installed on your system. If MDAC is installed, the setup will proceed to the next step. If it is not installed, you will be prompted to install MDAC. If the system prompts you to install MDAC, follow the instructions on the subsequent dialog boxes.

6. The **Software License Agreement** dialog box appears, as shown in **Figure 1.3.** Read the License Agreement. Click **Yes** if you accept the terms of the agreement.

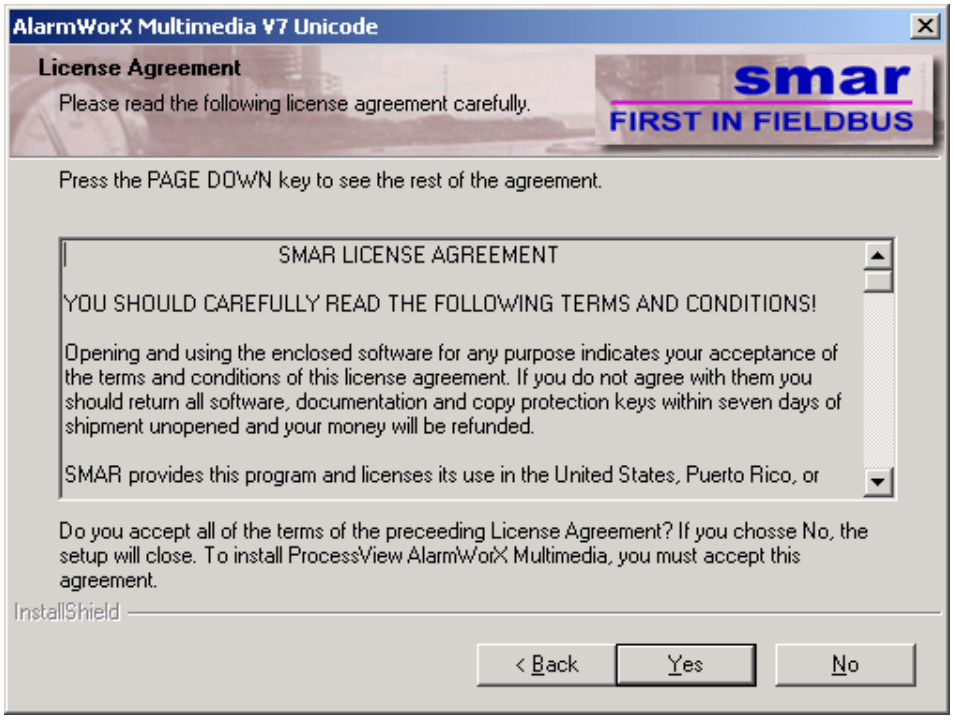


Figure 1.3. Smar License Agreement

7. The **User Information** dialog box appears, as shown in **Figure 1.4.** Type your (the user's) name in the **Name** field; your company's name in the **Company** field; and your product serial number in the **Serial** field. Click the **Next** button to continue.

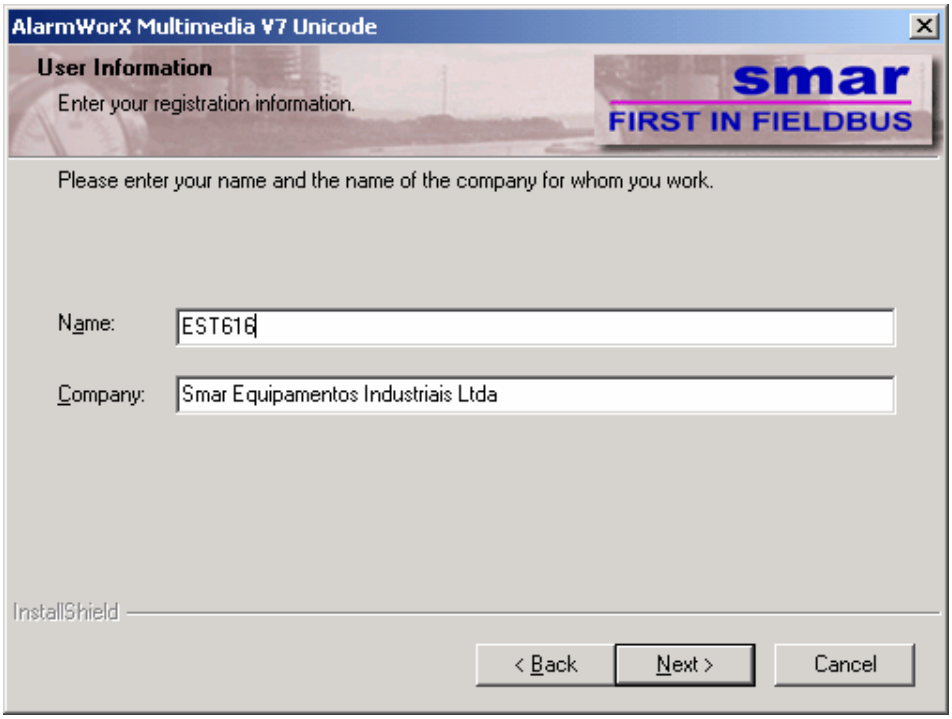


Figure 1.4. User Information Dialog Box

8. The **Choose Installation Destination** dialog box appears, as shown in **Figure 1.5.** The default location is "C:\Program Files\Smar\ProcessView." If you wish to specify a different directory for installation, click the **Browse** button and choose the appropriate installation folder. After you have chosen a location, click the **Next** button to continue the installation.

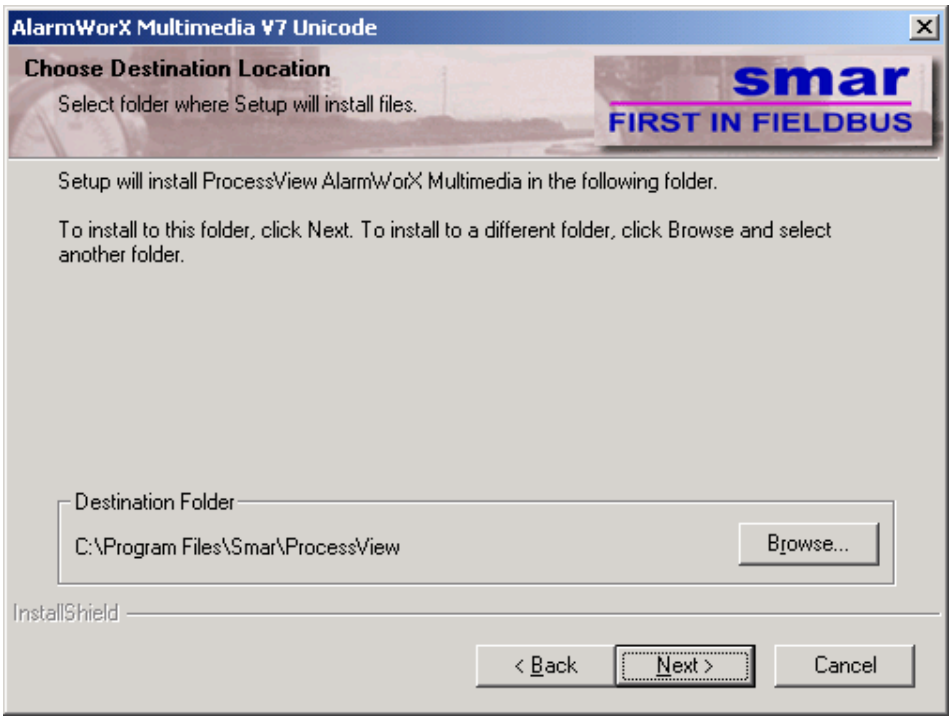


Figure 1.5. Choosing Your Installation Location

9. The **Select Components** dialog box appears, as shown in **Figure 1.6.** As you can see, AlarmWorX Multimedia contains many multimedia "agents" for alarm notification, such as video, paging, and e-mail. Here you can customize your installation by selecting which agents to install. This is helpful if you have limited space on your hard drive or if you do not expect to use one or more multimedia agents. Click on the appropriate boxes to select the agents that you wish to install. The space required on your installation directory (as well as the space available on the directory) is displayed at the bottom of the dialog box. Once you have made your selections, click the **Next** button to continue.

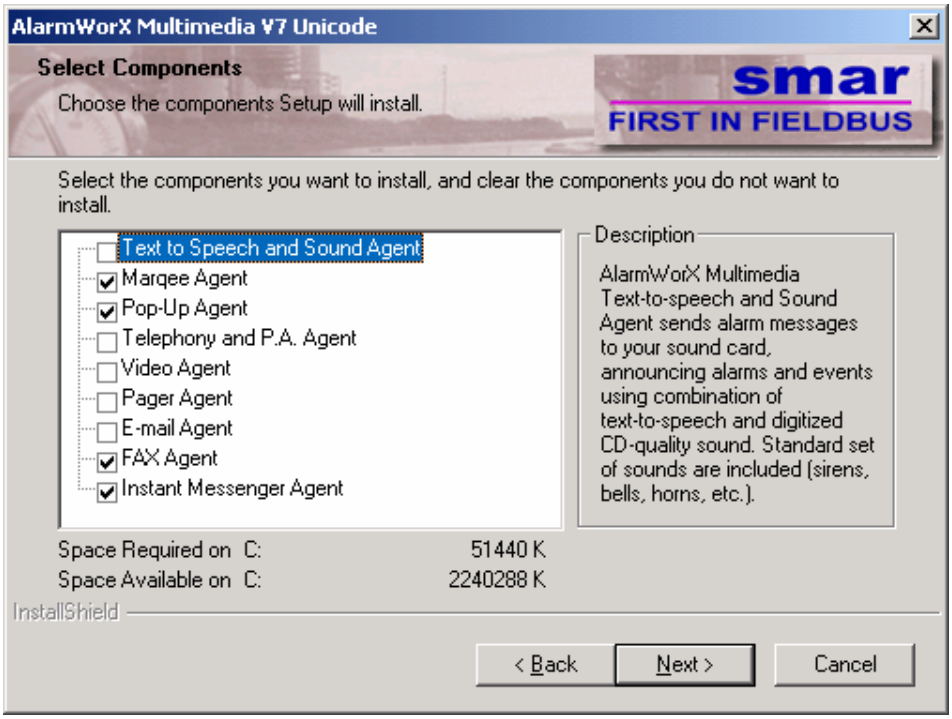


Figure 1.6 Select Components Dialog Box

10. The **Microsoft Agent License Agreement** appears, as shown in **Figure 1.7.** Read the agreement carefully. If you agree with the terms and conditions, click the **Yes** button to continue.

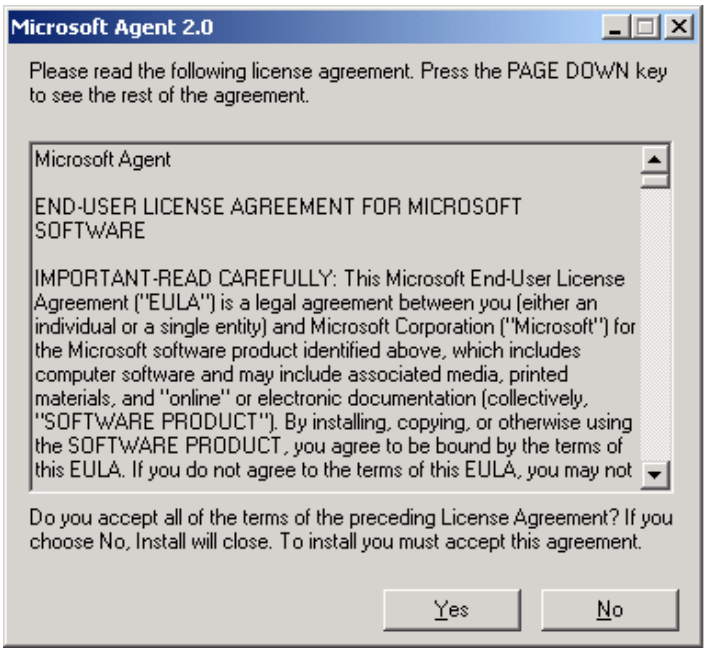


Figure 1.7. Microsoft Agent License Agreement

11. The **Microsoft Text-to-Speech Engine License Agreement** appears (if you chose to install the Text-to-Speech agent), as shown in **Figure 1.8.** Read the agreement carefully. If you agree with the terms and conditions, click the **Yes** button to continue.

Figure 1.8. Microsoft Text-to-Speech Engine License Agreement

12. The **Setup Status** window appears. While the system files are being automatically copied, the percentage of the files already copied appears in the window's progress bar, as shown in **Figure 1.9.**

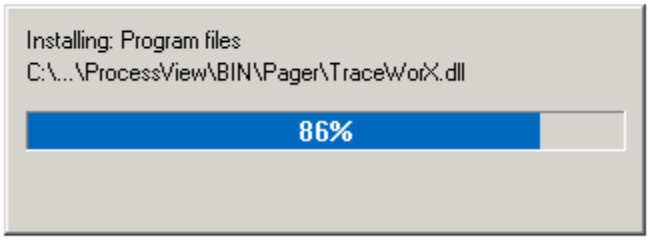


Figure 1.9. Setup Status Window

13. The **Fonts** window, shown in **Figure 1.10,** is open during the process of installation, but it will not stop the installation. The installation opens this window to configure Marquee Agent dotted fonts. You can ignore this window and close it at any time.

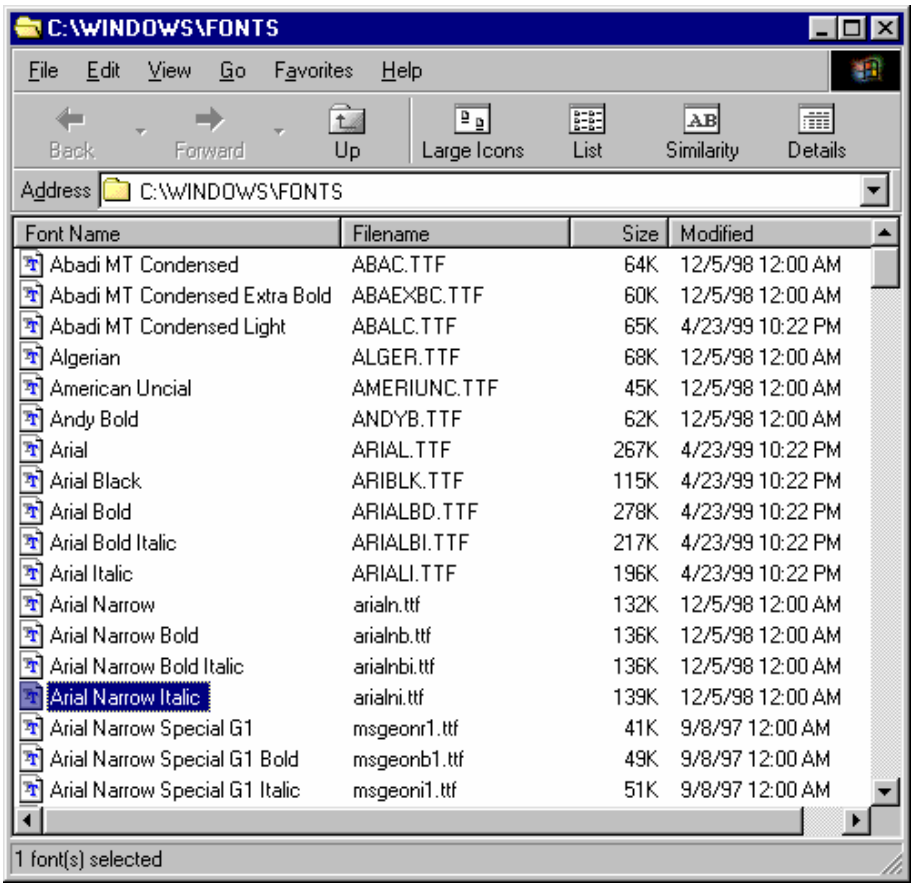


Figure 1.10. Fonts Window

14. The Multimedia installation includes a Pager Agent that connects to a wide variety of pager services and supports the most popular paging protocols:

- Tele Alphanumeric Protocol (TAP)
- Simple Messaging Service (SMS)

During the installation of Multimedia, after checking the box for including the Pager Agent, you can select which paging services to include with the installation. There are two separate lists: one for the **Modem/ISDN (TAP)** pagers, as shown in **Figure 1.11,** and one for **GSM/PCS (SMS)** pagers, as shown in **Figure 1.12.** It is recommended that you select all carriers in each list so that they will be available in the Multimedia configuration. Click **OK.**

Note: Please see **Appendix A** for information about SMS and TAP pager services configuration.

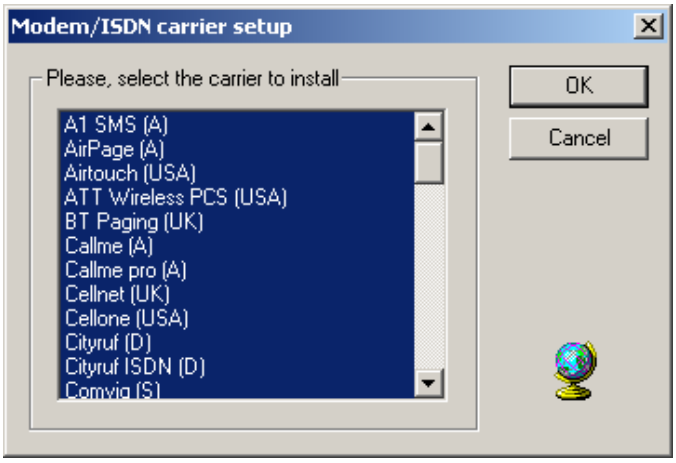


Figure 1.11. Modem/ISDN Carrier Setup

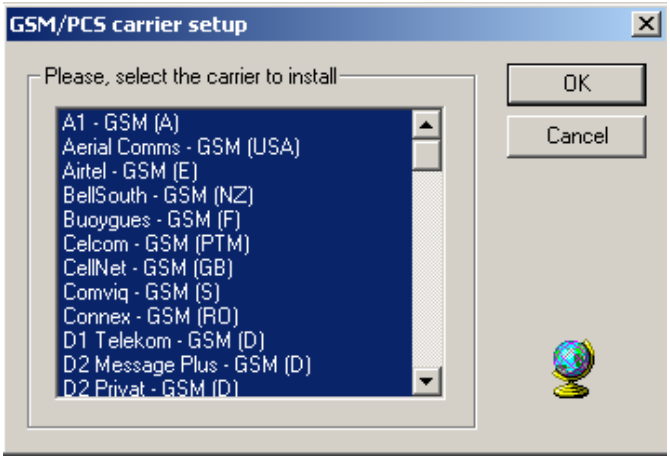


Figure 1.12. GSM/PCS Carrier Setup

15. The **Setup Complete** dialog box appears, as shown in **Figure 1.13.** Click the **Finish** button to complete the installation. When you have finished installing Multimedia, restart your computer.

Note: Depending on the multimedia agents you have chosen to install, you may encounter additional dialog boxes containing additional installation steps. Follow the instructions provided in these dialog boxes. For information about multimedia agent configuration, please see **Chapter 4.**

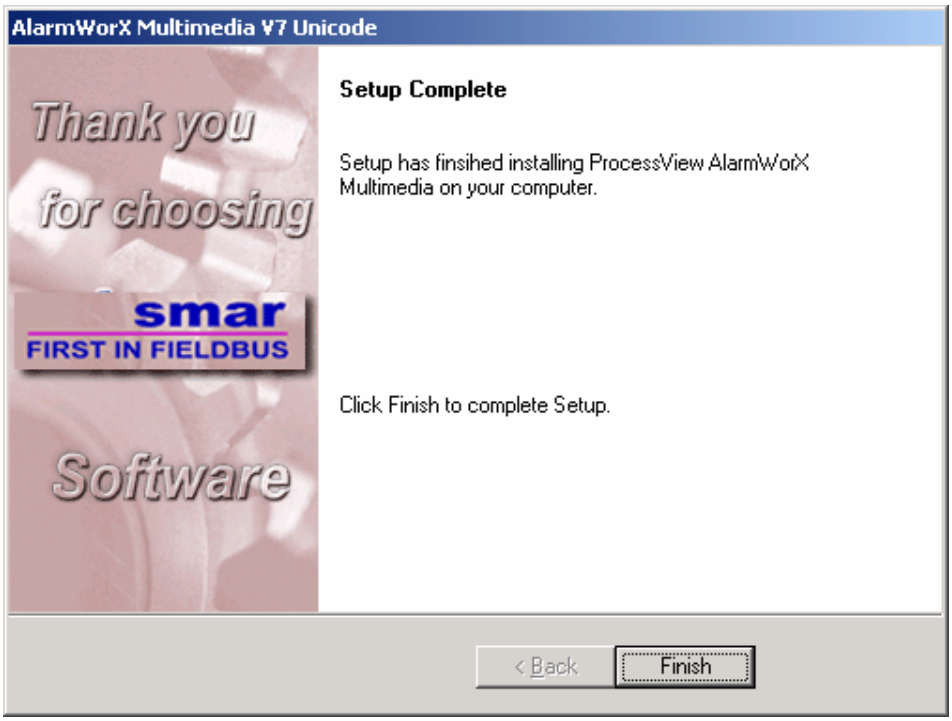


Figure 1.13. Setup Complete Dialog Box

1.3 Creating a New Configuration Database

The Multimedia Configurator is the user interface that allows you to configure alarms and multimedia agents for the Multimedia Server. Before you can configure your multimedia settings, you must first create a database in which your configuration can be stored:

IMPORTANT NOTE: You must have Microsoft SQL Server installed on your computer in order to create a new configuration database. Installation of Microsoft SQL Server Data Engine (MSDE) occurs during the AlarmWorX Multimedia installation. If you are using Microsoft Windows NT, Windows 2000, Windows XP, or .NET Server, you must log in with administrator capability in order to run the Configuration Database Wizard.

1. Launch the Multimedia Configurator from the Windows **Start** menu by selecting **Programs > Smar > ProcessView > AlarmWorX > Multimedia Configurator.** You can also run the Multimedia Demo from this menu.

2. The first time you open the Configurator, the **Configuration Database Wizard** helps you create a new configuration database, as shown in **Figure 1.14.** Click the **Next** button to continue.

Figure 1.14. Introduction to Multimedia Configuration Database Wizard

3. You have two options for creating your new database, as shown in **Figure 1.15.** You can either create a new Microsoft SQL Server database, or you can add the configuration database structure to an existing Microsoft SQL Server database. Here we will assume that you will choose the first option (to create a new database). Select **I want to create a new Microsoft SQL Server database on local node,** and then click the **Next** button to continue.

Note: For information about how you can add the configuration database structure to an existing Microsoft SQL Server database, see the "Adding the Multimedia Configuration to an Existing Database" section below.

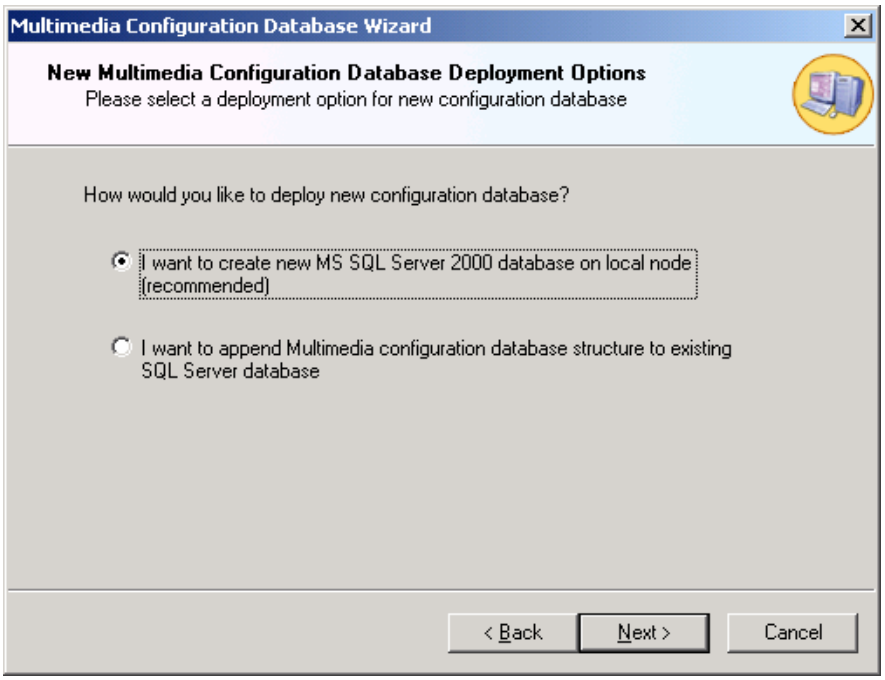


Figure 1.15. Creating a New Microsoft SQL Server Database

4. Choose the settings for the SQL Server database parameters, as shown in **Figure 1.16.** In the **SQL Server** field, select the local SQL Server on which to create a new database. Type a name for the database in the **Database Name** field. In the **Database Path** field, choose a directory path for the new database. You can browse for a directory by clicking the **...** button to the right of this field.

Note: Usually you have only one instance of SQL Server running on the local node (in this case the **SQL Server** field has only one option: "(local)". However, it is possible to run multiple SQL Server instances on the local node, in which case the **SQL Server** field lists all those SQL Server instances: "(local)" for the default instance and "node_name/instance_name" for all others. Again, all those are local SQL Servers.

Under the **Database Properties** section, specify an initial size for the database, which should be as large as possible. You can also specify a **Database Growth** option (in megabytes) or as a percentage of the total size. MSDE servers are capable of growing the database on the fly to store more data. However, if this operation is performed frequently, the overall system performance may decrease. Choosing an initially large database size and a corresponding database growth option can drastically improve system performance. To shrink the size of the new database, check the **Auto Shrink** check box.

Under the **Log File Properties** section, you can also modify the settings for the database transaction log file. Specify a **Log File Growth** option (in megabytes) or as a percentage of the total size. Again, a sufficient initial size setting can greatly improve performance. The default options should be adequate for most applications with a small to medium size load.

Click the **Next** button to create the new SQL Server database.

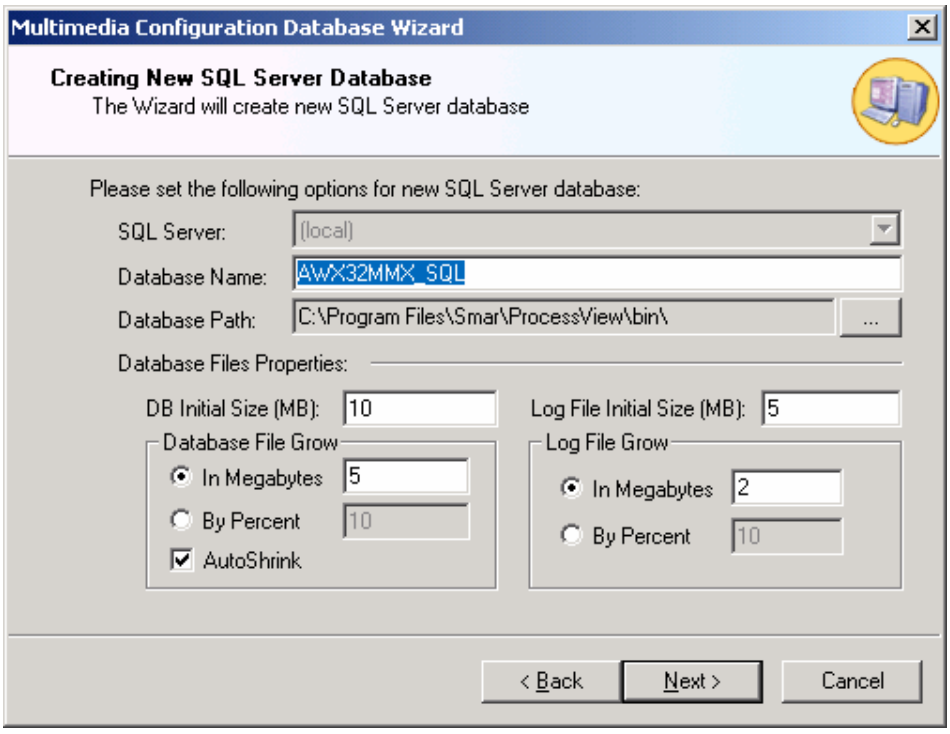


Figure 1.16 Specifying the Database Location and Properties

5. The Wizard creates the new SQL Server database, as shown in **Figure 1.17.** Click the **Next** button to continue, when it becomes available.

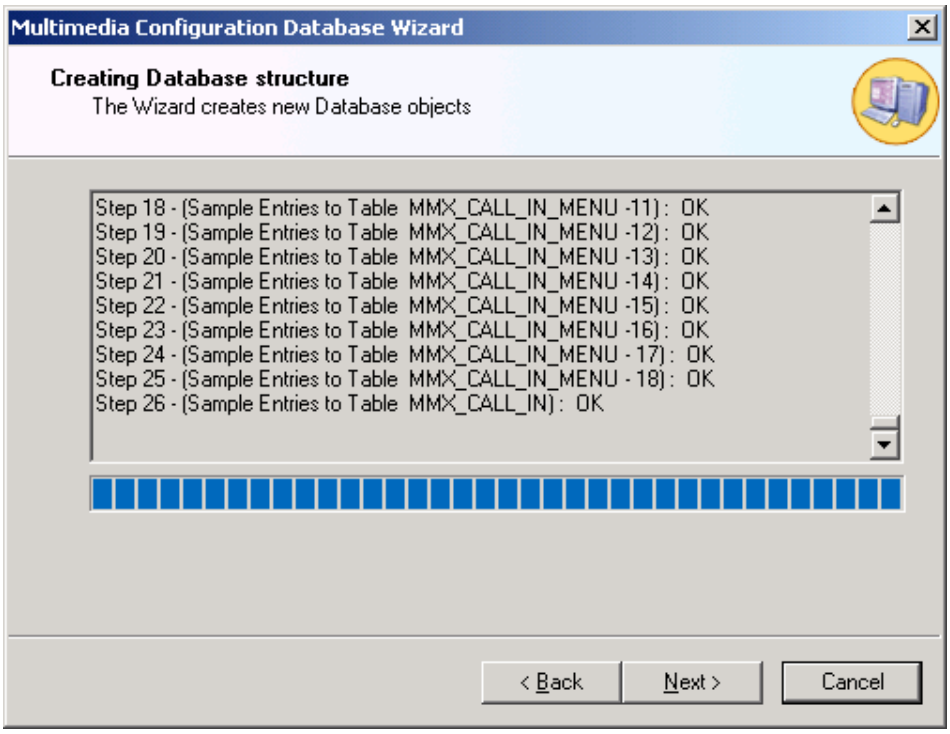


Figure 1.17. Creating Database Structure

6. The Configurator uses Universal Data Link (.udl) files to connect to the Microsoft SQL Server database. These .udl files contain OLE database connection information that allows the Configurator to create and manage connections to OLE databases. Enter a name and directory path for the new .udl file in the **Data Link File Name** field, as shown in **Figure 1.18.** You can browse for a directory by clicking the **...** button to the right of this field. Click the **Next** button to continue.

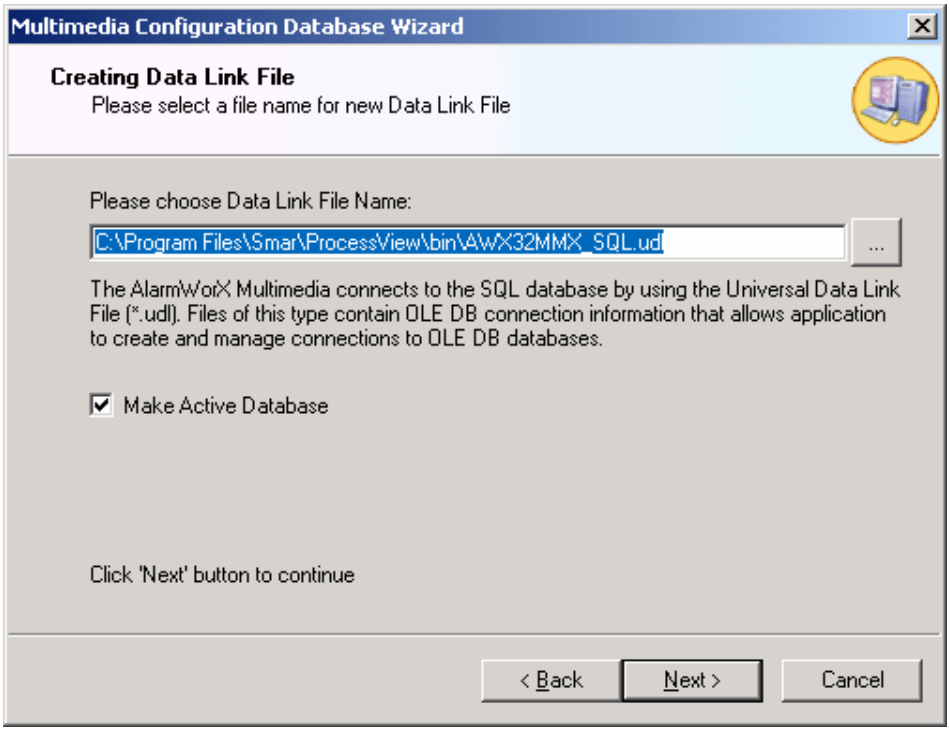


Figure 1.18. Creating a Universal Data Link File

7. Once the Universal Data Link has been created, a summary appears, as shown in **Figure 1.19.** the **Finish** button to complete the database creation.

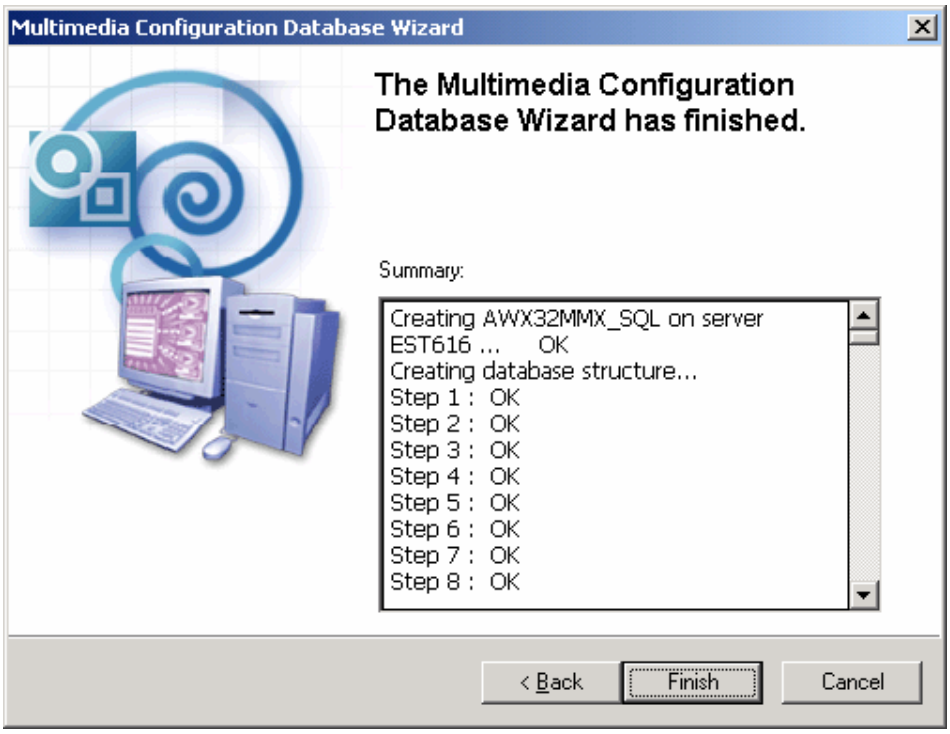


Figure 1.19. Database Creation Complete

1.4 Adding the Multimedia Configuration to an Existing Database

As mentioned above, the Configuration Database Wizard also gives you the option to add the Multimedia configuration database structure to an existing Microsoft SQL Server database.

1. If you decide to use this option, select **I want to append the Multimedia Configuration Database structure to existing SQL Server database**, as shown in **Figure 1.20.** Click the **Next** button to continue.

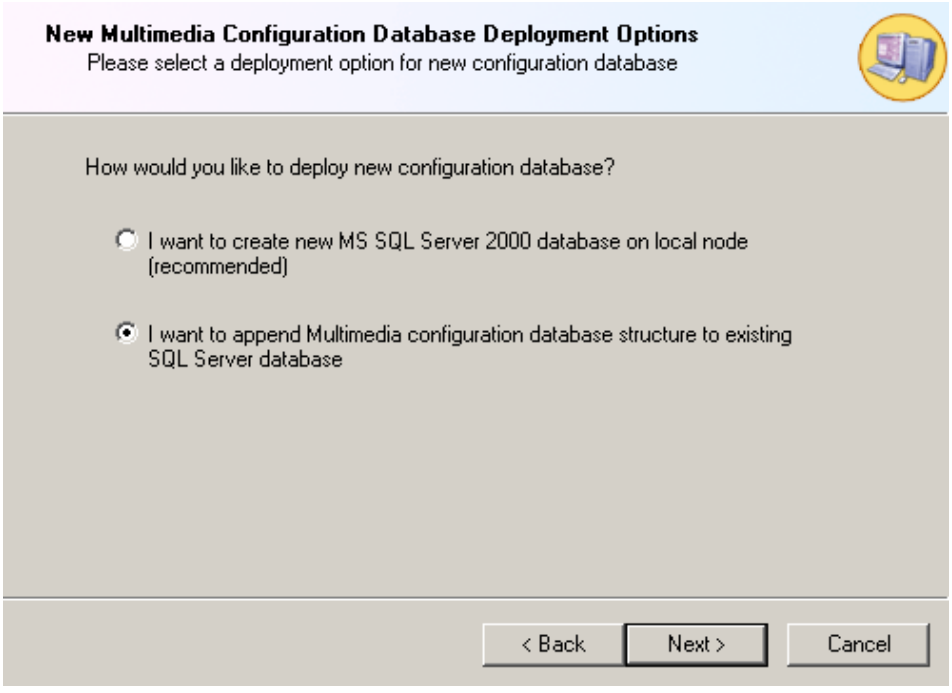


Figure 1.20. Adding the Configuration to an Existing Database

2. You are now prompted to connect to the existing SQL Server database. Click the **Log On SQL Server** button, as shown in **Figure 1.21.**

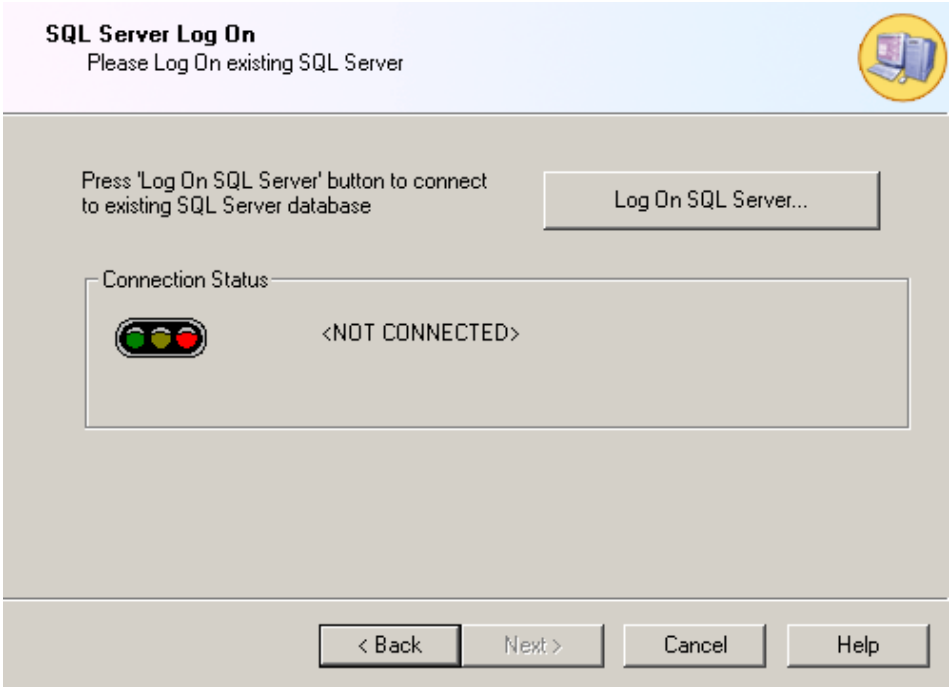


Figure 1.21. Connecting to an Existing SQL Server Database

3. You are now prompted to connect to the existing SQL Server database. Click the **Log On SQL Server** button, as shown in **Figure 1.22.**

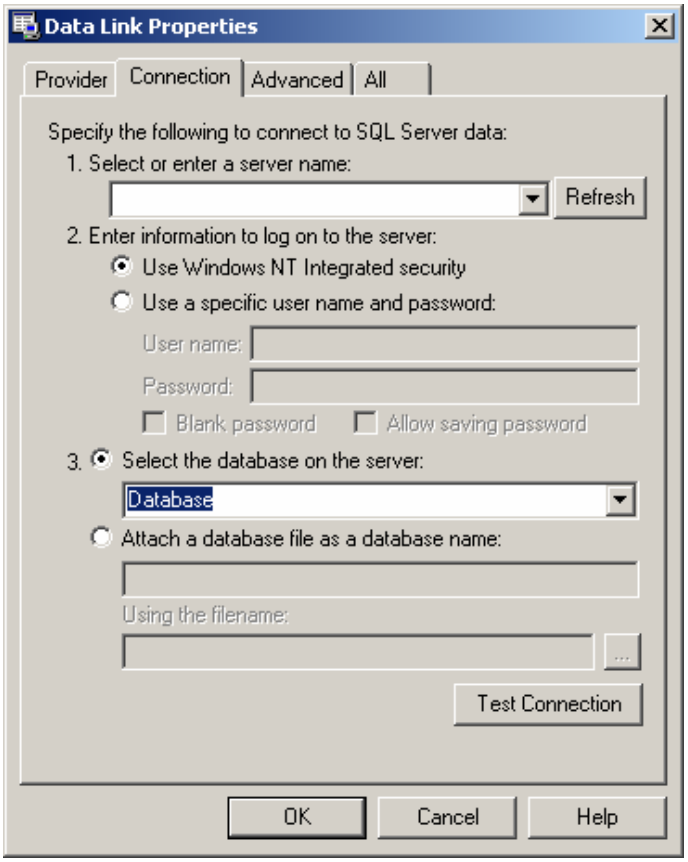


Figure 1.22. Logging on to the SQL Server Database from the Data Link Properties

4. Click the **Test Connection** button. If the test is successful, a message box appears, as shown in **Figure 1.23.** Click **OK.** Then click the **OK** button on the **Data Link Properties** dialog box.

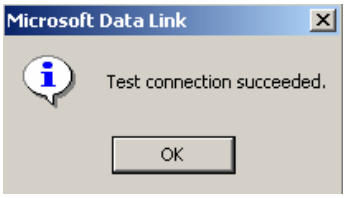


Figure 1.23. Successful SQL Server Test Connection

5. When a connection to the SQL Server database is established, the traffic light icon turns green, and the **Next** button becomes enabled, as shown in **Figure 1.24.** Click the **Next** button to continue.

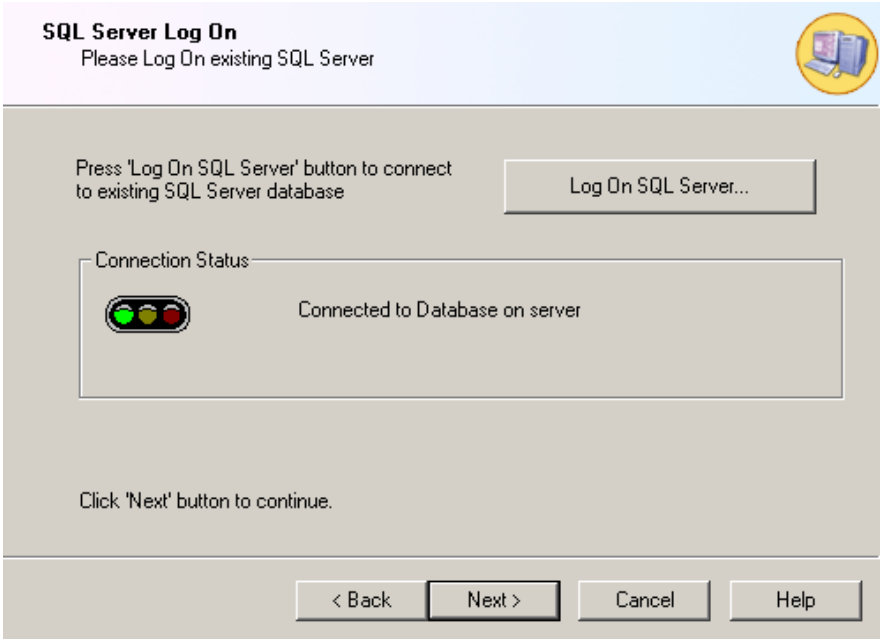


Figure 1.24. Connection to SQL Server Database Established

6. The Wizard inserts Multimedia tables into the selected SQL Server database, as shown in **Figure 1.25.** Click the **Next** button to continue.

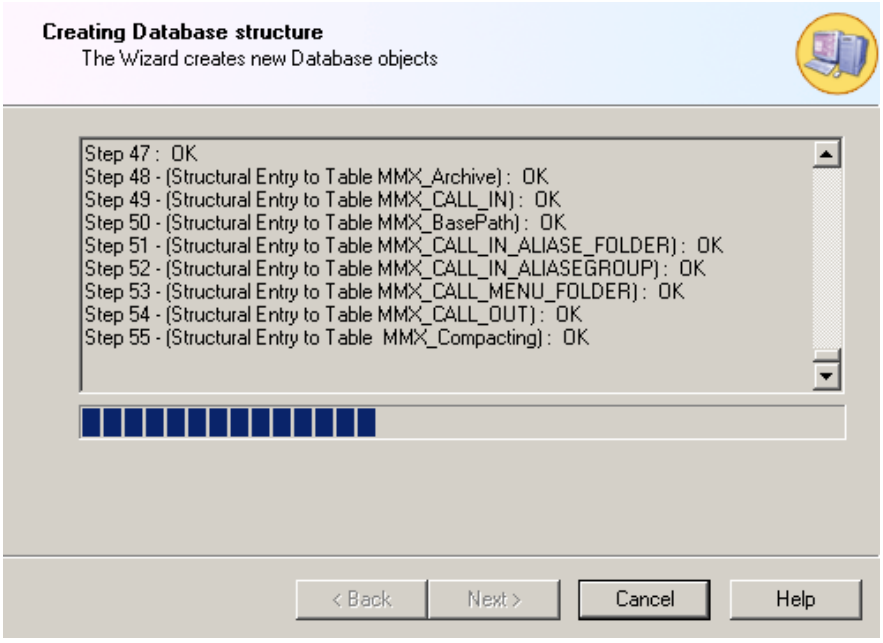


Figure 1.25. Creating Database Structure

7. Enter a name and directory path for the new .udl file in the **Data Link File Name** field, as shown in **Figure 1.26.** You can browse for a directory by clicking the **...** button to the right of this field. Click the **Next** button to save OLE DB connection information in the .udl file.

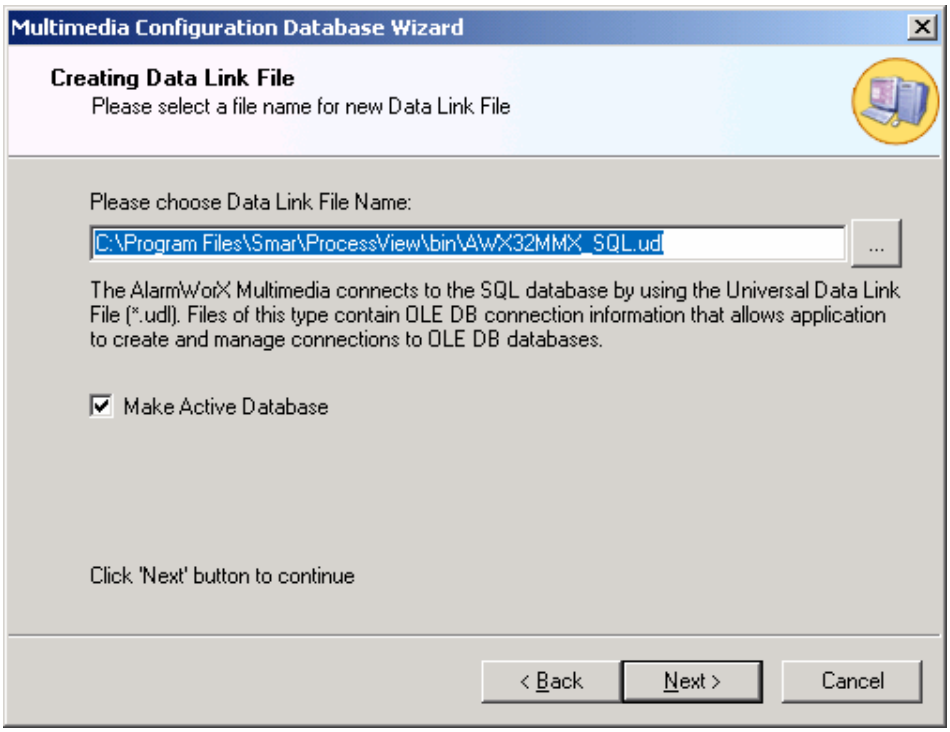


Figure 1.26. Selecting a Directory and File Name for Universal Data Link (.udl) File

8. Once the Universal Data Link has been created, a summary appears, as shown in **Figure 1.27.** Click the **Finish** button to complete the database creation.

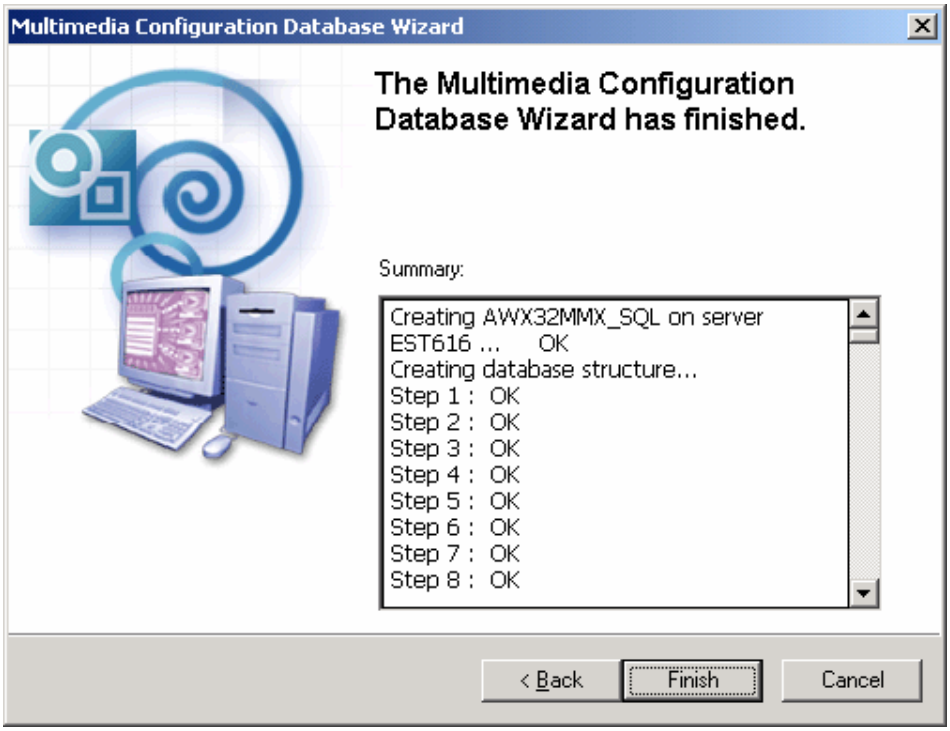


Figure 1.27. Database Creation Complete

1.5 Upgrading Microsoft Access Databases

If you have existing AlarmWorX Multimedia Version 6.1 configuration databases that were created using Microsoft Access, you can still use those databases in Version 7.0, but you must first upgrade those databases to Microsoft SQL Server by doing the following:

1. In the Multimedia Configurator, select **Open** from the **File** menu, as shown in **Figure 1.28.**

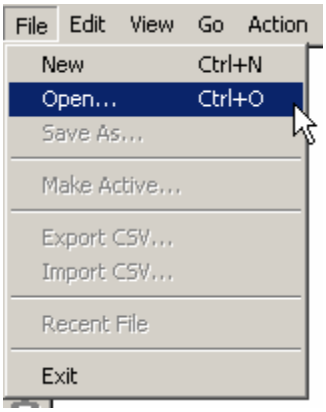


Figure 1.28. Opening the Existing Microsoft Access Database

2. Selecting a Microsoft Access database and then click **Open,** as shown in **Figure 1.29.**

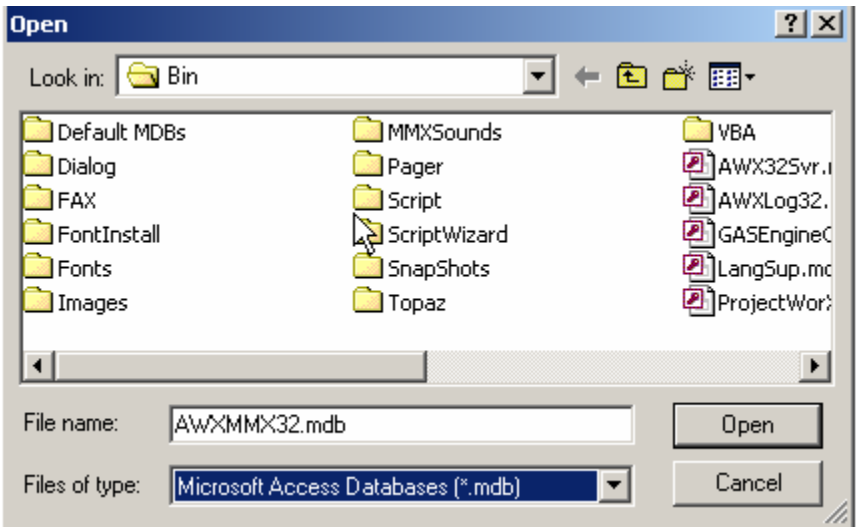


Figure 1.29. Selecting a Microsoft Access Database

3. Click **Yes** to continue, as shown in **Figure 1.30.**

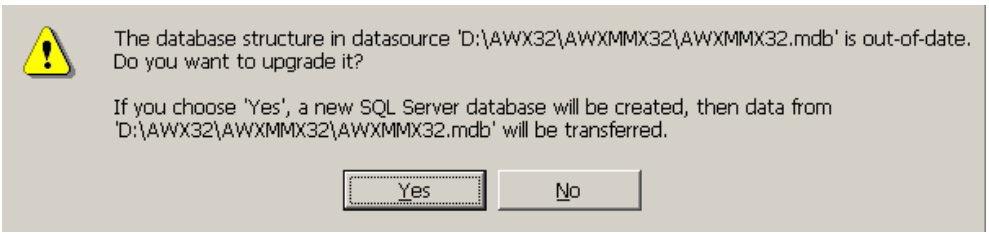


Figure 1.30. Upgrade Notice

4. This opens the Configuration Database Wizard (refer to the section above). Run the Wizard to create a new SQL Server database. Select **I want to create a new Microsoft SQL Server database on local node,** as shown in **Figure 1.31,** and then click the **Next** button to continue.

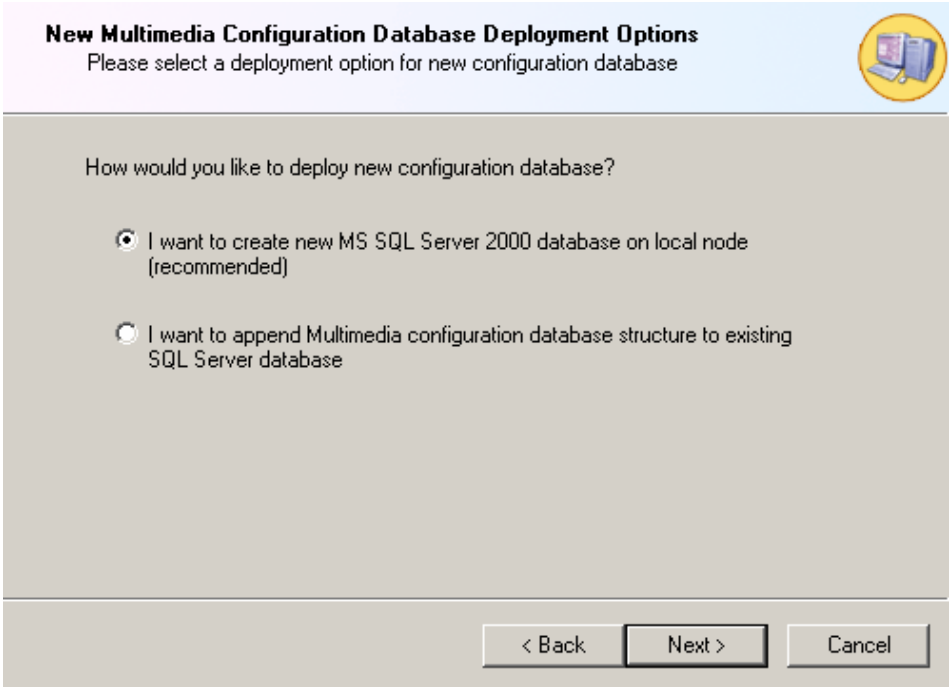


Figure 1.31. Creating a New Microsoft SQL Server Database

5. When you have finished creating the new SQL Server database, the Database Upgrade Summary appears, as shown in **Figure 1.32,** and the database opens the in the AlarmWorX Multimedia Configurator.

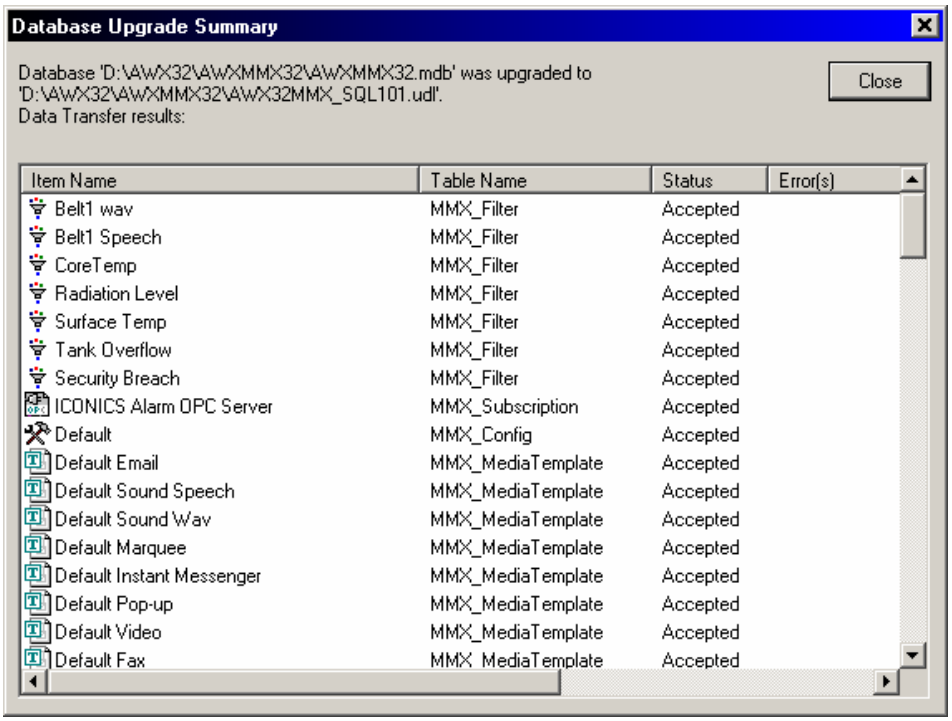


Figure 1.32. Database Upgrade Summary

1.6 Starting the Multimedia Configurator

Once you have finished creating a new configuration database using the Configuration Database Wizard, the Multimedia Configurator screen opens, as shown in **Figure 1.33.** The screen consists of a split window with a tree control view in the left-hand pane and a configuration view in the right-hand pane. The name of the .udl file that you created appears in the title bar of the window. The Configurator provides a standard format for the configuration database, as well as a sample (default) configuration project. The Configurator also includes a toolbar and menus with many command functions. For a description of the toolbar and menu functions, please see the sections below.

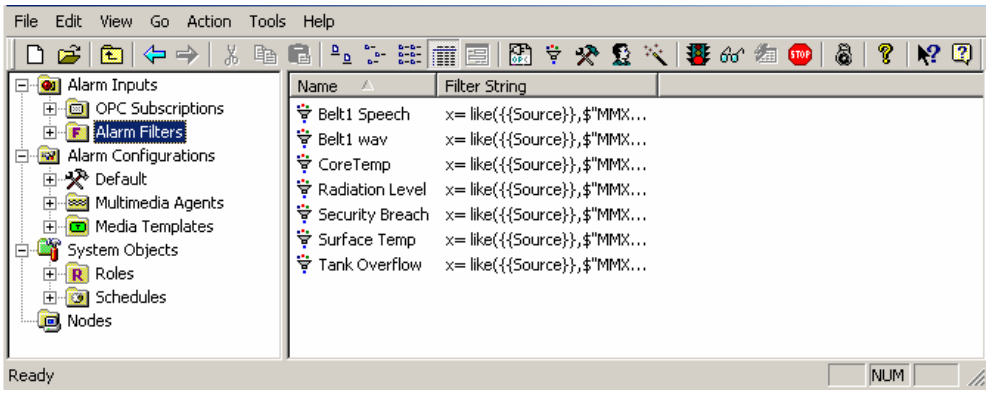


Figure 1.33. AlarmWorX Multimedia Configurator Screen

1.7 Toolbar

The Multimedia Configurator toolbar, shown below, contains the following command buttons. To show or hide the toolbar, select **Toolbars > Standard Buttons** from the **View** menu. For more information on menu functions, please refer to the "Menus" section below.

New: Creates a new database.

Open: Opens an existing database.

Up One Level: Moves up one level in the tree view.

Navigate Back: Jumps to the last screen viewed.

Navigate Forward: Jumps to the next screen viewed.

Cut: Deletes current selection, sending it to the clipboard.

Copy: Copies the current selection to the clipboard.

Paste: Pastes the current contents of the clipboard.

Large Icons: View items as large icons.

Small Icons: View items as small icons.

List: View items as a list.

Details: View items as a list with details.

Dialog View: View additional configuration options.

Insert New Subscription: Configure a new subscription to an OPC server.

Insert New Filter: Configure a new alarm filter.

Insert New Configuration: Set up a new alarm configuration.

Multimedia Assistant: Starts/stops the Icon-Nick Multimedia Assistant.

Multimedia Configuration Wizard: Launches the Multimedia Configuration Wizard.

Start/Stop Multimedia Server: Starts/stops the Multimedia Server.

Monitor View: Adds a window to show alarms.

Update Server Data: Updates the Multimedia Server of any changes while running.

Clear Queues: Cancels all multimedia agent queues to the Multimedia Server.

Security Administration: Configures Security Server settings for the Call-in Agent.

About: Displays information about the application.

Help: Displays context-sensitive help.

Help Topics: Launches online help for the application.

1.8 Menus

The menu bar of the AlarmWorX Multimedia Configurator contains the following menus:

- File
- Edit
- View
- Go
- Action
- Tools
- Help

1.8.1 File Menu

The **File** menu commands are listed in **Table 1.1.**

Table 1.1. File Menu Commands

Command	Shortcut Keys	Function
New	CTRL+N	Creates a new Microsoft Data Link (.udl) file through the Configuration Database Wizard.
Open	CTRL+O	Opens a Microsoft Data Access (.mdb) or Microsoft Data Link (.udl) file, which allows you to connect to any OLE database source, such as a SQL database.
Save As		Saves the current database.
Make Active		Makes the current database active. If this command is not available, then the current database is already the active database.
Export CSV		Exports configuration data from your database to a text file. You can specify the delimiters and what to export.
Import CSV		Imports data into your database from a text file. You can then specify the delimiters and choose from the following import settings:
Exit		Closes the application.

Exporting Configuration Data

The Configurator offers the flexibility of exporting data from your configuration database to a text (.txt) file or a Microsoft Excel (.csv) file. To export data, select **Export CSV** from the **File** menu. This opens the **Export Configuration Data to File** dialog box, as shown in **Figure 1.34.** You can then specify the delimiters for exporting the data. Unless you specify delimiters in the **Export Configuration Data to File** dialog box, the file will use **Commas** as delimiters by default. Each group contains headings and columns that provide information about each item, such as descriptions and associated translations and expressions. It also provides the "tree" pathway for each item. Choose the directory to which you want to export the data from your database. In the **Save As Type** field, choose the file type (.txt or .csv) that you would like to save.

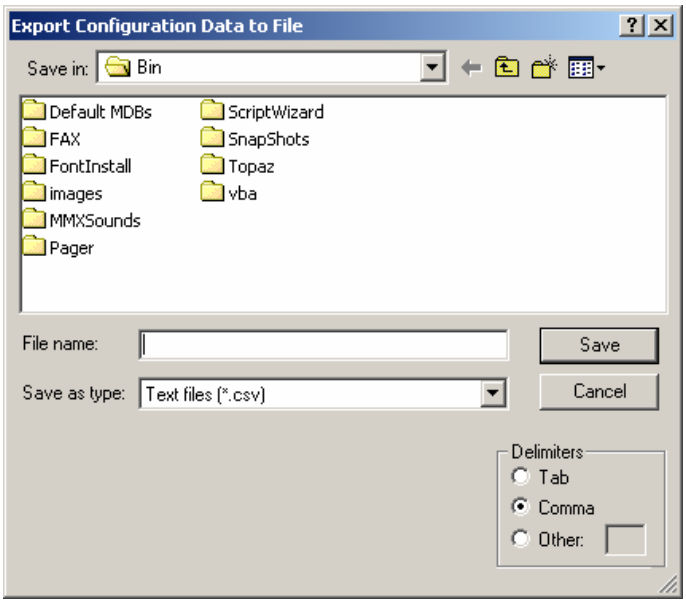


Figure 1.34. Exporting Configuration Data

Importing Configuration Data

The Configurator offers the flexibility of importing data from a text (.txt) file or a Microsoft Excel (.csv) file to your configuration database. To import data, select **Import CSV** from the **File** menu. This opens the **Import Configuration Data From File** dialog box, as shown in **Figure 1.35.** You can then specify the delimiters and choose from the following import settings:

- **Create new items.** When the import file contains items that are not yet in the configuration database, then it will create them. Otherwise it will skip these items.
- **Update existing items.** When the import file contains items that are in the configuration database, then it will update them using data from the import file. Otherwise it will skip these items.
-
- **Note:** Either **Create new items** or **Update existing items** must be selected. Otherwise there is nothing to import.
-
- **Display errors.** When this item is checked, the Configurator will show a dialog box if an error occurs, and then will ask you if you want to proceed with the import. When it is not checked, it will skip all items where an error occurred.

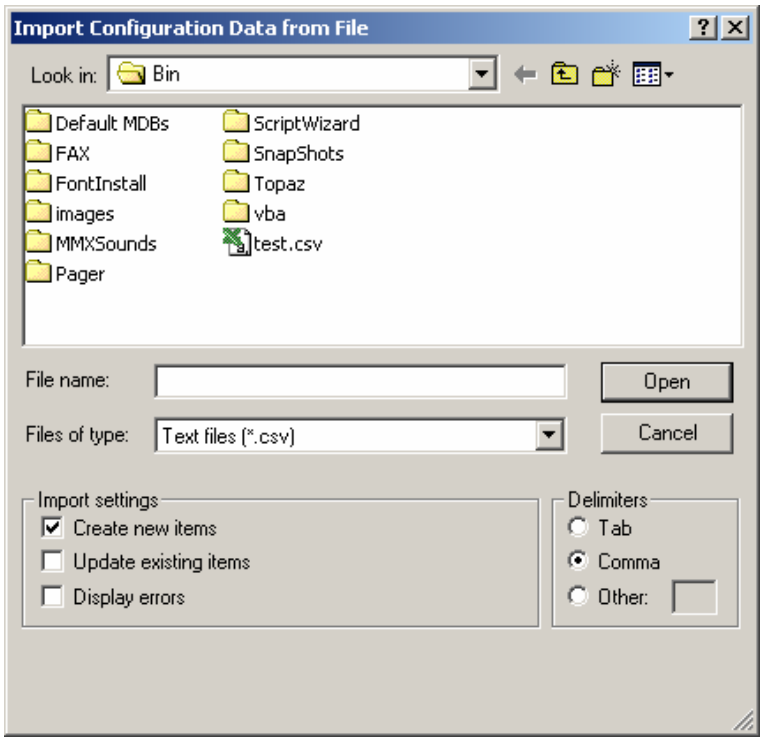


Figure 1.35. Importing Configuration Data

When you have selected a file to import, click **Open.** When the import is completed, the **File Import Results** dialog box will open, as shown in **Figure 1.36.** This shows the import settings, including the input file name. It also provides a summary of the import, including how many items were inserted, updated, or rejected, and shows how many errors occurred.

Click the **...** button to the right of each field to get the details view of the import results, as shown below. This view shows the specific items that were inserted, updated, or rejected, as well as a description of any errors that occurred.

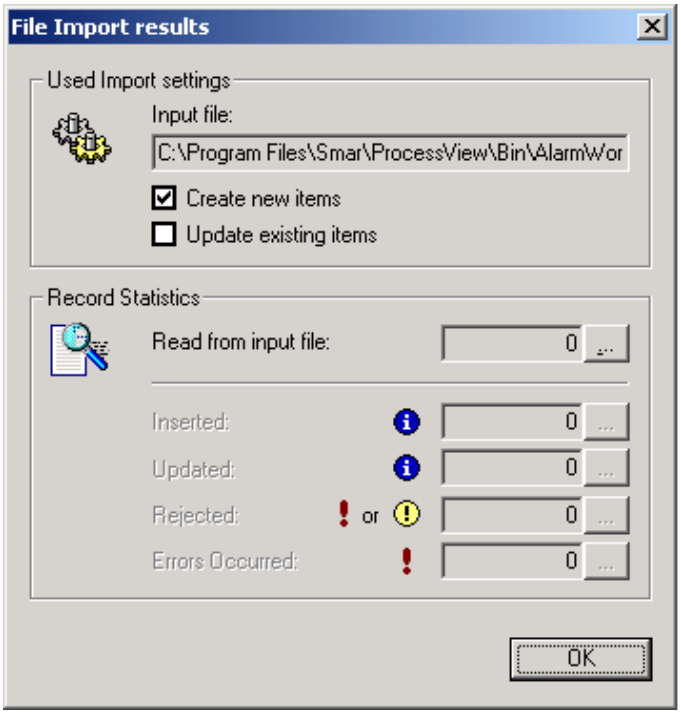


Figure 1.36. File Import Results Dialog Box

1.8.2 Edit Menu

The **Edit** menu commands are listed in **Table 1.2.**

Table 1.2. Edit Menu Commands

Command	Shortcut Keys	Function
New		Creates a new item depending on what is selected in the tree view.
Rename	CTRL+R	Renames the selected object.
Multiply	CTRL+M	Multiplies the selected object or item.
Delete	CTRL+DEL	Deletes the selected object.
Cut	CTRL+X	Cuts the selected object from the view and places it on the clipboard.
Copy	CTRL+C	Copies the selected object to the clipboard.
Paste	CTRL+V	Pastes the last object placed on the clipboard.
Select All	CTRL+A	Selects all objects in a list. The selection is shown in the upper-right-hand section of the viewer.
Invert Selection		Unselects all selected items and selects all unselected items in a list in the upper-right-hand section of the viewer.

1.8.3 View Menu

The **View** menu commands are listed in **Table 1.3.**

Table 1.3. View Menu Commands

Command	Shortcut Keys	Function
Toolbar		Displays the toolbar.
Status Bar		Toggles the status bar.
Large Icons	F7	Displays the items in the list as small icons.
Small Icons	F8	Displays the items in the list as small icons.
List	F9	Displays the items in a list.
Details	F10	Displays the items along with detailed information about the configuration of each item.
Dialog View	F11	Toggles the configuration window (right-hand pane).
Monitor View	F12	Shows/hides the Multimedia Server runtime monitor. (See **Chapter 8.**)
Sort By		Displays a list of options for sorting the columns in the right-hand pane of the screen. The options listed depend on the level within the view.
Show/Hide Columns		Displays a list of options that you can choose to show or hide in the view.
Select Language		Allows you to select the language to be used in the Configurator from the **Select Language** dialog box. Select the language you wish to use for your system and click **OK.** For navigation purposes, use the buttons and check boxes in the **List** section.
Global Refresh	F5	Refreshes the data for the entire Configurator screen.
Subtree Refresh	CTRL+F5	Refreshes only the data contained in the currently selected subtree.

Selecting Languages

The **Select Language** function on the **View** menu allows you to choose which language to use in your display. Choosing **Select Language** from the **View** menu opens the Select Language dialog box, shown in **Figure 1.37.**

Note: A language resource .dll must be installed for language switching to work.

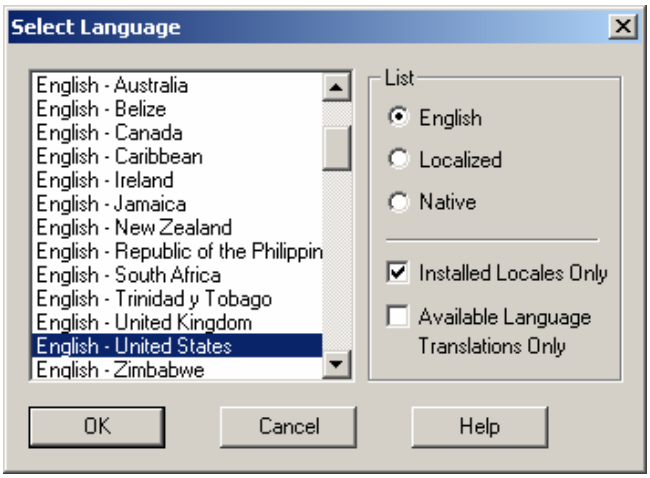


Figure 1.37. Select Language Dialog Box

Define the parameters listed in the table below. Then click **OK** to return to the work area.

Select Language Parameters

Parameter	Description
List	Lists available languages. Depending on which item you have selected, the view on the left will change. If **English** is checked, the languages will appear as their English name. If **Localized** is checked, the languages will appear with the native country in parentheses (for languages with several dialects only). When **Native** is checked, the languages are displayed the way they would be written in that language.
Installed Locales Only	If this is checked, local languages appear in the box.
Available Language Translations Only	Checking this box allows you to choose from available language translations only.

1.8.4 Go Menu

The **Go** menu commands are listed in **Table 1.4.**

Table 1.4. Go Menu Commands

Command	Shortcut Keys	Function
Up One Level		Moves the cursor up one level.
Item Above	ALT+Up Arrow	Moves the cursor to the next item up in the tree view.
Item Below	ALT+Down Arrow	Moves the cursor to the next item down in the tree view.
Previous Item		Moves the cursor back to the last item selected.
Next Item		Opens the next item in the tree view.
Expand Item	ALT+Left Arrow	Expands an item that contains a submenu.
Collapse Item	ALT+Right Arrow	Collapses an item that contains a submenu.
Page Up	ALT+PgUp	Moves the cursor up to the first item in the tree.
Page Down	ALT+PgDown	Moves the cursor down to the last visible item in the tree.
Home	ALT+Home	Moves the cursor up to the first item in the tree.
End	ALT+End	Moves the cursor down to the last visible item in the tree.
Next Pane	F6	Moves the cursor to the next pane.
Previous Pane	SHIFT+F6	Moves the cursor to the last pane used.

1.8.5 Action Menu

The **Action** menu commands are listed in **Table 1.5.**

Table 1.5. Action Menu Commands

Command	Function
Start Multimedia Server	Enters the Multimedia Server into runtime mode. For information on runtime operations, please see **Chapter 8.**
Stop Multimedia Server	Stops the Multimedia Server and exits runtime mode.

1.8.6 Tools Menu

The **Tools** menu commands are listed in **Table 1.6.**

Table 1.6. Tools Menu Commands

Command	Function
Options	Launches the **Options** dialog box. For more information about the **Options** dialog box, please see **Chapter 7.**
Multimedia Configuration Wizard	Launches the **Alarm Configuration Wizard,** which guides you through the steps for alarm configuration. (See **Chapter 3** for details.)

1.8.7 Help Menu

The **Help** menu commands are listed in **Table 1.7.**

Table 1.7. Help Menu Commands

Command	Shortcut Keys	Function
Help Topics	F1	Launches the online Help for the Smar Multimedia Configurator.
What's This?	SHIFT+F1	Displays context-sensitive help.
Multimedia Assistant		Starts the Icon-Nick Multimedia Assistant, which provides interactive, text-to-speech help.
About Application		Launches the **About Box,** which contains information about the product version number, copyright, and available disk space. It also contains information about how to contact Smar.

1.9 Adding, Reinstalling, and Uninstalling Components

The following procedure explains how you can update your AlarmWorX Multimedia installation at any time.

1. Select **Settings > Control Panel** from the Windows **Start** menu.
2. In the Control Panel, select **Add/Remove Programs.**
3. This opens the Windows **Add/Remove Programs** dialog box, as shown in **Figure 1.38.** To make changes to the Multimedia installation, select **Multimedia Alarming** and click the **Change/Remove** button.

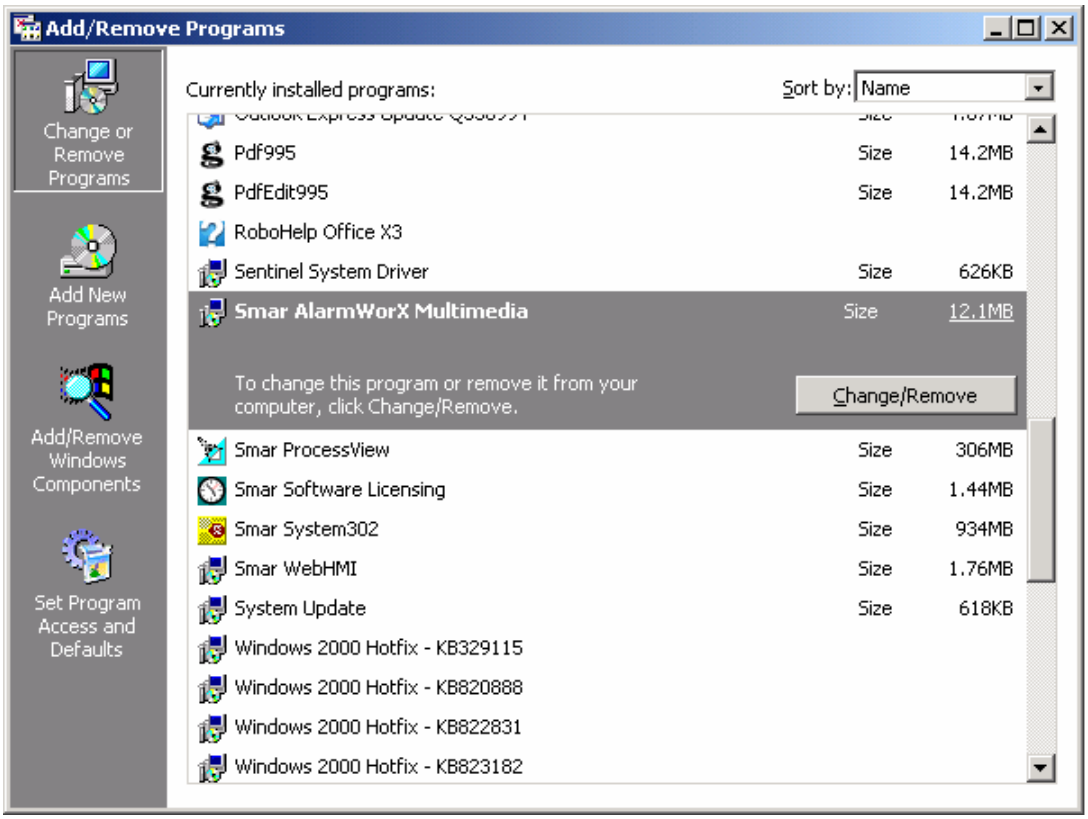


Figure 1.38. Windows Add/Remove Programs Dialog Box

4. This opens a **Setup** dialog box that allows you to select whether to modify, repair, or remove AlarmWorX Multimedia, as shown in **Figure 1.39.**

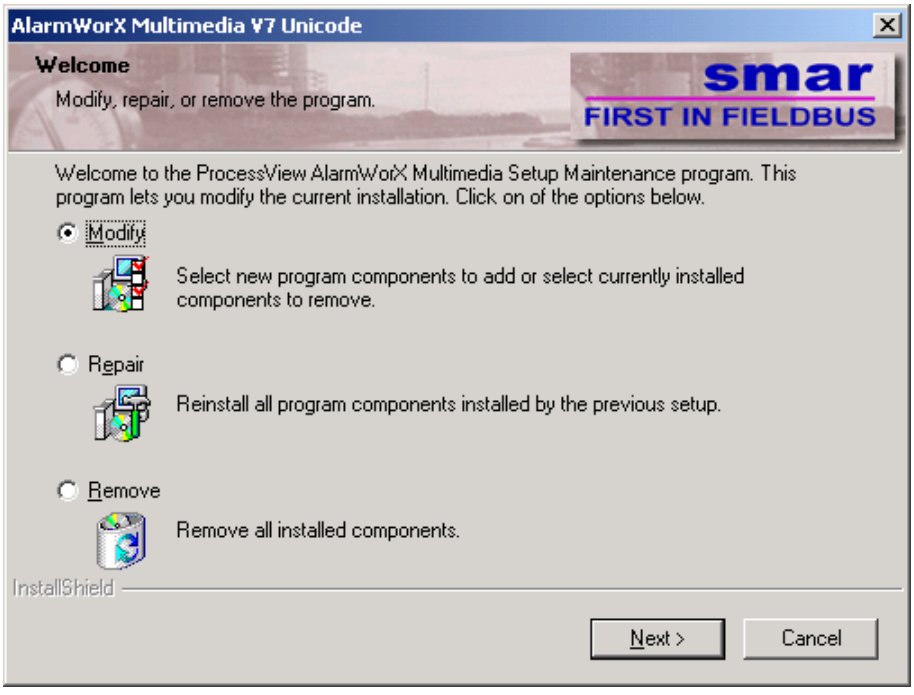


Figure 1.39. Multimedia Setup Options

5. To add or remove specific program components, select **Modify** and then click the **Next** button. This opens the **Select Components** dialog box, where you can select which agents to add to or remove from the installation.

6. To repair a corrupted installation, select **Repair** from the **Setup** dialog box. Then click **Next** to reinstall all program components.

7. To uninstall all program components, select **Remove** from the **Setup** dialog box. Then click the **Next** button. A dialog box then asks you if you wish to uninstall AlarmWorX Multimedia. Click **OK** to uninstall the application.

8. When you have finished modifying, repairing, or uninstalling components, the **Maintenance Complete** dialog box appears.

1.10 Multimedia Demo

Examples of multimedia alarming agents are provided in the **Multimedia Demo.** You must have Smar GraphWorX installed to run this demonstration. To view these examples, open the "MMXDemo.gdf" file in the "Smar/ ProcessView/Examples/Multimedia Demo" directory. You can also open the Multimedia Demo from the Windows **Programs** menu by selecting **Smar > ProcessView > AlarmWorX > Multimedia Demo.**

Chapter 2

Creating Alarm Configurations

2.1 Basic Steps for Creating an Alarm Configuration

This chapter provides a quick walk-through of how to create a basic alarm configuration. The following are suggested procedures for quickly and easily using the alarm Configurator's power and flexibility to develop a new alarm configuration. This chapter covers the following steps. More advanced options, such as templates and roles with scheduling, are discussed in later chapters.

Step 1. Create a subscription to an OPC Alarm and Event server.

Step 2. Create an alarm filter.

Step 3. Create a multimedia agent.

Step 4. Create an alarm configuration.

Step 5. Create an action set.

Step 6. Make the database active.

Step 7: Start the Multimedia Server.

For additional help on any of these steps, select **Multimedia Assistant** from the **Help** menu. Follow the instructions provided by the Multimedia Assistant.

As an alternative, the Multimedia Configuration Wizard provides a simple walk-through that guides you through the steps above in a condensed, user-friendly fashion. Using the Multimedia Configuration Wizard simplifies the above process down to two steps:

Step 1. Use the Multimedia Configuration Wizard to create an alarm configuration. (See **Chapter 3.**)

Step 2. Make the database active.

Step 3: Start the Multimedia Server.

Note: In order to allow intranet/Internet-based alarm subscriptions or alarm notification, you will need to configure either DCOM or TCP/IP communications. For more information, please refer to the GenBroker or WebHMI help documentation.

2.2 Creating a Subscription

The first step in creating an alarm configuration is to create a subscription, which defines a connection to an alarm server. A subscription specifically describes alarms in which the Multimedia component is interested. To create a subscription to one or several OPC Alarm and Event servers, do the following:

1. Click the **Insert New Subscription** button on the Configurator toolbar, or right-click the **OPC Subscriptions** folder (found under the **Alarm Inputs** folder on the tree control) and select **New > OPC Subscription** from the pop-up menu, as shown in **Figure 2.1.**

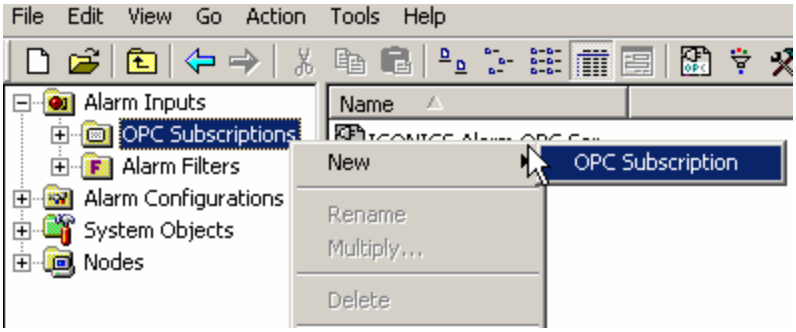


Figure 2.1. Creating a New Subscription

2. Type in the new subscription name, as shown in **Figure 2.2.**
3. Click the **Subscribe/Edit** button to open the **Subscription Properties** dialog box.
4. When you have finished configuring the subscription properties, click **OK.**
5. Click **Apply.**

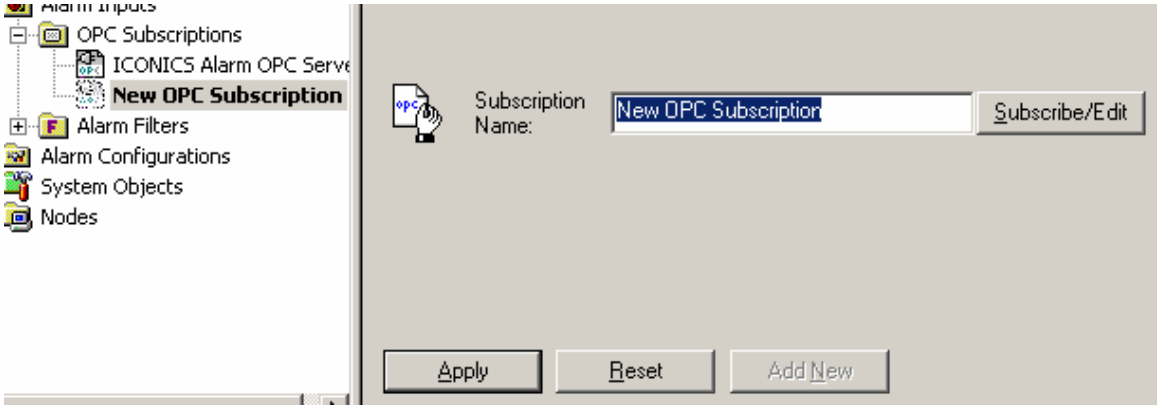


Figure 2.2. Naming the New Subscription

2.2.1 Subscription Properties

Clicking the **Subscribe/Edit** button in the subscription field opens the **Subscription Properties** dialog box, shown in **Figure 2.3.** The **Subscription** tab determines what type of OPC connection will be made. It allows you to add, rename, delete, or edit a subscription to a particular OPC Alarm and Event Server. To add a new subscription, click the **Add** button.

The subscription named "New Subscription" appears, as shown in Figure 2.3. This subscription does not contain any data, so it is necessary to immediately edit the new subscription. To do so, click the **Edit** button to open the **Event Subscription** dialog box, shown in **Figure 2.3.** It is only possible to add or edit subscriptions that are connected to active OPC Alarm and Event servers.

Note: It is possible for a server to have more than one subscription. In fact, it is a very effective way to achieve filtering.

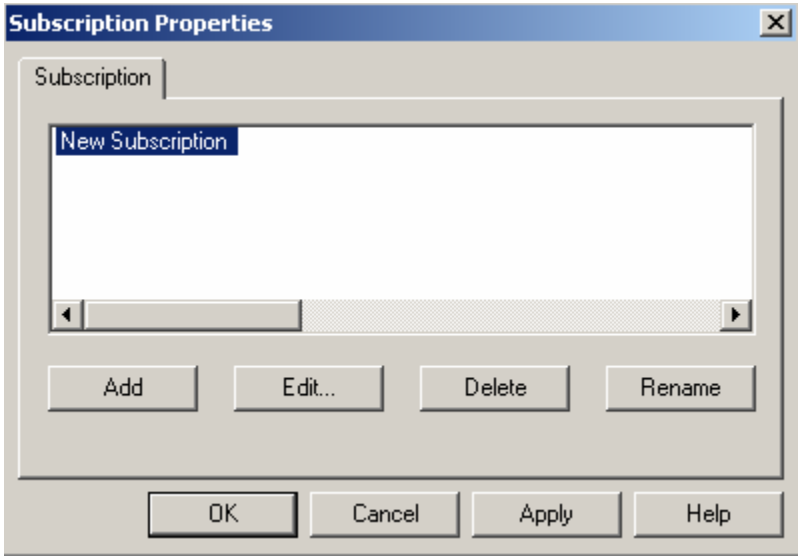


Figure 2.3. Subscription Properties Dialog Box

Server Tab

The **Server** tab of the **Event Subscription** dialog box, shown in **Figure 2.4,** allows you to select an **Event Server** and **Node** for each subscription. To select the event server, click the **Browse** button.

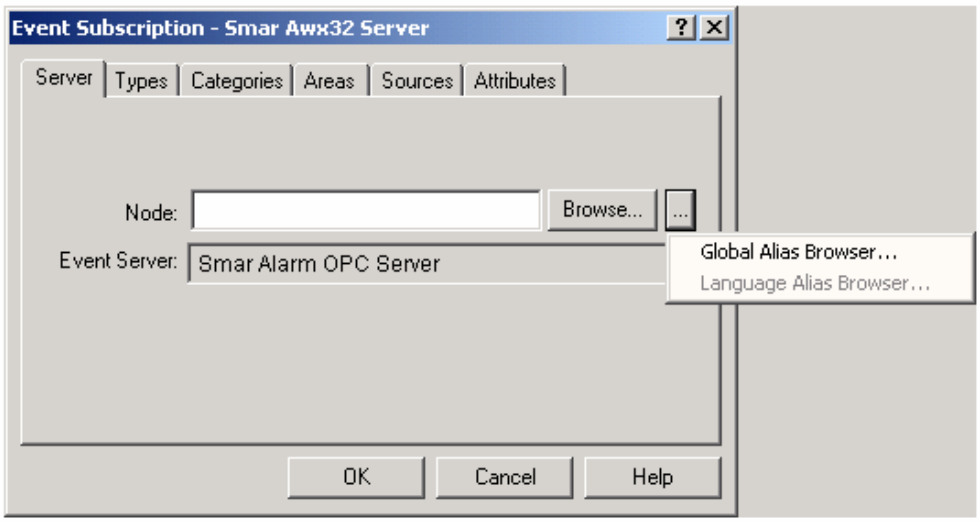


Figure 2.4. Event Subscription Dialog Box: Server Tab

This opens the **OPC Universal Tag Browser,** shown in **Figure 2.5,** which lists all available Alarm and Event OPC servers. Select the desired server, and click **OK.** For local servers, it is not necessary to fill in the **Node** field.

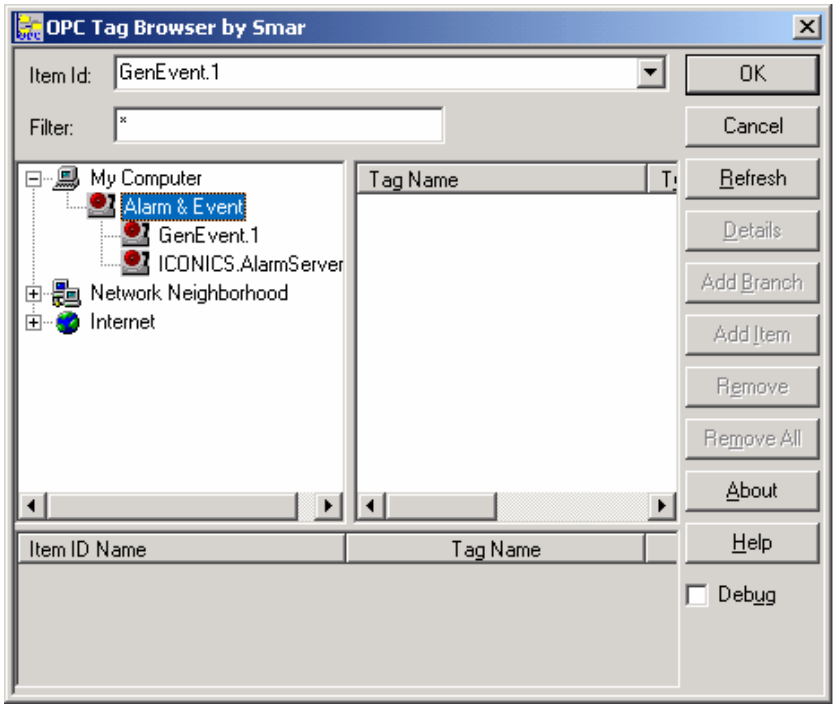


Figure 2.5. Selecting an Alarm and Events Server From the Tag Browser

You can also select global aliases to use in the **Node** field. Clicking the **...** button and selecting **Global Alias Browser** from the pop-up menu opens the Global Alias Browser, as shown in **Figure 2.6.** Select a global alias from the Global Alias Browser, which includes all global aliases in the global alias database. This eliminates the need to manually type in the alias name. All global aliases that are configured in the Global Alias Engine Configurator are conveniently available to choose from inside the browser. The tree control of the Global Alias Engine Configurator is mimicked in the tree control of the Global Alias Browser. Select a global alias by double-

clicking the alias name (e.g. "Floor" in the figure below). The alias name appears at the top of the browser, which automatically adds the <# and #> delimiters to the alias name. Click the **OK** button.

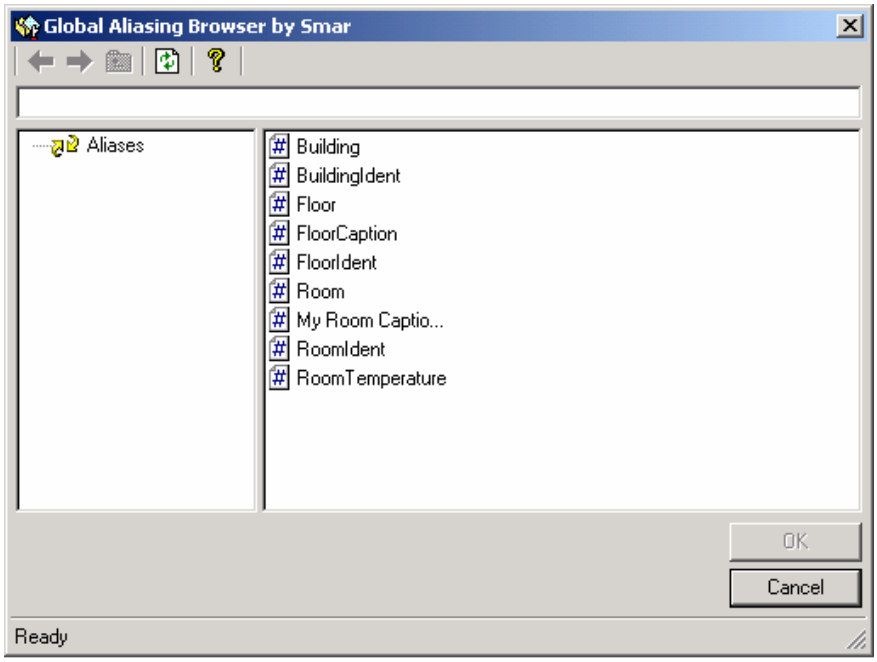


Figure 2.6. Selecting an Alias From the Global Alias Browser

Types Tab

The **Types** tab of the **Event Subscription** dialog box, shown in **Figure 2.7,** allows you to configure which OPC-defined event types each subscription should have, as well as to set the ranges for severity (priority). A value of "0" represents the low severity value, and "1000" represents the high severity value. Please note that OPC Alarm and Event (AE) servers are required to scale severity values to the OPC ranges (i.e. an AE server that contained two severity ranges would convert these to "0" and "1000").

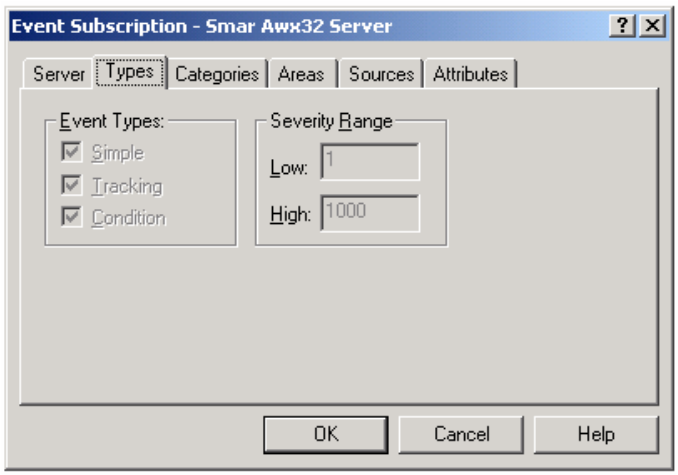


Figure 2.7. Event Subscription Dialog Box: Types Tab

Simple: These messages state information but do not have alarm status, nor do they contain information on what initiated the message. This includes the following information: Source, Time, Type, EventCategory, Severity, Message, Cookie, and server-specific items.

Example: "FIC101, 12:0:0 1/1/99, Simple, Category1, 100, 'Shift Change', 1"

Simple messages would be similar to an event.

Tracking: These messages contain the additional information of the client that initiated the event. This includes the following information: Source, Time, Type, EventCategory, Severity, Message, Cookie, ActorID, and server-specific items.

Example: "FIC101, 12:0:1 1/1/99, Tracking, Category1, 300, 'Pump pressure Set to 10 psi', 1, Station 12"

Tracking messages are similar to event messages in that the cause of the event is important. An example would be an operator changing a setpoint value. This type of message does not include acknowledge capability.

Note: Simple and tracking messages are removed from the alarm viewer via the acknowledge mechanism.

Condition: These messages contain all of the above information but also include an acknowledgement portion. This includes the following information: Source, Time, Type, EventCategory, Severity, Message, Cookie, ConditionName, SubConditionName, ChangeMask, NewState, ConditionQuality, AckRequired, ActiveTime, ActorID and server-specific items.

Example: "FIC101, 12:0:3 1/1/99, Condition, Category1, 700, 'Pump pressure to high', 1, Limit, HiHi, 1,Active Enabled, Good, TRUE, 12:0:2 1/1/99"

Condition messages would be considered a "typical" alarm message with acknowledge capability.

For further details on any of the included information, please refer to the OPC Alarm and Events specification.

Categories Tab

The **Categories** tab of the **Event Subscription** dialog, shown in **Figure 2.8,** allows you to select the categories for a subscription. Select the category from the list of available categories, and then click the **Add ->** button. The category will appear in the **Subscribed** list. To remove a category from this list, select it in the **Subscribed** list and click the **<- Remove** button. If no categories are listed in the **Subscribed** list, then all categories are selected by default. However, adding "Digital" and "Rate of Change," for example, to the list tells the OPC Alarm and Events Server to deliver only those alarm messages to the Multimedia Server. This is a “first-pass” filter on the server side.

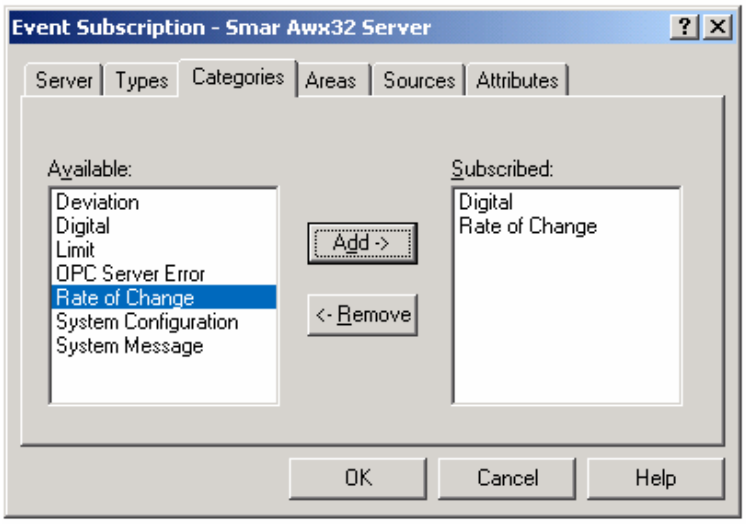


Figure 2.8. Event Subscription Dialog Box: Categories Tab

Event Types and Categories

All events generated are of the OPC defined Event Type **Condition.** The AlarmWorX Server defines the following **Event Categories** and uses the identical names for the **Condition Names:**

- Deviation
- Digital
- Limit
- Rate of Change

The **Limit** and **Deviation** conditions have the following Sub-conditions:

- HiHi
- Hi
- Lo
- LoLo

Note: The following categories are not used in the SMAR Alarm Server:

- OPC Server Error
- System Configuration
- System Message

Areas Tab

Use the **Areas** tab of the **Event Subscription** dialog box, shown in **Figure 2.9,** to select an area or a group of areas for filtering in a subscription. An **area** is used to group OPC alarm tags. This information can be used by clients for filtering purposes. A tag can exist under multiple areas, and an area can have a multiple levels. An area is defined by its name and the name of its parent branches. For example, a branch called Area 1 under plant Area A is different from Area 1 under plant Area B. Areas can be configured in the AlarmWorX Server Configurator.

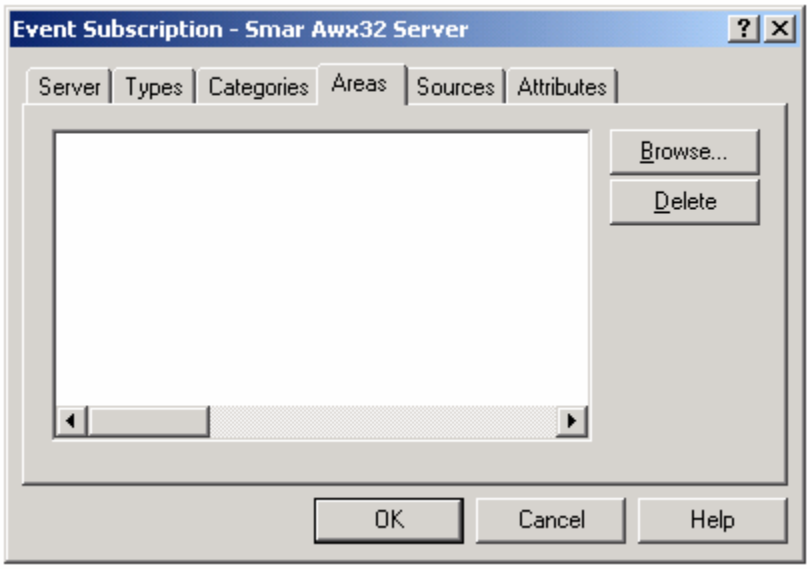


Figure 2.9. Event Subscription Dialog Box: Areas Tab

Clicking the **Browse** button opens the **OPC Event Server Area / Source Browser,** shown in **Figure 2.10,** which lists all available areas for your event server. Area subscription supports wildcards, which subscribe to the format of the Microsoft Visual Basic 'like" command. For example, "Area1*" will subscribe to all alarm areas that contain strings beginning with "Area1". "Area1*" will subscribe to the root area and its "child" areas. A detailed explanation of the wildcard support can be found in the OPC Alarm and Events documentation. It is recommended that you thoroughly read the wildcard documentation before attempting to use complicated expressions.

Note: For the like operator: "string" equals the string to search in; "pattern" equals the string to search for (can include wildcards); nonzero for case-sensitive search; zero for case-insensitive search. String syntax is $"string"$.

You can use these special characters in pattern matches in string:

- ? Any single character.
- Zero or more characters.
- # Any single digit (0-9).
- [charlist] Any single character in charlist.
- [!charlist] Any single character not in charlist.

It is also possible to delete an area from the **Areas** tab. To delete an area, select it from the list of areas for this particular subscription, and then click the **Delete** button. Not all OPC Alarm and Event servers support area filtering as part of the subscription.

Note: If no areas are listed, then all areas are selected by default.

Note: It is recommended that you have an area in the alarm server to which you subscribe; this ensures that the relevant multimedia alarms are received. Any available areas listed in the active Alarm Server configuration database are available to choose from in the Area/Source Browser.

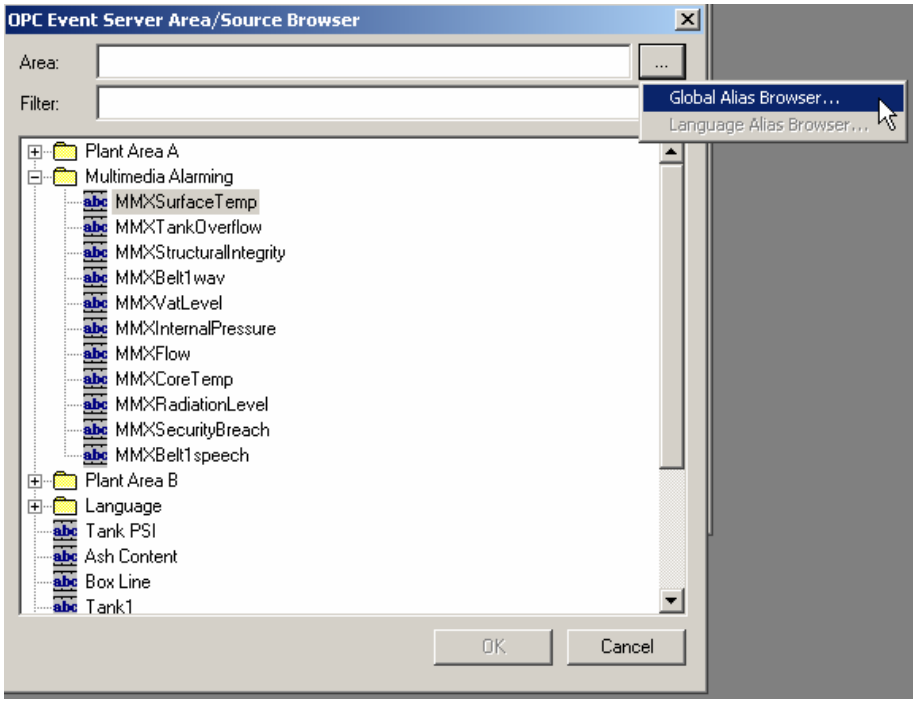


Figure 2.10. OPC Event Server Area/Source Browser

You can also select global aliases to use in the **Area** field. Clicking the **...** button and selecting **Global Alias Browser** from the pop-up menu opens the Global Alias Browser, as shown in **Figure 2.11.** Select a global alias from the Global Alias Browser, which includes all global aliases in the global alias database. This eliminates the need to manually type in the alias name. All global aliases that are configured in the Global Alias Engine Configurator are conveniently available to choose from inside the browser. The tree control of the Global Alias Engine Configurator is mimicked in the tree control of the Global Alias Browser. Select a global alias by double-clicking the alias name (e.g. "Floor" in the figure below). The alias name appears at the top of the browser, which automatically adds the <# and #> delimiters to the alias name. Click the **OK** button.

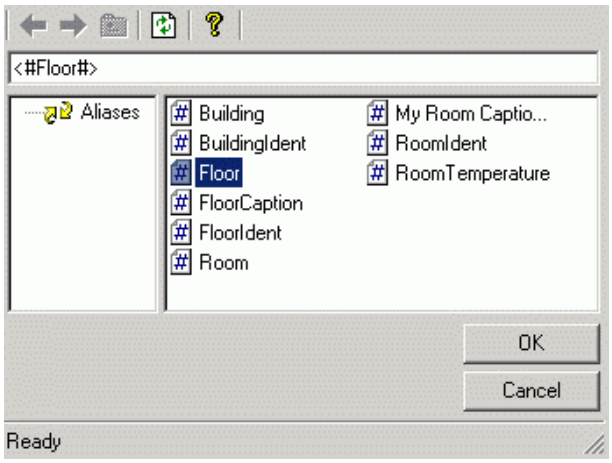


Figure 2.11. Selecting an Alias From the Global Alias Browser

Clicking the **...** button and selecting **Language Alias Browser** from the pop-up menu opens the Language Alias Browser, as shown in **Figure 2.12.** The browser includes all languages aliases in the language database. All language aliases that are configured in the Language Configurator are conveniently available to choose from inside the browser. The tree control of the Language Configurator is mimicked in the tree control of the Language Alias Browser. Select a language alias by double-clicking the alias name. The alias name appears at the top of the browser, which automatically adds the /+ and +/ delimiters to the alias name. Click the **OK** button.

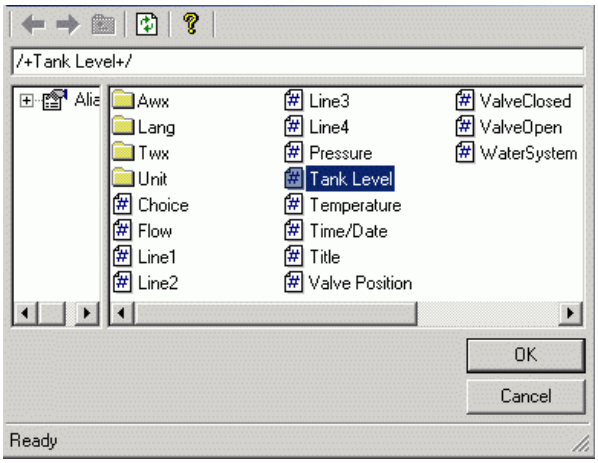


Figure 2.12. Selecting an Alias From the Language Alias Browser

Sources Tab

The **Sources** tab of the **Event Subscription** dialog box, shown in **Figure 2.13,** allows you to filter on a source or group of sources for a particular subscription. A **source** is an OPC alarm tag in an alarm configuration. In the AlarmWorX Server Configurator, a source can be associated with a particular area (group of alarm tags). It is also possible to delete a source for a particular subscription. To delete a source, select it from the list of sources for this particular subscription and click the **Delete** button. Not all OPC Alarm and Event servers support source filtering as part of the subscription.

Note: If no sources are listed, then all sources are selected by default. Any available sources listed in the active Alarm Server configuration database are available to choose from in the Area/Source Browser, as shown in the figure below.

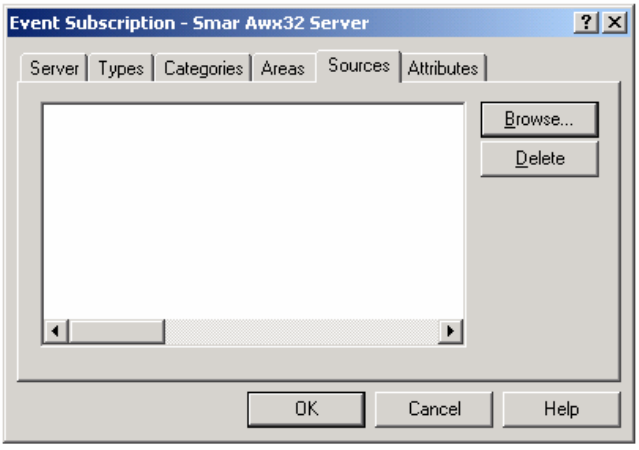


Figure 2.13. Event Subscription Dialog Box: Sources Tab

To select a source, click the **Browse** button and select one from the **OPC Event Server Area / Source Browser,** shown in **Figure 2.14.** Source subscription provides the wildcard support found in the area subscription.

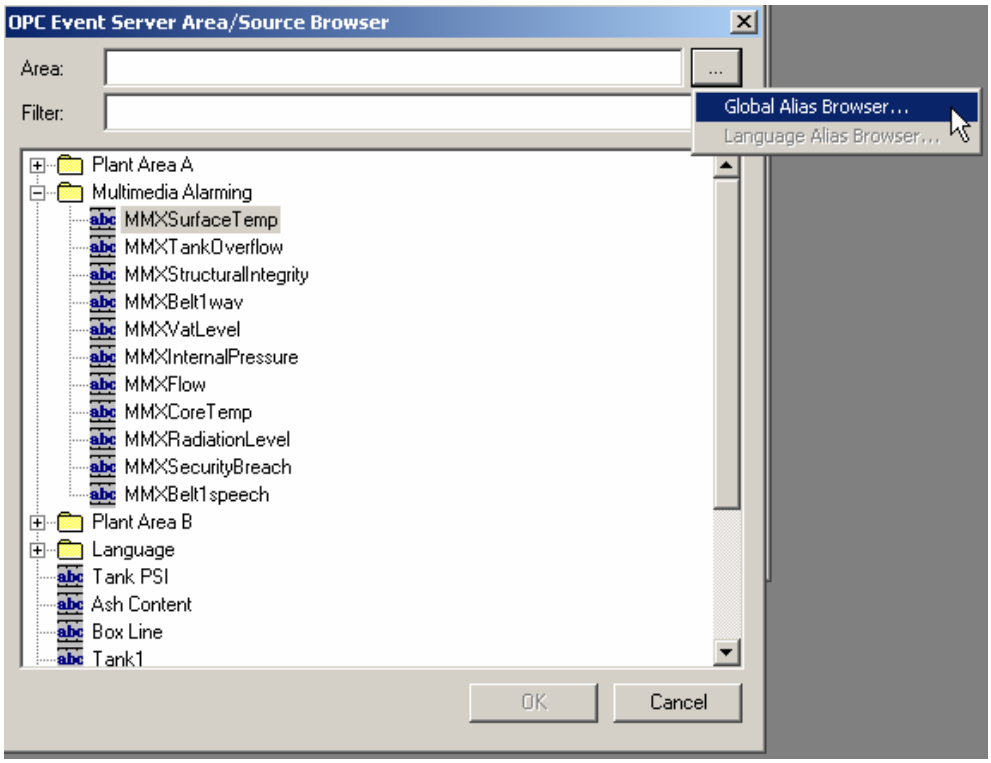


Figure 2.14. OPC Event Server Area/Source Browser

Attributes Tab

The **Attributes** tab of the **Event Subscription** dialog box, shown in **Figure 2.15,** allows you to add extra attributes to a particular event category within a subscription. Select the event category from the corresponding drop-down list. Choose the desired items from the available attributes list, and click the **Add** button. To remove an attribute from the subscribed list, select that particular attribute and click **Remove.**

Note: The following categories are not used in the SMAR Alarm Server:

- OPC Server Error
- System Configuration
- System Message

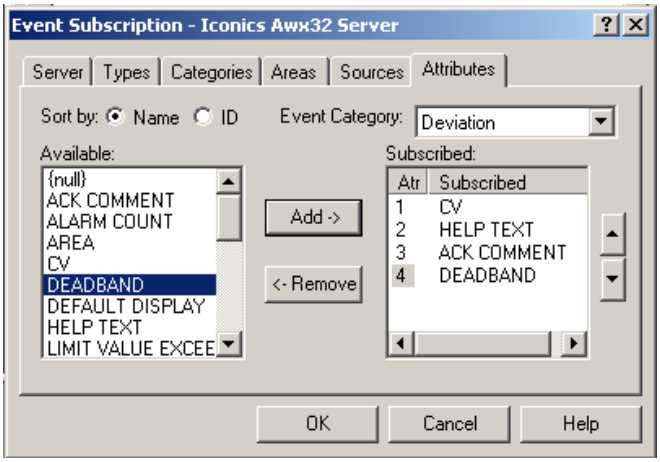


Figure 2.15. Event Subscription Dialog Box: Attributes Tab

It is important to note that the order of the subscribed attributes does matter. The order of the attributes determines the order they will be selected from the alarm server, and also determines with which viewer attribute column they are associated. To change the order of the attributes in the subscribed field, simply select an attribute

and click the "up" and "down" arrow buttons. Server-specific information will be displayed in the Attributes1-n columns. The attributes columns are added in the **Column** tab of the **Alarm Viewer ActiveX Properties** dialog box.

Note: To receive extra attributes, you must request them per event category.

Event Attributes

The following event attributes are made available to subscribing clients:

Attribute	Deviation	Digital	Limit	Rate of Change	Type	Comment
ACK COMMENT	✔	✔	✔	✔	VT_BSTR	Comment entered when alarm was last acknowledged.
ALARM COUNT	✔	✔	✔	✔	VT_I4	Number of alarm transitions before acknowledge.
AREA	✔	✔	✔	✔	VT_ARRAY | VT_BSTR	Array of areas
CV	✔	✔	✔	✔	VT_R8 VT_BOOL	Current Value (OPC Input 1 or 2).
DEADBAND	✔		✔	✔	VT_R8	Alarm detection Deadband.
DEFAULT DISPLAY	✔	✔	✔	✔	VT_BSTR	A text string, usually a file name, that when launched provides related information.
HELP TEXT	✔	✔	✔	✔	VT_BSTR	Help information
LIMIT VALUE EXCEEDED	✔		✔	✔	VT_R8	The Current Value at the time the limit was exceeded.
LOOP DESC	✔	✔	✔	✔	VT_BSTR	A description of the Source (tag).
NEXT_LIM	✔		✔		VT_R8	The value of the next limit.
NORMAL STATE		✔			VT_BOOL	Value of the normal state (TRUE or FALSE).
PREV LIM	✔		✔		VT_R8	Value of the previous limit reached.
RELATED VALUE 01-10	✔	✔	✔	✔		Associates up to 10 OPC tags or expressions with each alarm tag as “supplemental” information to the alarm.
SP	✔				VT_SP	Setpoint (OPC Input 2)

2.3 Creating an Alarm Filter

Once you have configured your subscriptions, the Multimedia Server will receive all alarms subscribed to in the configuration database. Alarm filters allow you to filter an alarm subset. You can make filters that only filter a specific alarm tag or filters that filter a group of alarms. The Multimedia Server uses alarm filters to specify which subset of alarms will be used to initiate a multimedia action.

The default configuration database provided in the installation contains many configured alarm filters. To view these filters, expand the Alarm Inputs folder in the tree control, and then expand the **Alarm Filters** folder. This shows all of the filters already defined in your system.

To set up an alarm filter:

1. Click the **Insert New Filter** button on the Configurator toolbar, or right-click on the **Alarm Filters** folder (found under the **Alarm Inputs** folder on the tree control) and select **New > Alarm Filter** from the pop-up menu, as shown in **Figure 2.16.**

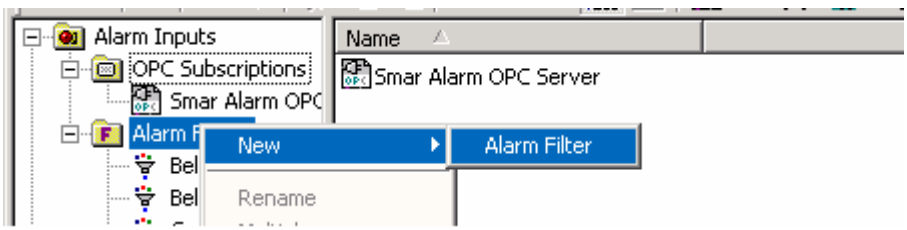


Figure 2.16. Creating a New Alarm Filter

2. Type in the new filter name, as shown in **Figure 2.17.**

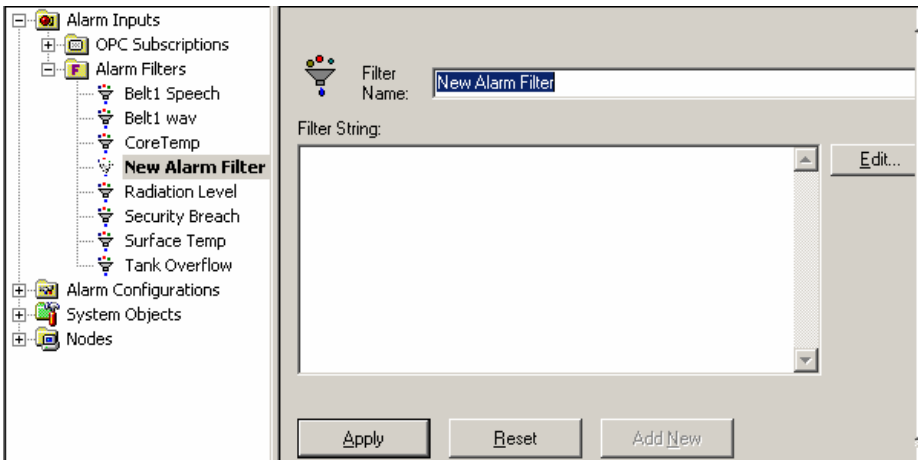


Figure 2.17. Naming the New Alarm Filter

3. Click the **Edit** button to open the **Edit Expression** dialog box (described in the section below). This is where you will configure your filter.
4. Click **Apply.**

Deleting a Filter

To delete an alarm filter, right-click the filter in the tree control and select **Delete** from the pop-up menu. Your system will ask if you really want to delete the filter. Click **Yes** to delete the filter.

Renaming a Filter

To rename a filter, right-click the filter in the tree view and select **Rename** from the pop-up menu. It is necessary to change the filter name if you are going to add more than one filter. Try to give the filter a name that describes what it does or the values it considers when filtering.

Note: Depending on the security level of the user, the user may or may not be able to create or activate filters during runtime mode.

2.3.1 Expression Editor

You can use the Edit Expression dialog box, shown in **Figure 2.18,** to set up your alarm filtering. The following options are available:

- Arithmetic
- Relational
- Logical
- Bitwise
- Functions
- Tags

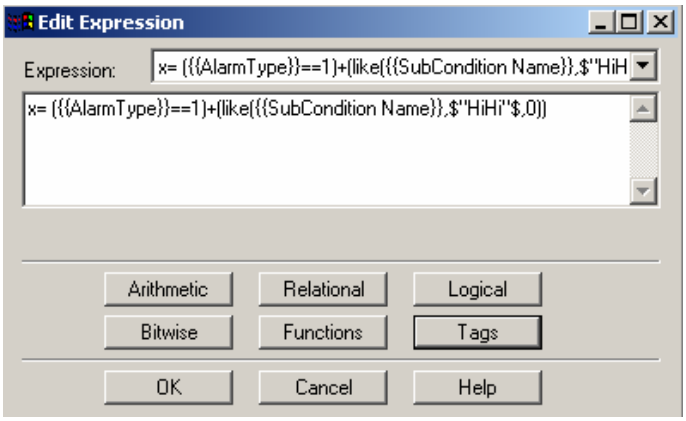


Figure 2.18. Edit Expression Dialog Box

Arithmetic

The symbols '+', '-', '*', '/' and '%' use the following format:

expression :: parameter **symbol** parameter

Where

Parameter	A local variable, an OPC tag, a constant, or another expression
Symbol	+ or - or * or / or %

Result

The expression results in a number of any type (float, long, etc.).

Examples

Symbol	Description	Example	Result
+	Addition	~~var1~~ + ~~var2~~	8+3 = 11
-	Subtraction	~~var1~~ - ~~var2~~	8-3 = 5
*	Multiplication	~~var1~~ * ~~var2~~	8*3 = 24
/	Division	~~var1~~ / ~~var2~~	8/3 = 2.66667
%	Calculates the remainder after division	~~var1~~ % ~~var2~~	8%3 = 2
(and)	Gives precedence to parts of the calculation	~~var1~~ / (~~var2~~ + ~~var3~~)	8/(3+2) = 1.6

Relational

The symbols '<', '>', '<=', '>=', '==' and '!=' use the following format:

expression :: parameter **symbol** parameter

Where

Parameter	A local variable, an OPC tag, a constant, or another expression
Symbol	< or > or <= or >= or == or !=

Result

The expression results in a Boolean value (0 or 1).

Examples

Symbol	Description	Example	Result
<	Less than	~~var1~~ < ~~var2~~	8<3 = 0
>	Greater than	~~var1~~ > ~~var2~~	8>3 = 1
<=	Less than or equal to	~~var1~~ <= ~~var2~~	8<=3 = 0
>=	Greater than or equal to	~~var1~~ >= ~~var2~~	8>=3 = 1
==	Equal to	~~var1~~ == ~~var2~~	8==3 = 0
!=	Not equal to	~~var1~~ != ~~var2~~	8!=3 = 1

Logical

The symbols '&&' and '||' use the following format:

expression :: parameter **symbol** parameter

The symbol '!' uses the following format:

expression :: **symbol** parameter

Where

Parameter	A local variable, an OPC tag, a constant, or another expression
Symbol	&& or || or !

Result

The expression results in a Boolean value (0 or 1).

Truth table

~~var1~~	0		not 0	
~~var2~~	0	not 0	0	not 0
~~var1~~ && ~~var2~~	0	0	0	1
~~var1~~ || ~~var2~~	0	1	1	1
!~~var1~~	1	1	0	0

Examples

Symbol	Description	Example	Result
&&	And	~~var1~~ && ~~var2~~	8 && 3 = 1
||	Or	~~var1~~ || ~~var2~~	8 || 3 = 1
!	Not	!~~var1~~	!8 = 0

Bitwise

The symbols '&', '|', and '^' of the bitwise group use the following format:

expression :: parameter **symbol** parameter

The symbol '~' of the logical group uses the following format:

expression :: **symbol** parameter

The symbols 'shl' and 'shr' of the bitwise group use the following format:

expression :: **symbol** (value, shift by)

Where

Parameter	A local variable, an OPC tag, a constant, or another expression
Symbol	&& or || or ^ or shl or shr or ~

Result

The expression results in a number when the parameters used contain numbers.

Bit Table

	Binary (Decimal)	Binary (Decimal)
~~var1~~	0000.0000.0000.1000 - (8)	0000.0000.0110.0000 - (96)
~~var2~~	0000.0000.0000.1010 - (10)	0000.0000.0000.1000 - (8)
~~var1~~ & ~~var2~~	0000.0000.0000.1000 - (8)	0000.0000.0000.0000 - (0)
~~var1~~ | ~~var2~~	0000.0000.0000.1010 - (10)	0000.0000.0110.1000 - (104)
~~var1~~ ^ ~~var2~~	0000.0000.0000.0010 - (2)	0000.0000.0110.1000 - (104)
shl (~~var1~~,3)	0000.0000.0100.0000 - (64)	0000.0011.0000.0000 - (768)
shr (~~var1~~,3)	0000.0000.0000.0001 - (1)	0000.0000.0000.1100 - (12)
~(~~var1~~)	1111.1111.1111.0111 - (-9)	1111.1100.1111.1111 - (-97)
bittest(~~var1~~,3)	0000.0000.0000.0001 - (1)	0000.0000.0000.0000 - (0)

Examples

Symbol	Description	Example	Result
&	Bit And	~~var1~~ & ~~var2~~	8 && 3 = 0
|	Bit Or	~~var1~~ | ~~var2~~	8 || 3 = 11
^	Bit eXclusive Or	~~var1~~ ^ ~~var2~~	8^3=11
shl	Bit shift left	shl(~~var1~~,3)	8<<3=64
shr	Bit shift right	shr(~~var1~~,3)	8>>3=1
~	Not (two's complement)	~(~~var1~~)	!8 = -9
bittest	Bit Test	bittest (5 , 0)	1

Note: The bittest function requires you to specify the position of the bit to be tested. You must indicate that it starts from 0. In other words, a bit position of "0" indicates the "less significant" bit.

Functions

The symbols 'sin', 'asin', 'cos', 'acos', 'tan', 'atan', 'log', 'ln', 'exp', 'sqrt', 'abs', 'ceil', and 'floor' use the following format:

expression :: **symbol** (parameter)

The symbols 'pow', 'min', and 'max' use the following format:

expression :: **symbol** (parameter,parameter)

The symbol 'if' uses the following format:

expression :: **symbol** (parameter,parameter,parameter)

Where

Parameter	A local variable, an OPC tag, a constant, or another expression
Symbol	sin, asin, cos, acos, tan, atan, log, ln, exp, sqrt, abs, ceil, floor, min, max, pow, or if

Result

The expression results in a number.

Examples

Symbol	Description	Example	Result
sin	sine of an angle in radians	sin(~~var1~~)	sin(0.785)=0.71
cos	cosine of an angle in radians	cos(~~var1~~)	cos(0.785)=0.71
tan	tangent of an angle in radians	tan(~~var1~~)	tan(0.785)=1.0
asin	arc sine returns an angle in radians	asin(~~var1~~)	asin(0.5)=0.52
acos	arc cosine returns an angle in radians	acos(~~var1~~)	acos(0.5)=1.05
atan	arc tangent returns an angle in radians	atan(~~var1~~)	atan(1)=0.785
sqrt	Returns the square root	sqrt(~~var1~~)	sqrt(100)=10
pow	Returns value 1 raised to the power value 2	pow(~~var1~~,~~var2~~)	pow(100,1.5)=1000
log	10 based logarithm	log(~~var1~~)	log(100)=2
ln	*e* based logarithm	ln(~~var1~~)	ln(7.389)=2
exp	Exponential	exp(~~var1~~)	exp(2)=7.389
abs	Absolute value	abs(~~var1~~)	abs(-1)=1
ceil	Integer ceiling	ceil(~~var1~~)	ceil(7.39)=8
floor	Integer floor	floor(~~var1~~)	floor(7.39)=7
min	Lowest value of two	min(~~var1~~,~~var2~~)	min(10,5)=5
max	Highest value of two	max(~~var1~~,~~var2~~)	min(10,5)=10
if	Conditional statement	if(~~var1~~<~~var2~~, ~~var1~~,~~var2~~)	if(5<8,5,8)=5
like	Wildcard string compare	Like(string, pattern, casesensitive')	
quality	Quality of tag or expression	See below.	See below.
tostring	Type conversion	See below.	See below.
0x	Hexadecimal constant	x=0x11	17
0t	Octal constant	x=0t11	9
0b	Binary constant	x=0b11	3

Note: For the like operator: "string" equals the string to search in; "pattern" equals the string to search for (can include wildcards); nonzero for case-sensitive search; zero for case-insensitive search. String syntax is $"string"$.

You can use these special characters in pattern matches in string:

- ? Any single character.
- Zero or more characters.
- # Any single digit (0-9).
- [charlist] Any single character in charlist.
- [!charlist] Any single character not in charlist.

Quality

The **quality** option on the **Functions** menu of the **Expression Editor** is used to evaluate the quality of an OPC tag or an expression.

The following general syntax is used for quality expressions:

x=quality(expression)

Note: The "(expression)" can also be a simple expression composed of a single tag.

The **quality** function returns the OPC quality of the string between parentheses as one of the following results:

- 192: quality is GOOD
- 64: quality UNCERTAIN
- 0: quality BAD

Note: The OPC Foundation establishes the value ranges for quality. There are actually varying degrees of quality:

- GOOD: 192-252
- UNCERTAIN: 64-191
- BAD: 0-63

For more information, refer to the *OPC Data Access Custom Interface Standard* available for download at the OPC Foundation's Web site, www.opcfoundation.org/.

Example Quality Expression

Expression	Result
x=quality({{SMAR.Simulator.1\SimulatePLC.PumpStatus}})	192 (Quality GOOD)

The quality of an expression is determined through the evaluation of each single tag in the expression. Thus, if you have multiple tags in an expression (and each tag has a different quality), the result of the expression (i.e. 192 [GOOD], 64 [BAD], or 0 [UNCERTAIN]) corresponds to the quality of the tag with the lowest quality. If an expression contains a conditional statement (e.g. if, then, or else), then the result of the expression is affected only by the quality of the branch being executed.

Consider the following sample expression:

x= if (quality({{Tag1}}) == 192, {{Tag1}}, {{Tag2}})

This expression can be read as follows:

"If the quality of Tag1 is GOOD (i.e. 192), then the expression result (x) is the value of Tag1. In all other cases (i.e. the quality of Tag1 is UNCERTAIN or BAD), the expression result (x) is the value of Tag2."

We can calculate the results for this expression using different qualities for Tag1 and Tag2, as shown in the table below.

Case	Tag1 quality	Tag2 quality	Result	Result quality
1	GOOD	GOOD	Tag1	192 (GOOD)
2	GOOD	UNCERTAIN	Tag1	192 (GOOD)
3	GOOD	BAD	Tag1	192 (GOOD)
4	UNCERTAIN	GOOD	Tag2	192 (GOOD)
5	UNCERTAIN	UNCERTAIN	Tag2	64 (UNCERTAIN)
6	UNCERTAIN	BAD	Tag2	0 (BAD)
7	BAD	GOOD	Tag2	192 (GOOD)
8	BAD	UNCERTAIN	Tag2	64 (UNCERTAIN)
9	BAD	BAD	Tag2	0 (BAD)

In cases 1-3 above, the quality of Tag1 is GOOD, and therefore the result of the expression is GOOD. Thus, the result of the expression is not affected by the quality of Tag2 (the “else” branch of the expression), which is ignored.

In cases 4-6, the quality of Tag1 is UNCERTAIN, and therefore the result of the expression is the quality of Tag2.

In cases 7-9, the quality of Tag1 is BAD, and therefore the result of the expression is the quality of Tag2.

Note: The “quality()” function returns a value that represents the quality of the expression within the parentheses but is always GOOD_QUALITY. For example, if Tag1 is BAD_QUALITY then the expression “x=quality({{Tag1}})" will return 0 with GOOD_QUALITY.

The result of an expression is the minimum quality of the evaluated tag in the expression and is affected only by the quality of the conditional (if, then, or else) branch that is executed.

Consider the following sample expression:

x= if ({{TAG_01}}>0,{{TAG_02}},{{TAG_03}})

This expression can be read as follows:

"If the value of TAG_01 is greater than 0, then the expression result (x) is TAG_02. If the value of TAG_01 is less than or equal to 0, then the expression result (x) is TAG_03."

Let's assume that the following values and qualities for these tags:

TAG_01=5 with quality GOOD

TAG_02=6 with quality UNCERTAIN

TAG_03=7 with quality BAD

Because the value of TAG_01 is 5 (greater than 0), the expression result is TAG_02. Thus, the final expression result is 6, and the final expression quality is UNCERTAIN.

Type Conversion

The **tostring** option on the **Functions** menu of the **Expression Editor** takes the value of whatever item is in parentheses and converts it into a string as follows:

The value is +(value)+unit

It can be used to convert from number to string, and it can be very useful for string concatenation.

The proper syntax for the **tostring** option is:

x=$"The value is "$ + tostring(value) + $" unit"$

Note: In the expression above, the word "unit" is placeholder text for a user-specified unit of measurement or variable (e.g. Watt, inches, meters, etc.).

Example Expressions Type Conversion

Expression	Result
x=$"The value is "$ + tostring({{gfwsim.ramp.float}}) + $" Watt"$	“The value is 543.2345152 Watt”

Constants

The **Functions** menu of the **Expression Editor** supports constant values, including hexadecimal, octal, and binary formats.

Example Expressions Using Constants

Expression	Result
x=0x11	17
x=0t11	9
x=0b11	3

The **Expression Editor** conveniently inserts the 0x and 0t and 0b prefixes for you so do not have to recall them.

Interpreting and Translating Constants

The examples below show how values are calculated for each type of constant.

- **Hexadecimal:** 0x20A = 2 * (16^2) + 0 * (16^1) + 10 * (16^0) = 2*256 + 0*16 + 10 * 1 = 512 + 0 + 10 = 522
- **Octal:** 0t36= 3 * (7^1) + 6 *(7^0) = 3* 7 + 6* 1= 21 + 6 = 27
- **Binary:** 0b110 = 1 * (2^2) + 1 * (2^1) + 0 * (2^ 0) = 1 * 4 + 1 * 2 + 0 * 1 = 4+2+0 = 6

Tags

The menu options available under the **Tags** button of the Expression Editor are shown in **Figure 2.19.** The **Expression Editor** dialog box can also be used to create and edit alarm filters. The Expression Editor provides a **Filter Wizard** and an **Alarm Tag** list to help you create simple alarm filters. If you want to customize your alarm filters, you can use the other functions in the Expression Editor to set up your alarm filters manually.

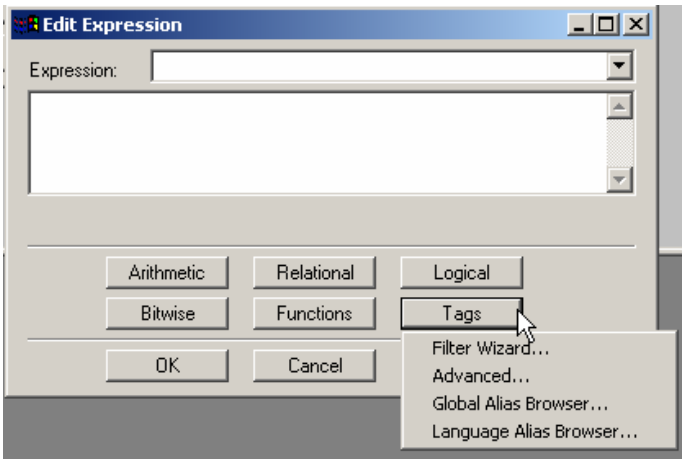


Figure 2.19. Creating Alarm Filters Using the Expression Editor

Filter Wizard

The **Filter Wizard,** shown in **Figure 2.20,** allows you to choose from the following to items enter in your expression. Select one or more items, and then click **OK.** The filter string is automatically inserted into the **Edit Expression** dialog box.

- **Alarm Types:** Alarm, Acknowledgement, Unacknowledgement, Tracking, and Operator
- **Sub Conditions:** LoLo, Lo, Hi, HiHi, Rate of Change, and Digital

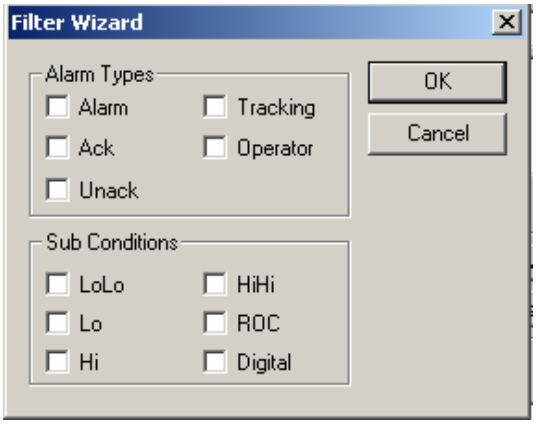


Figure 2.20. Filter Wizard

Selecting Alarm Attributes

Clicking **Advanced** (see Figure 2.19) opens the **Alarm Tag** list, shown in **Figure 2.21,** which allows you to choose alarm attributes for your alarm filter. Select the attribute that you want to include in the filter expression and click **OK.**

Figure 2.21. Alarm Tag List

There are two additional attributes available for use in filtering: **Alarm Type** and **Current Time.** The Alarm Type attribute allows you to filter alarms according to ALARM 1, ACK 2, UNACK 3, OPER 4, TRACK 5 or NORM 6. For example, you can set up a filter with the condition:

X = {{AlarmType}}

If the **Alarm Type** is true, then the alarms are displayed. If it is false, then they are not displayed.

The **Current Time** attribute allows you to filter according to the current time. Only alarms occurring around the current time will be displayed.

Example Alarm Filters

Expression	Result
X = {{Severity}} > 500.	Only alarm messages with a severity greater than 500 will be visible.
X = Like({{Source}}, $"Tag"$,0)	Only messages with the tag in the source name will be displayed.
X = 1.	Filter displays all messages.
X = 0.	Filter does not display any messages.

All filters resolve to TRUE or FALSE. All nonzero values resolve to TRUE.

Global Aliases

For global aliases within the expression, use the following syntax:

<#global_alias_name**#>**

Example:

x=<#RoomTemperature#>

Selecting **Global Alias Browser** opens the Global Alias Browser, as shown in **Figure 2.22.** Select a global alias from the Global Alias Browser, which includes all global aliases in the global alias database. This eliminates the need to manually type in the alias name. All global aliases that are configured in the Global Alias Engine Configurator are conveniently available to choose from inside the browser. The tree control of the Global Alias

Engine Configurator is mimicked in the tree control of the Global Alias Browser. Select a global alias by double-clicking the alias name (e.g. "Floor" in the figure below). The alias name appears at the top of the browser, which automatically adds the <# and #> delimiters to the alias name. Click the **OK** button.

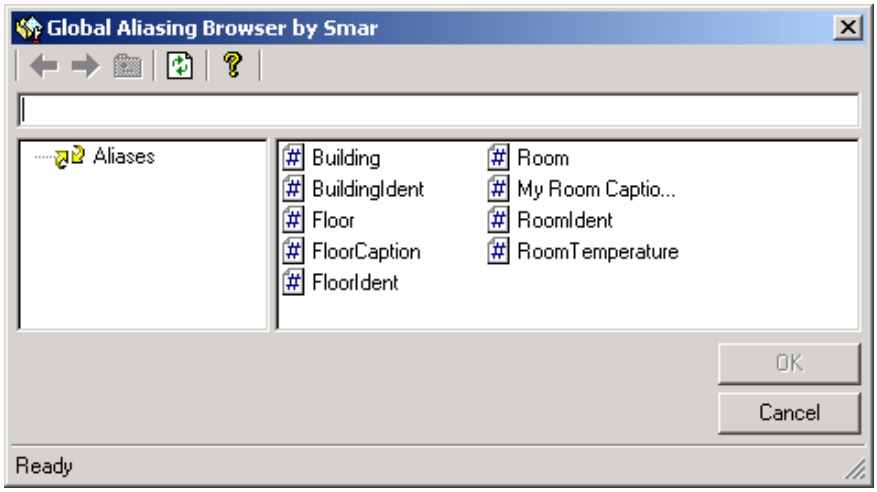


Figure 2.22. Selecting an Alias From the Global Alias Browser

Language Aliases

For language aliases within the expression, use the following syntax:

/+language_alias_name**+/**

Example:

x=/+WaterSystem+/

Selecting **Language Alias Browser** from the pop-up menu opens the Language Alias Browser, as shown in **Figure 2.23.** The browser includes all languages aliases in the language database. All language aliases that are configured in the Language Configurator are conveniently available to choose from inside the browser. The tree control of the Language Configurator is mimicked in the tree control of the Language Alias Browser. Select a language alias by double-clicking the alias name. The alias name appears at the top of the browser, which automatically adds the /+ and +/ delimiters to the alias name. Click the **OK** button.

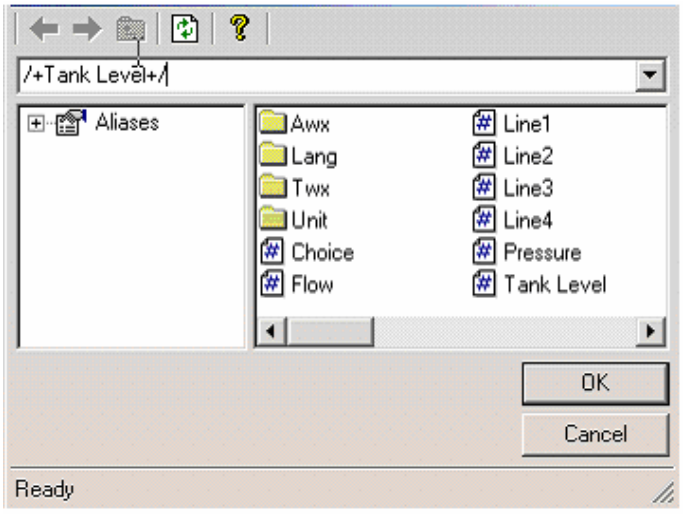


Figure 2.23. Selecting an Alias From the Language Alias Browser

2.4 Configuring a Multimedia Agent

You can configure any of the following multimedia agents to react when a predefined condition occurs within any alarm or events server:

- **E-mail:** Sends an e-mail message.
- **Sound / Text-to-Speech:** Plays prerecorded sounds and/or speech from text locally or remotely over a network.
- **Marquee:** Creates a marquee window displaying a message locally or remotely over a network.
- **Pager (SMS/GSM/TAP):** Sends a message to a pager.
- **Telephony:** The Call-out Agent calls a defined number and gives a message with options to respond. The Call-in Agent enables callers to dial in by phone to get alarm information and issue commands.
- **Fax:** Sends a message to a fax machine.
- **Instant Messaging:** Sends a message to any computer using Instant Messaging.
- **Popup:** Opens a program or Web site giving alarm messages.
- **Video:** Plays a video; can be a prerecorded video or a video captured at the moment of the alarm.

To configure a multimedia agent, do the following:

1. Right-click on the type of agent you wish to configure. Then select **New** and then the type of agent you wish to configure. The agent folders can be found in the **Multimedia Agents** folder, which is in the **Alarm Configurations** folder on the tree control, as shown in **Figure 2.24.**

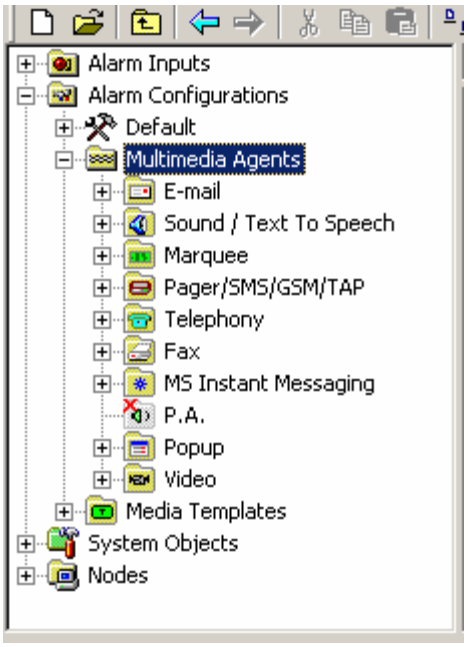


Figure 2.24. Multimedia Agents Tree Control

2. Depending on which type of agent you choose to configure, an appropriate dialog box will appear with all available options displayed. To see a description of each configuration field for a particular agent, click on that agent from the list above.
3. After entering all appropriate information, click **Apply** to save the agent information.

Note: For details on multimedia agent configuration, please see **Chapter 4.**

Note: You must enter an **Acknowledge Code** in the appropriate field if you wish for your user to be able to acknowledge or confirm receipt of an alarm. This is important if you will be using an escalating list of alarm actions and want the list to discontinue once someone has recognized an alarm has occurred. Note that the Sound / Text-to-Speech, Fax, Popup, and Video agents are used only for displaying messages and do not have an acknowledge option associated with them.

2.5 Creating an Alarm Configuration

The **alarm configuration** is where you specify which OPC subscription to be used and where you create action sets to be followed. Each new database you create will have a default alarm configuration. This is the alarm configuration you should plan to use if you are just creating one alarm configuration for your computer to follow. If you create a new alarm configuration with a name other than "Default," you will also need to create a new node configuration and link it to your alarm configuration.

To add the OPC subscription to be used in your configuration, do the following:

1. Right-click the **Alarm Configurations** folder and select **New > Alarm Configuration,** as shown in **Figure 2.25.**

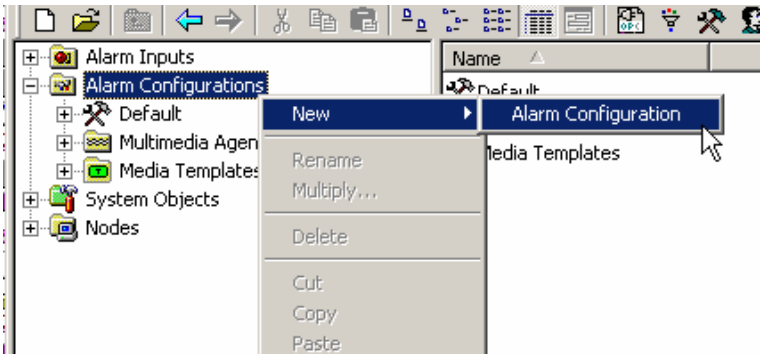


Figure 2.25. Adding a New Alarm Configuration

2. Select the OPC subscription you wish to use from the drop-down list, as shown in **Figure 2.26.**

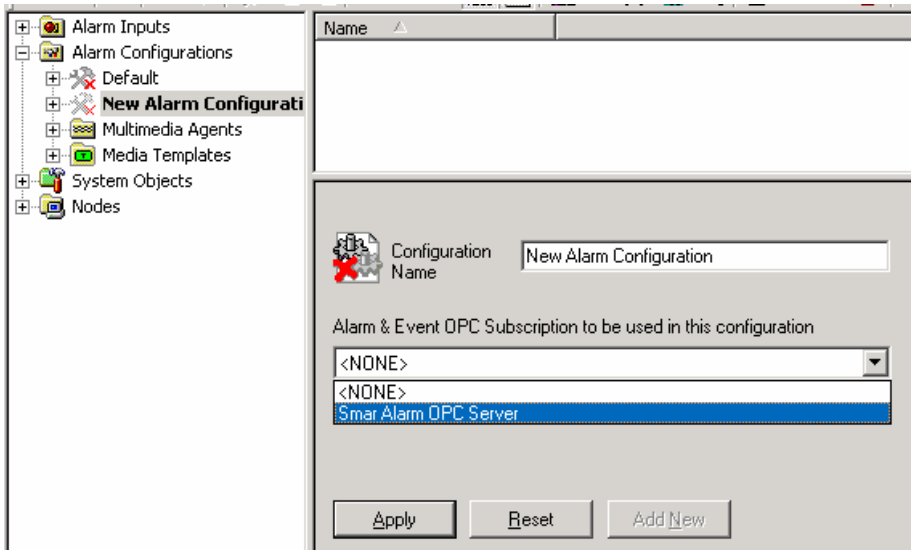


Figure 2.26. Choosing an OPC Subscription

3. Click **Apply.**

2.6 Creating an Alarm Action Set

An **Alarm Action Set** is a set of actions that the Multimedia Server will take whenever an alarm from that subscription occurs. For example, one action set could not only page the security guard, but it could also send an e-mail message to the technician on duty, announce the message over a phone, and fax the alarm to a remote center. You can create more than one action set under each alarm configuration. Each action set you create is based on a filter. Within each action set, you can define more than one procedure for that action set to follow.

To create an action set:

1. Right-click on **Default** and select **New > Alarm Action Set** from the pop-up menu, as shown in **Figure 2.27.** The **Default** alarm configuration object can be found in the **Alarm Configurations** folder on the tree control.

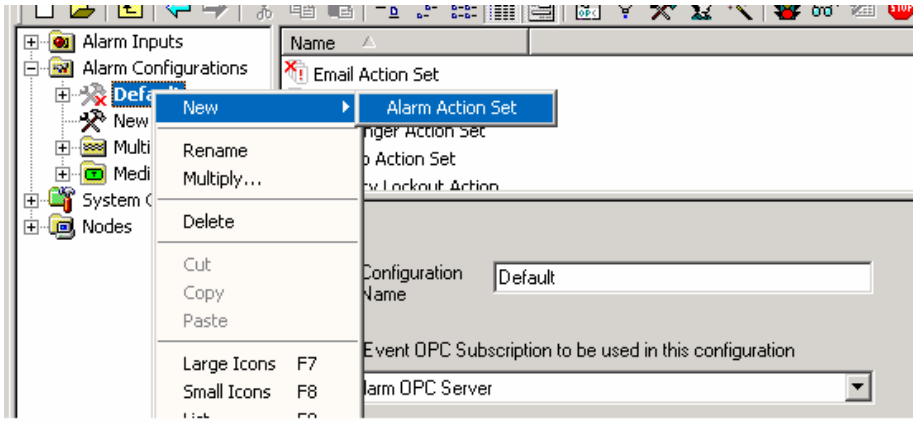


Figure 2.27. Creating a New Alarm Action Set

2. Enter a name for this action set, as shown in **Figure 2.28.**

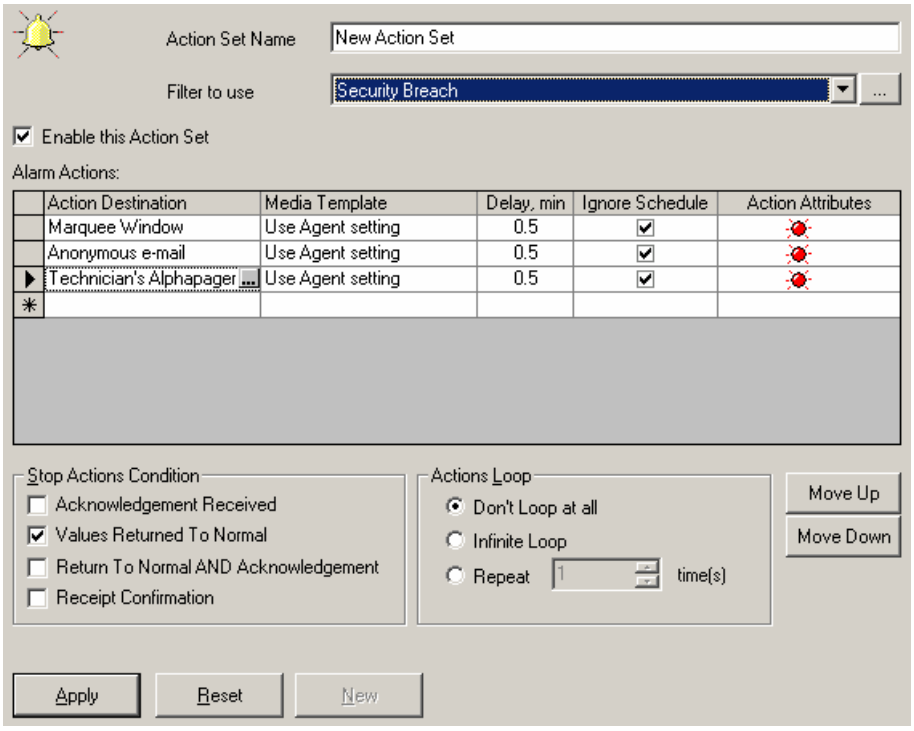


Figure 2.28. Setting the Properties for the New Alarm Action Set

3. Select a filter from the **Filter to Use** drop-down list.

4. In the **Alarm Actions** field, select what you want to occur from the list under **Action Destination.** Clicking the **...** button in each **Action Destination** row opens the **Select Action Destination** dialog box, as shown in **Figure 2.29.** Action destinations can be configured multimedia agents (e.g. Marquee Window) or roles (e.g. General Manager). Select an action destination from the tree control on the left and then click the **Set selected item as Action Destination** button, as shown in Figure 2.29.

   In the **Action Destination** field, you can also select <**NO ACTION>** by clicking the **Set as 'No Action'** button, as shown in Figure 2.29. When this option is selected, the Multimedia Server will wait a specified amount of time (the delay time) before executing the next action.

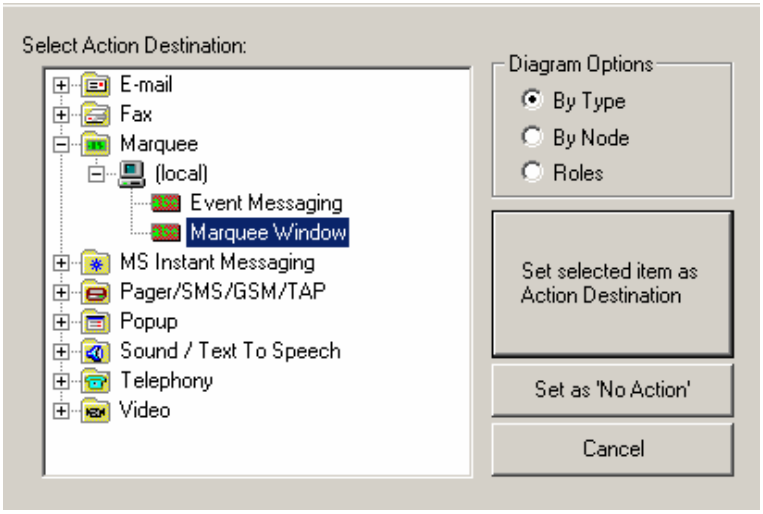


Figure 2.29. Selecting an Action Destination

5. Select from the **Media Template** list *only* if you wish to override the previously defined template under the multimedia agent.

6. If you are listing more than one **Alarm Action** to follow, you have the option of having them all occur at once or delaying the next action to take place. If you want the next action to take place at the same time as the previous one, leave the **Delay** set to 0 minutes. If you want the next action to take place after a certain number of minutes (if the **Stop Action Condition** has not yet been met) enter the number of minutes under **Delay, min.**

7. Check the **Ignore Schedule** box only if you wish to override any predefined schedules. (See **Chapter 6** for information about schedules.)

8. To set the **Action Attributes,** click the **...** button in each row. Select when to initiate each action: in the state of an **Alarm,** a **Return to Normal,** or an **Acknowledgement,** as shown in **Figure 2.30.**

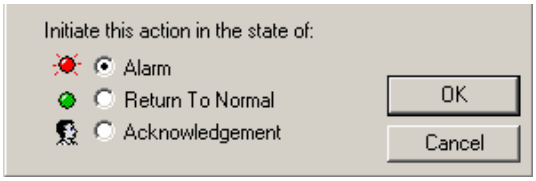
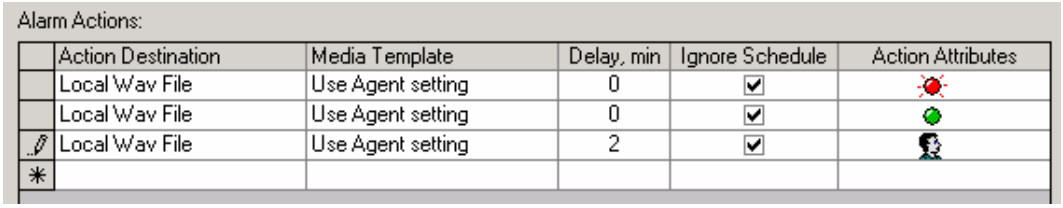


Figure 2.30. Selecting an Alarm Action Attribute

Note: The action attribute for the first alarm action in the action set should be set to **"Alarm."** Use of **Return to Normal** or **Acknowledgement** action attribute settings requires an associated **Alarm** action attribute. The **Alarm** action attribute must be listed in the action set before **Return to Normal** or **Acknowledgement.** Only action destinations that receive the alarm message will receive the return to normal or acknowledgement messages. An example of this is shown in **Figure 2.31.**


Alarm Actions:

	Action Destination	Media Template	Delay, min	Ignore Schedule	Action Attributes
	Local Wav File	Use Agent setting	0	☑	
	Local Wav File	Use Agent setting	0	☑	
	Local Wav File	Use Agent setting	2	☑	
*					

Figure 2.31. Alarm Action Attribute Listed in Action Set

9. The **Stop Actions Condition** field is where you define what will stop the list of **Alarm Actions** from escalating to the next action. If you do not check any of the options, the complete list of actions will occur regardless of whether any alarms were acknowledged or returned to normal.

- If you check **Acknowledgement Received,** the list of actions will continue until one of the actions is acknowledged. The acknowledgement can be verified by either a multimedia agent or the alarm viewer.
- If you check **Values Returned To Normal,** the list of actions will continue until the values return to normal.
- If you check **Return to Normal AND Acknowledgement,** the list of actions will continue until one of the actions is acknowledged *and* the values return to normal.
- Checking **Receipt Confirmation** tells the Multimedia Server that, yes, the alarm has been responded to, but does not mark the alarm as acknowledged. Therefore, the alarm will not be shown as acknowledged in the alarm viewer.
- If more than one stop actions condition is checked, the complete list of actions will occur until all conditions have been met. For example, if both **Values Returned to Normal** and **Receipt Confirmation** are checked, the actions will occur until both the values have returned to normal and a confirmation has been sent through the multimedia agent.

  Note: The use of stop actions conditions is not required. However, if you do not select a stop actions condition, the infinite actions loop is disabled.

10. Use the **Actions Loop** field if you wish to return to the first action destination and repeat all alarm actions until the specified stop actions condition has been met. If you want the loop to be repeated continuously, select **Infinite Loop.** If you want the loop to be repeated only a certain number of times, select **Repeat** and then enter the number of times you want the actions loop to be repeated. Alternatively, if you do not want an actions loop, select **Don't Loop at All.**

Note: Be careful when enabling action looping. The **Actions Loop** is performed after the delay of the last action in the action set. It is possible for agents to queue hundreds of action requests. This occurs if the agent takes more time to process action requests than it takes to repeat the action loop.

11. Check **Enable This Action Set** for your alarm actions to take effect, and then click **Apply.**

To delete an alarm action entry, click on the gray cell to the left of that entry to select the entire row and press the **Delete** key.

Note: The **Stop Actions Condition** options apply to the escalating list of actions to be taken and not to one individual alarm action. However, if you only have one action and would like it to continue happening until it is acknowledged or until the values return to normal, check **Enable Alarm Actions Loop** and choose the **Stop Actions Condition** you wish to use to stop the action.

Note: You can also assign a role as an action destination. For information about configuring roles, please see **Chapter 6.**

2.7 Activating the Database

Once your alarm configuration is complete, you need to make sure that it is the active database. The database that is currently active is the one that the OPC server will use. To make the current database active, select **Make Active…** from the **File** menu of the Configurator, as shown in **Figure 2.32.** If the **Make Active…** selection is grayed out, then the current database is already the active database.

A dialog box will appear showing both the current active database and database that is currently being edited. To set the edited database as the active database, click the **Yes** button.

If you make changes to the database while the server is running, you can update the server with your changes while it is running. To do this, click the **Update Server Data** button on the toolbar.

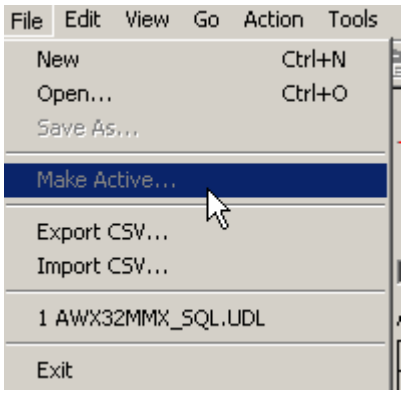


Figure 2.32. Activating the Database

2.8 Starting the Multimedia Server

In order for the Multimedia Server to use the information in the configuration database, the server must be placed into "runtime" mode. To start/stop the server, click the stoplight button on the toolbar, or select **Start Multimedia Server** from the **Action** menu, as shown in **Figure 2.33.**

If you make changes to the database while the server is running, you can update the server with your changes while it is running. To do this, click the **Update Server Data** button on the toolbar.

Note: You can also start/stop the Multimedia using the ProcViewTray tool tray. For more information, please see the ProcViewTray Help documentation.

Figure 2.33. Starting the Multimedia Server

Chapter 3

Multimedia Configuration Wizard

3.1 Using the Multimedia Configuration Wizard

The **Multimedia Configuration Wizard** is a key feature of AlarmWorX Multimedia that helps you create and configure alarms. The Multimedia Configuration Wizard provides a simple, user-friendly walk-through that guides you through the creation and configuration of alarms. Using the Multimedia Configuration Wizard simplifies the alarm configuration process down to the following steps:

Step 1. Use the Multimedia Configuration Wizard to configure an alarm.

Step 2. Make the database active.

Step 3: Start the Multimedia Server.

Multimedia Assistant

For additional help on configuring alarms, you can consult the **Multimedia Assistant,** shown in **Figure 3.1,** at any time. To launch the Multimedia Assistant, select **Multimedia Assistant** from the **Help** menu. Follow the instructions provided by the Multimedia Assistant.

Figure 3.1. Multimedia Assistant

3.1.1 Starting the Multimedia Configuration Wizard

The Multimedia Configuration Wizard consists of a series of dialog boxes that guide you through alarm configuration. To start the Multimedia Configuration Wizard, click the **Multimedia Configuration Wizard** button on the Configurator toolbar, or select **Multimedia Configuration Wizard** from the **Tools** menu. Follow the instructions in the dialog boxes.

1. The first step in the Multimedia Configuration Wizard is to enter a name for your alarm configuration, as shown in **Figure 3.2.** You can also select an existing configuration from the drop-down list. Click **Next** to continue to Step 2.

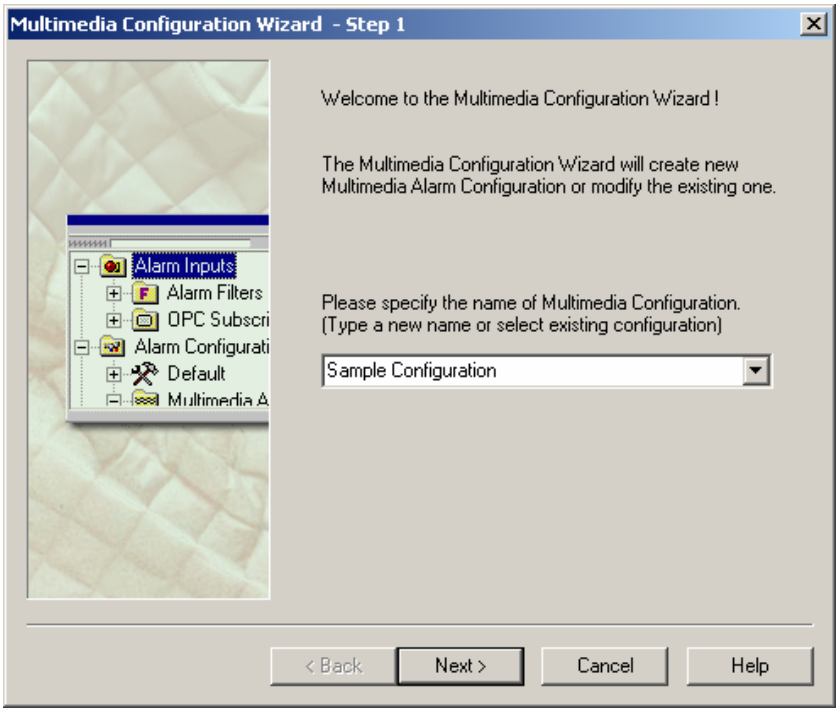


Figure 3.2. Step 1: Entering a Name for the Configuration

2. In Step 2, you must select an OPC subscription to use with the configuration. You have the option of creating a new OPC subscription or selecting an existing one. An **OPC subscription** is a connection to a local or remote alarm OPC server. **Create New OPC Subscription** is selected by default, as shown in **Figure 3.3.** Click **Next** to continue to Step 3.

Note: If you wish to use an existing OPC subscription, select **Use Existing OPC Subscription** and click **Next.** The Multimedia Configuration Wizard will skip to Step 4.

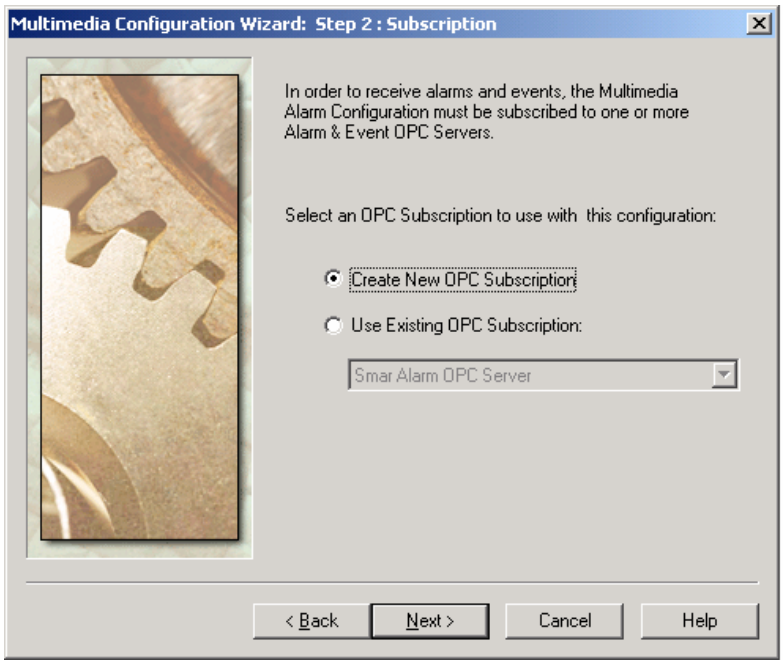


Figure 3.3. Step 2: Selecting an OPC Subscription

3. Enter a name for your new OPC subscription, and click the **Subscribe Now!** button, shown in **Figure 3.4.** Clicking this button will launch the **Subscription Properties** dialog box, which allows you to add and configure one or more OPC Alarm and Event server connections. If you have successfully connected, the traffic light icon on the dialog box will turn green. Once you have a green light, click **Next** to continue to Step 4.

Note: Please refer to **Chapter 2** for more information on alarm subscription properties.

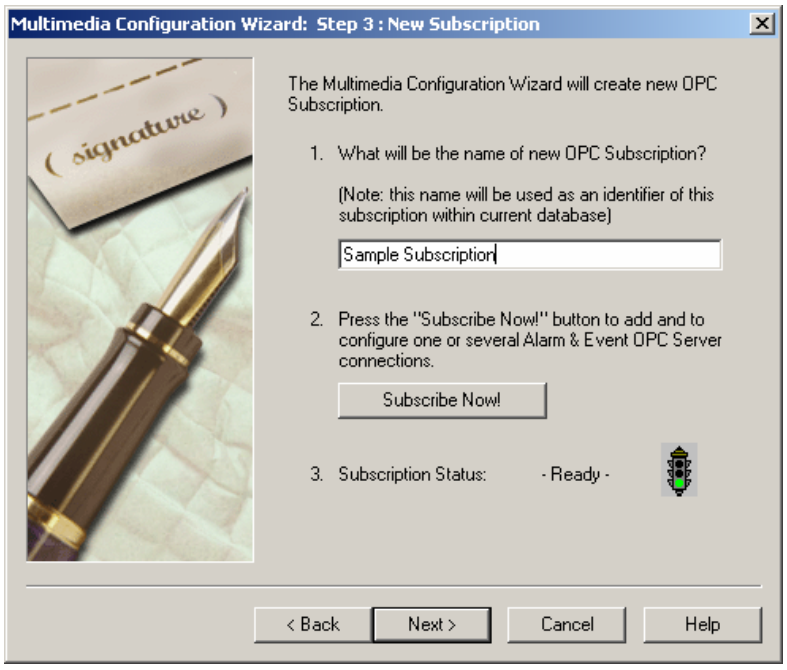


Figure 3.4. Step 3: Creating a New OPC Subscription

4. You are now ready to configure an alarm action set. An **Action Set** is a collection of tasks to be delegated to various multimedia agents (marquee, sound, e-mail, etc.). Give the action set a name and supply information on when the action set is to stop, as shown in **Figure 3.5.** If you choose to enable the alarm actions loop, then the multimedia actions will return to the first action destination and repeat all alarm actions until the specified stop actions condition has been met.

Note: For more information on creating an alarm action set and choosing stop actions conditions, please refer to **Chapter 2.**

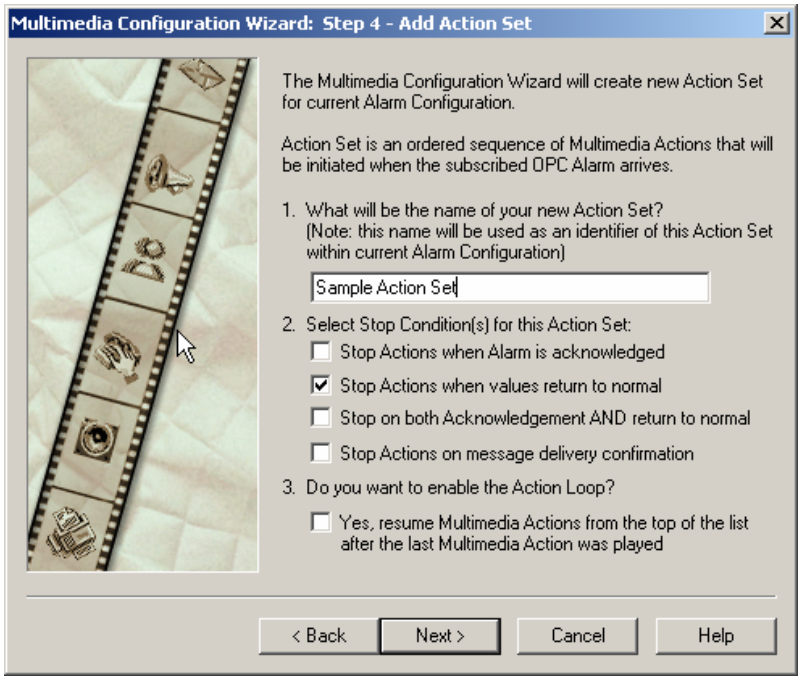


Figure 3.5. Step 4: Configuring an Alarm Action Set

5. The next step is to create or specify a filter for your action set, as shown in **Figure 3.6.** If you wish to use an existing filter, simply select the appropriate option button and pick from the list of existing filters provided. To create a new filter, select the first option and click **Next.** If you have chosen an existing filter, or if you have chosen not to use a filter at all, the Wizard will skip to Step 7.

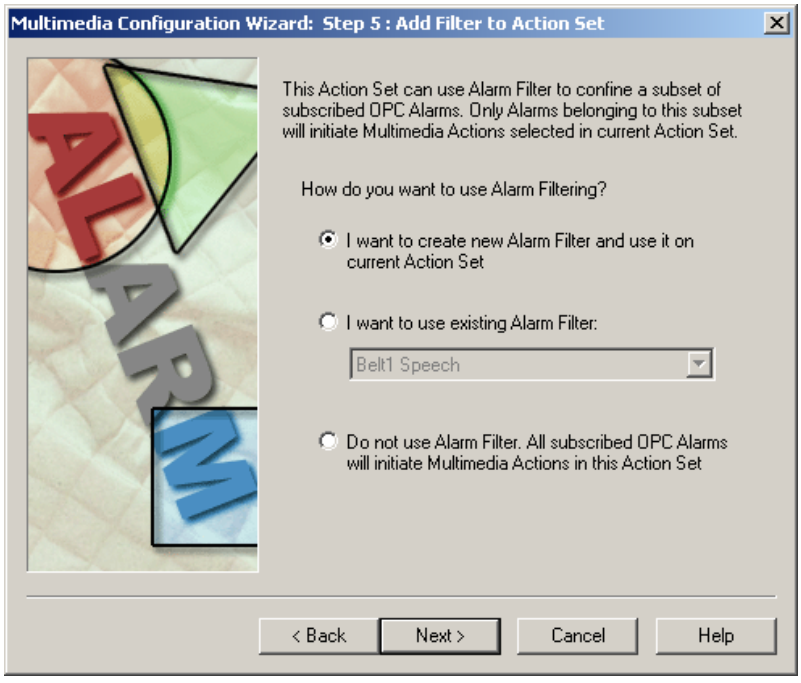


Figure 3.6. Step 5: Adding a Filter to an Alarm Action Set

6. If you chose in Step 5 to create a new filter, you will be asked in Step 6 to enter a name and an expression for your filter, as shown in **Figure 3.7.** Click the **Edit Filter Expression…** button to launch the Expression Editor, which enables you to set up your alarm filters.

   Note: For help on writing expressions, please refer to **Chapter 2.**

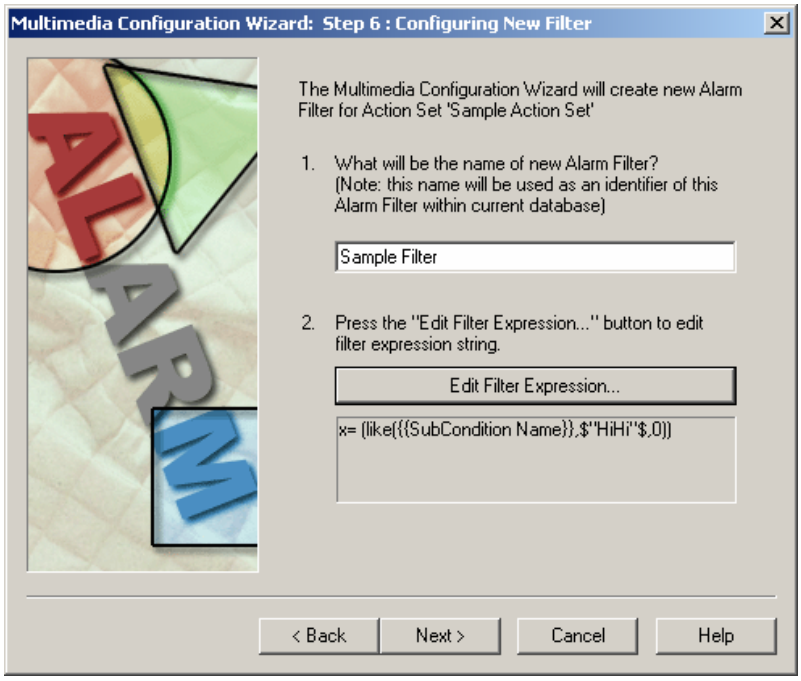


Figure 3.7. Step 6: Configuring the New Alarm Filter

7. In Step 7, you have the option of selecting a multimedia agent to respond to your action set, as shown in **Figure 3.8.** The corresponding multimedia agent will be configured for the action that you selected.

   Note: The **Sending Alarm Over the Phone Line** option in Figure 3.8 applies only to the Call-out Agent. The Configuration Wizard does not support the Call-in Agent.

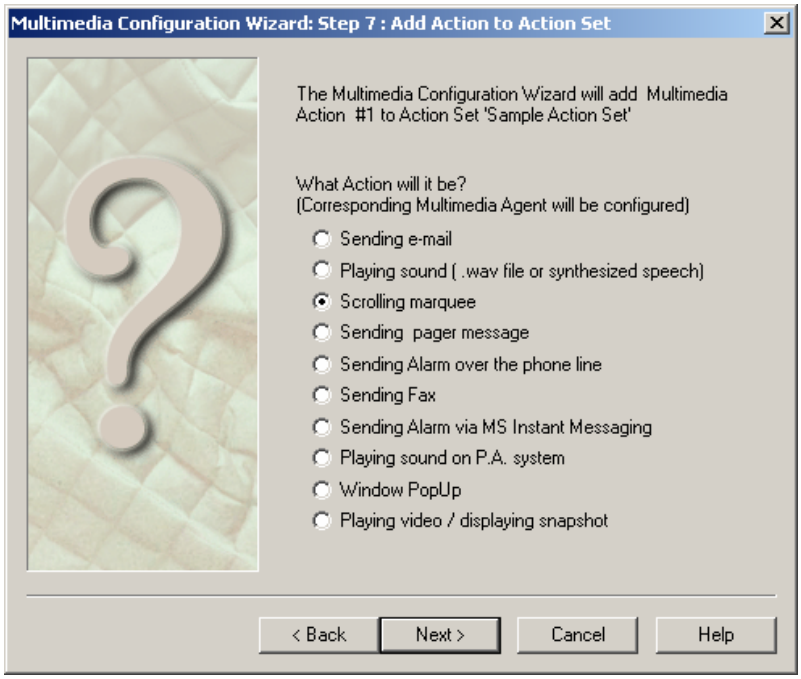


Figure 3.8. Step 7: Adding a Multimedia Agent to the Alarm Action Set

8. Once you have specified a multimedia agent, you will be prompted to create a new configuration or specify an existing configuration for that agent, as shown in **Figure 3.9.** To create a new agent configuration, select the

appropriate option and click **Next.** If you choose to specify an existing agent configuration, select it from the provided drop-down list, and then click **Next.**

Note: If you choose to use an existing agent configuration, the wizard will skip to Step 10.

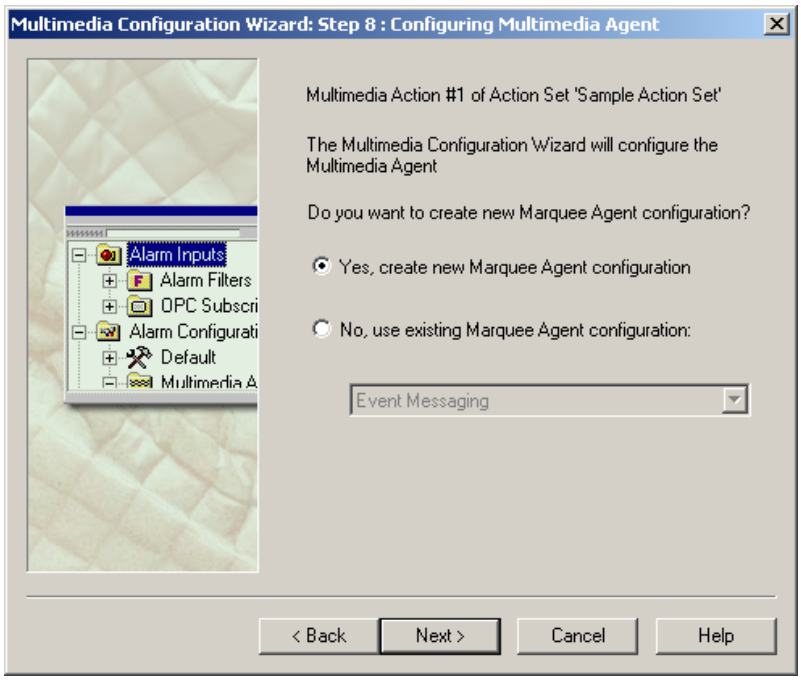


Figure 3.9. Step 8: Configuring a Multimedia Agent

9. In Step 9, enter a name for the multimedia agent configuration, as shown in **Figure 3.10.** Also choose a node on which to run the agent. You can browse for the node by clicking the **...** button to the right of the node name field. If you leave the node name field blank, the local node name will be assumed. The remaining items to be filled in vary from one agent to the next. The example in Figure 3.10 shows a sample configuration for the Marquee Agent. This configuration asks the marquee to repeat the alarm message once—play it twice (a repeat of zero means play once)—and accept any acknowledgement where a user entered "12345" as an acknowledgement code. If this were the configuration for the E-mail Agent, for example, there would be places to fill in the 'To:', 'CC:' and 'Subject' fields. Different agents call for different configurations.

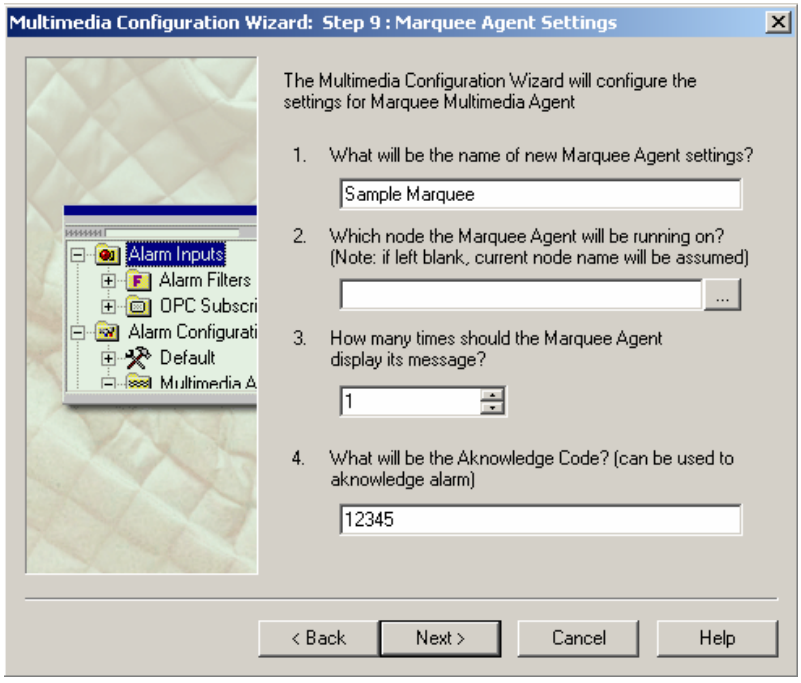


Figure 3.10. Step 9: Configuring the Settings for the Multimedia Agent

10. The next step is to create or specify a media template for the multimedia agent, as shown in **Figure 3.11.** A **media template** is simply a way of specifying exactly what information is to be sent to the agent. To create a new template, select the appropriate option and click **Next.** To use an existing template, select an existing template from the provided drop-down list.

Note: If you use an existing template, the Wizard will skip to Step 12.

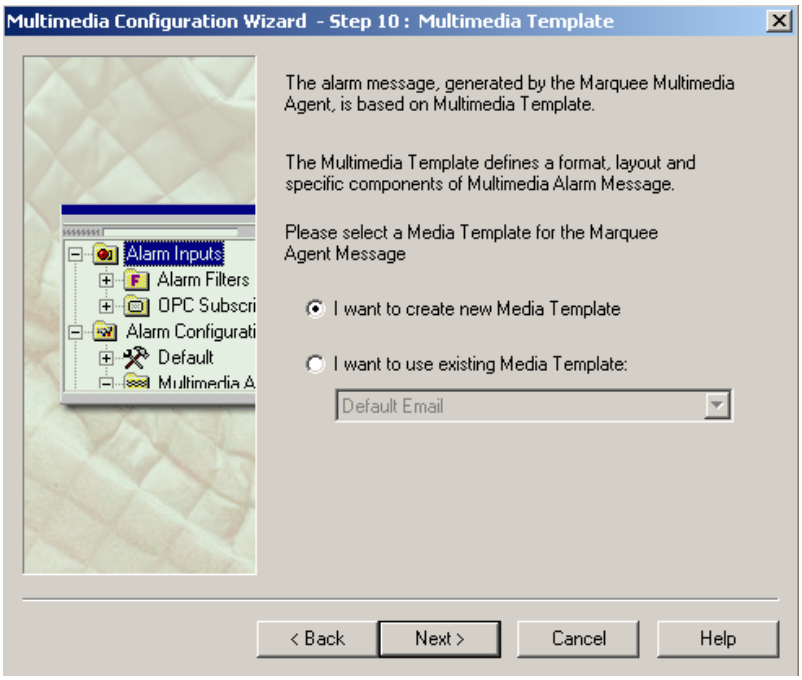


Figure 3.11. Step 10: Selecting a Media Template for the Multimedia Agent

11. In Step 11, enter a name for the template and select the alarm components to be delivered to the multimedia agent, as shown in **Figure 3.12.** For some agents, additional options will be available to you.

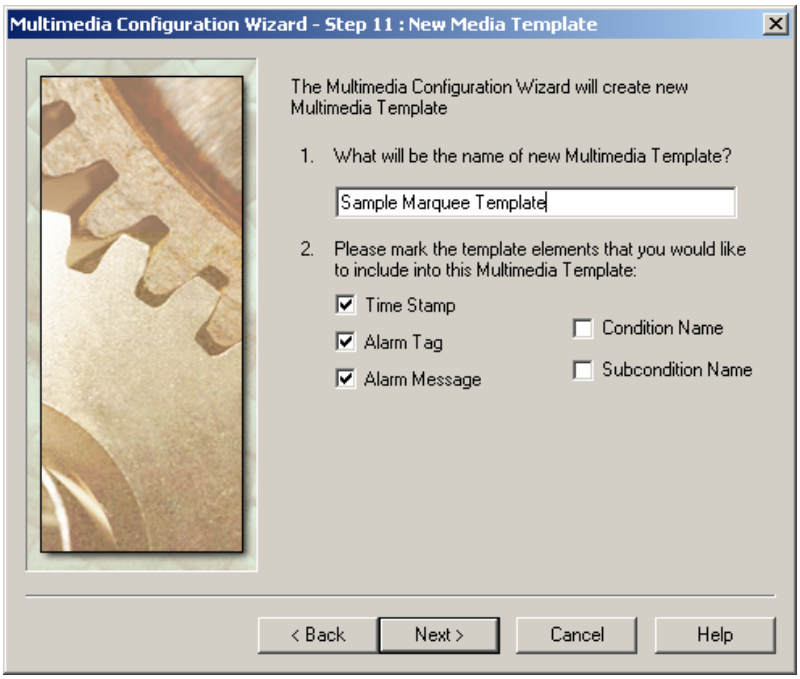


Figure 3.12. Step 11: Creating a New Media Template

12. Once the media template is configured, you have the option of selecting more multimedia actions for your action set, as shown in **Figure 3.13.** If you choose to add another multimedia action, specify a waiting time between the action you just configured and the action to be added. The Wizard will go back to Step 7, where the next multimedia agent can be selected. If you choose not to add another action set, the Wizard will proceed to Step 13.

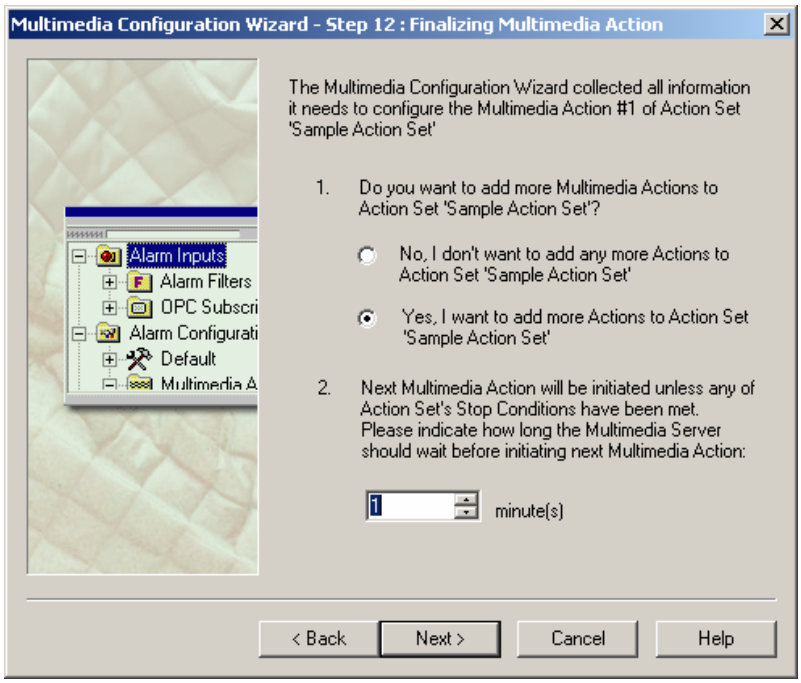


Figure 3.13. Step 12: Selecting Additional Actions for the Action Set

13. The last step of the Wizard gives you the option of adding more action sets to be connected to your alarm OPC server, as shown in **Figure 3.14.** If you choose to add another action set, the Wizard will take you back to Step 4. Otherwise, the Wizard will notify you that it has been completed successfully.

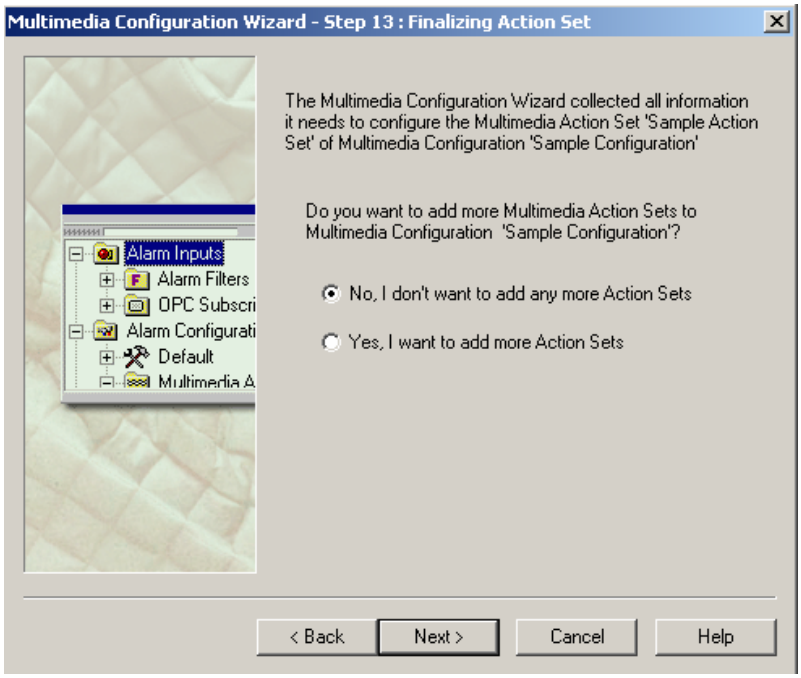


Figure 3.14. Step 13: Adding More Action Sets to the Configuration

14. Click the **Finish** button to complete your alarm configuration. Your new alarm configuration will appear under the **Alarm Configurations** tree control of the Configurator.

3.2 Making the Database Active

Once your alarm configuration is complete, you need to make sure that it is the active database. The database that is currently active is the one that the OPC server will use. To make the current database active, select **Make Active…** from the **File** menu of the Configurator, as shown in **Figure 3.15.** If the **Make Active…** selection is grayed out, then the current database is already the active database.

A dialog box will appear showing both the current active database and database that is currently being edited. To set the edited database as the active database, click the **Yes** button.

If you make changes to the database while the server is running, you can update the server with your changes while it is running. To do this, click the **Update Server Data** button on the toolbar.

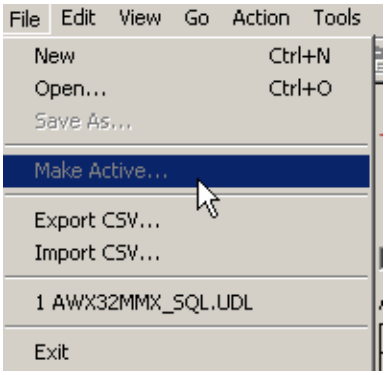


Figure 3.15. Activating the Database

Note: For information about advanced database settings and upsizing databases to MSDE and SQL, please see **Appendix D.**

3.3 Starting the Multimedia Server

In order for the Multimedia Server to use the information in the configuration database, the server must be placed into "runtime" mode. To start/stop the server, click the stoplight button on the toolbar, or select **Start Multimedia Server** from the **Action** menu, as shown in **Figure 3.16.**

If you make changes to the database while the server is running, you can update the server with your changes while it is running. To do this, click the **Update Server Data** button on the toolbar.

Note: You can also start the Multimedia using the ProcViewTray tool tray. For more information, please see the ProcViewTray Help documentation.

Figure 3.16. Starting the Multimedia Server

Chapter 4

Multimedia Agents

4.1 Introduction to Multimedia Agents

The Multimedia Configurator contains the following multimedia agents for configuring alarms:

- **E-mail Agent:** Sends an e-mail message. (See **Section 4.2.**)
- **Sound / Text-to-Speech Agent:** Plays prerecorded sounds and/or speech from text locally or remotely over a network. (See **Section 4.3.**)
- **Marquee Agent:** Creates a marquee window displaying a message locally or remotely over a network. (See **Section 4.4.**)
- **Pager Agent:** Sends a message to a pager. (See **Section 4.5** and **Appendix A.**)
- **Telephony Agents:** The **Call-out Agent** calls a defined number and gives a message with options to respond. The **Call-in Agent** enables callers to dial in by phone to get alarm information and browse for OPC Data Access tags. (See **Section 4.6, Chapter 9,** and **Appendix B.**)
- **Fax Agent:** Sends a message to a fax machine. (See **Section 4.7.**)
- **Instant Messaging Agent:** Sends a message to any computer using instant messaging. (See **Section 4.8** and **Appendix E.**)
- **Popup Agent:** Opens an application of your choice (e.g. Internet Explorer) to provide alarm messages. (See **Section 4.9**.)
- **Video Agent:** Plays a video, which can be a prerecorded video or a video captured at the moment of the alarm. (See **Section 4.10.**)
- **PA Agent:** Uses a public address (PA) system device to announce alarms and events over a loudspeaker. **(See Section 4.11.)**

Note: Be sure to test your multimedia agent configurations by using the **TEST** button in the configuration field for each agent.

Multimedia Agents Tree Control

The **Multimedia Agents** tree control of the Configurator is shown in **Figure 4.1.** In the right-hand pane, you can view the agents **By Type** or **By Node.**

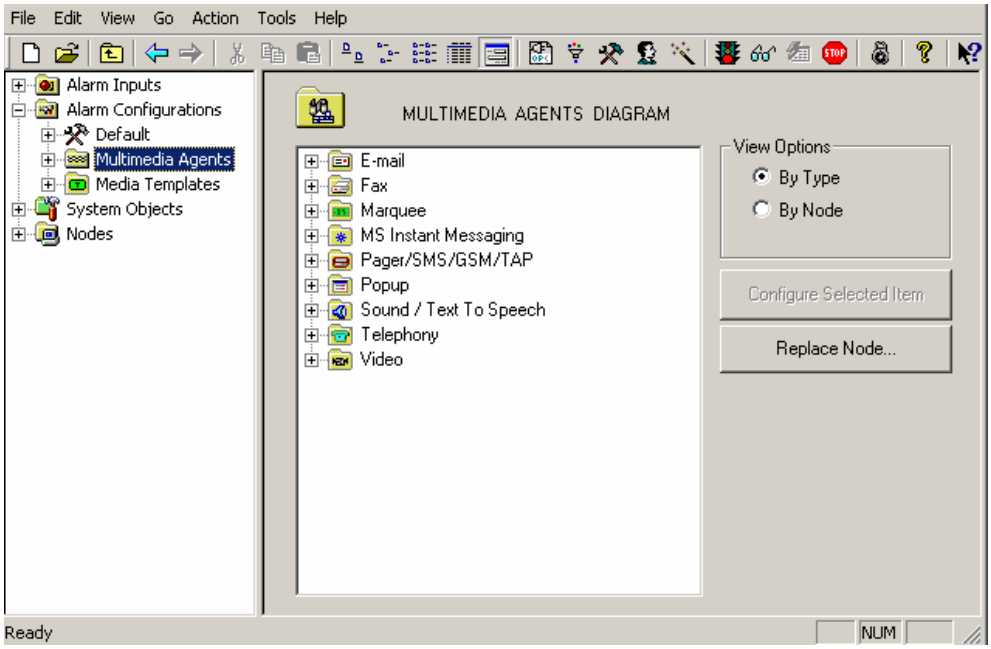


Figure 4.1. Multimedia Agents Tree Control

Clicking the **Replace Node** button opens the **Node Replace** dialog box, shown in **Figure 4.2,** which allows you to reassign multiple multimedia agents to run on a different node. In the **Replace** field, select the node you wish to

replace. In the **With** field, click the … button to select a new node. If the **With** field is empty, the local node is used by default.

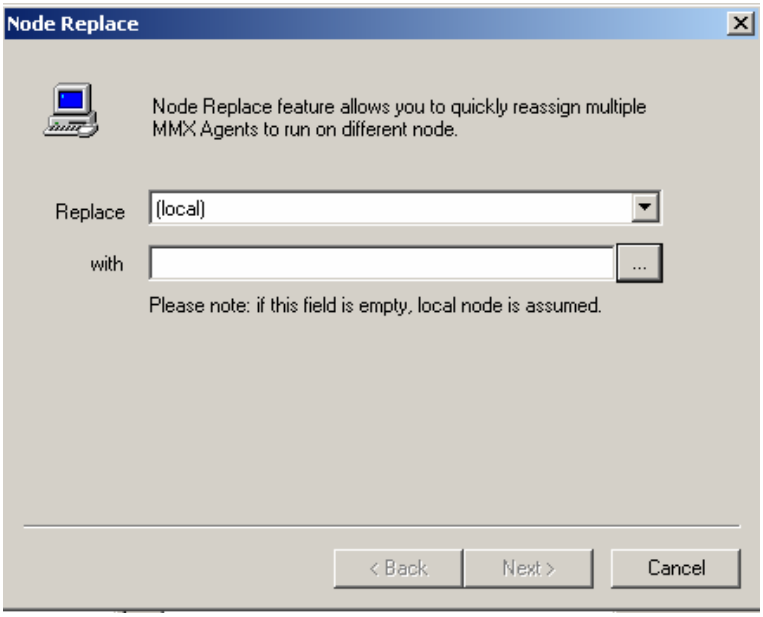


Figure 4.2. Replacing a Node

Clearing Agent Queue

Each multimedia agent configuration contains an **Empty Agent's Input Queue** button, as shown in **Figure 4.3.** Clicking this button cancels all requests made by the Multimedia Server to that agent, clearing all pending messages for the nodes on which the agent is configured.

Note: You can cancel queues to all agents by clicking the **Stop** button on the Configurator toolbar.

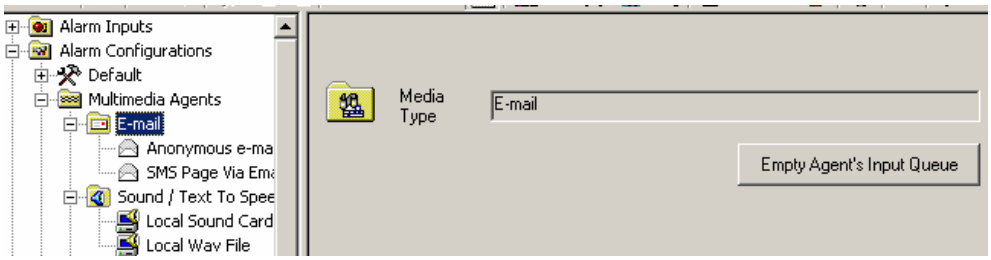


Figure 4.3. Emptying Agent Queue

4.2 E-mail Agent

The **E-mail Agent,** shown in **Figure 4.4,** allows you to receive and acknowledge alarms using an e-mail message. For information about acknowledging alarms and creating templates for the E-mail Agent, see **Appendix E.**

E-mail Configuration Fields

The following configuration fields are available for the E-mail Agent:

- **E-mail Name:** Enter a name for the e-mail contact.
- **Node Name:** Enter the node name for the computer from which you wish to send the e-mails. If left blank, the e-mails will be sent from the computer running the Multimedia Server. Click the **Browse** button to search for a node.
- **Scheduling:** If you are using scheduling, you can choose from the configured schedules on the drop-down list.
- **Send To:** Enter the e-mail address of the recipient to whom you wish to send the e-mail message.

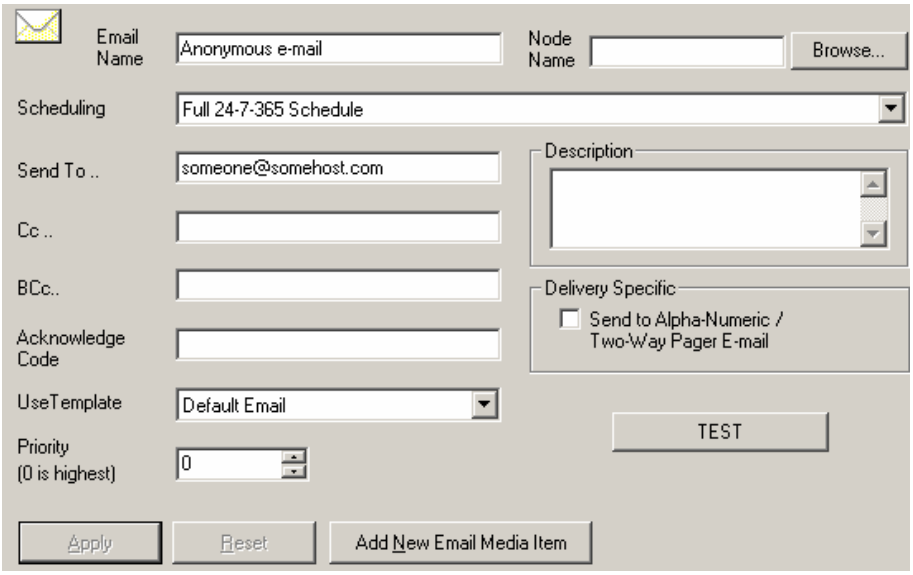


Figure 4.4. E-Mail Agent

- **Cc:** Sends a carbon copy of the e-mail to another recipient.
- **BCc:** Sends a "blind" carbon copy of the e-mail message to another recipient.
- **Acknowledge Code:** Enter the string you wish to use as the acknowledge code. (For information about acknowledging alarms using e-mail, see **Appendix E.**)
- **Use Template:** You must choose a template to be used with the E-mail Agent. The template determines the actual message that gets sent to e-mail recipients. The Configurator includes a template, called **Default Email,** created for sending e-mail messages. For more information about templates, please see **Chapter 5.**
- **Priority:** This is used with roles. If more than one person is on schedule (or one person has more than one agent configured using his schedule), then the agent with the highest priority will be the one that is carried out.
- **Description:** Allows you to add comments to the agent configuration.
- **Delivery Specific:** Uses the E-mail Agent to send an optimized message to a pager. You can still use the E-mail Agent to send a message to a pager without checking this. However, checking this decreases the character count of the identifier variables, thus reducing the cost in pagers that charge according to number of characters.

  Note: Using this option will limit you to 99,999 unique messages before resetting the numbering back to one.
- **TEST button:** Sends an e-mail message to test your configuration.
- **Apply button:** Saves all changes to the configuration database.
- **Reset button:** Clears all recently added information.
- **Add New E-mail Media Item:** Adds a new agent to be configured. You can also add a new E-mail Agent by right-clicking the **E-mail** folder on the tree control and selecting **New - E-Mail Contact** from the pop-up menu.

To operate the E-mail Agent, a MAPI-compliant third-party e-mail program must be on the computer from which e-mails are sent. Microsoft® Outlook is an example of a MAPI-compliant third party e-mail program. Microsoft Outlook Express can also be used and can be downloaded for free from Microsoft. However, unlike Outlook, Outlook Express will only work with POP3 e-mail servers. It is not necessary to have the e-mail program actively running on a Windows NT or Windows 2000 operating system. It is, however, necessary to have the e-mail program actively running on a Windows 98 operating system. Outlook 2002 and Outlook Express version 6 require additional security settings in order for the E-mail Agent to work properly. For more information, go to http://www.microsoft.com/office/ork/xp/appndx/appa11.htm.

The E-mail Agent will only operate on e-mail messages in the e-mail programs default folder. For example, a reply with an acknowledge code will only be seen if sent to the default e-mail programs folder (Inbox for Microsoft Outlook). If you set up your e-mail program to reroute your mail to other various folders, the multimedia agent

might not read the incoming e-mail. For more information about acknowledging alarms using the E-mail Agent, see **Appendix E.**

Using the E-mail Agent to Page

For high-volume applications, it is often better to use the E-mail Agent for pager support. This is due to the fact that a majority of pager services support e-mail to page. Set the **SentTo** field to "Pager number @Pager service." (e.g. 5551234@service.com). This causes the pager service's e-mail system to process the e-mail and send the information to the pager. This method avoids the delay associated with modem dial-up. The downside is that through put is limited by the Internet connection rather than the telephone connection.

4.3 Sound / Text-to-Speech Agent

The **Sound / Text-to Speech Agent,** shown in **Figure 4.5,** allows you to send alarm information using a sound message.

Note: The sound message is specified in the sound template, where you can select a sound (.wav) file from the **Sound Library** or enter a text message to be converted to speech. You can also add your own sound files to the Sound Library. For information about selecting sound files, please see **Section B.2** of **Appendix B.** For information about templates, please see **Chapter 5.**

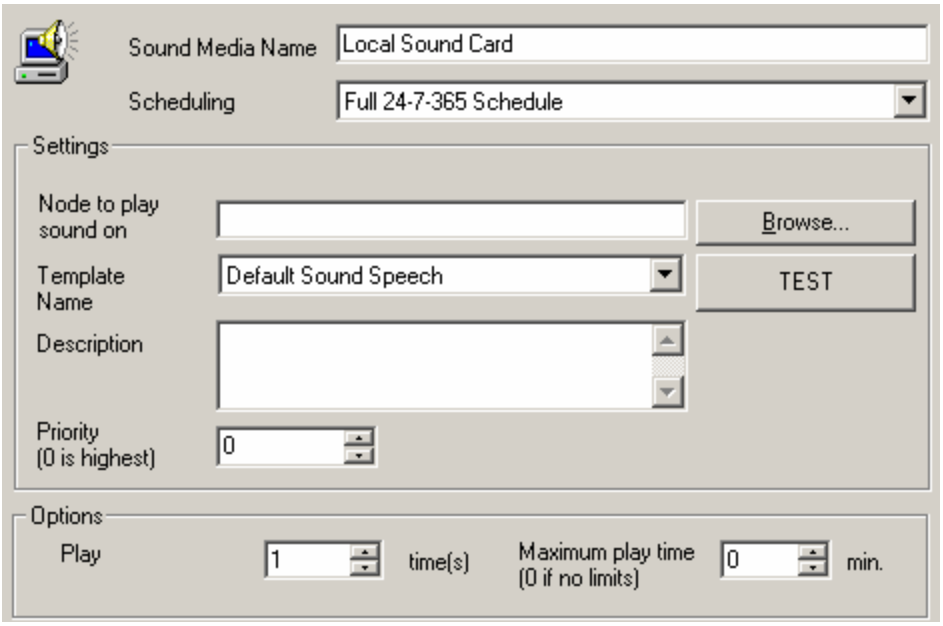


Figure 4.5. Sound / Text-to-Speech Agent

Sound Configuration Fields

The following configuration fields are available for the Sound / Text-to-Speech Agent:

- **Sound Media Name:** Enter a name for the configuration.
- **Scheduling:** If you are using scheduling, choose from the configured schedules on the drop-down list.
- **Node To Play Sound On:** Enter the node name for the computer on which you wish to play the sound. If this field is left blank, the sounds will be played on the computer running the Multimedia Server. Click the **Browse** button to search for a node.
- **Template Name:** You must choose a template to be used with the agent. The Agent plays a sound that is specified in the sound template, where you can select a sound (.wav) file from the Sound Library or enter a text message to be converted to speech. The Configurator already includes templates, called **Default Sound Wav** and **Default Sound Speech,** created for sending sound messages.
- **Description:** Allows you to add comments to the agent configuration.
- **Priority:** This is used with roles. If more than one person is on schedule (or one person has more than one agent configured using his schedule), then the agent with the highest priority will be the one that is carried out.

- **Play:** Plays the sound message a specified number of times.
- **Maximum Play Time:** Sets a maximum play time (in minutes).
- **TEST button:** Plays a sound message to test your configuration.
- **Apply button:** Saves all changes to the configuration database.
- **Reset button:** Clears all recently added information.
- **Add New Sound Media Item:** Adds a new agent to be configured. Note that you can also add a new Sound / Text-to-Speech Agent by right-clicking the **Sound / Text To Speech** folder on the tree control and selecting **New - Sound / Text To Speech** from the pop-up menu.

General Settings

To change the voice type, click on the **General Settings** button while in the main **Sound / Text To Speech** folder, as shown in **Figure 4.6.** If you do not see the **General Settings** button, make sure that **Dialog View** is checked on the **View** menu.

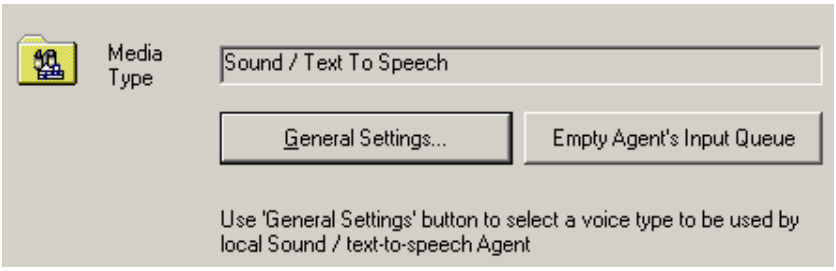


Figure 4.6. Sound / Text-to-Speech Agent: General Settings

Clicking the **General Settings** button opens the **Voice Configuration** dialog box, shown in **Figure 4.7,** which allows you to change the voice type.

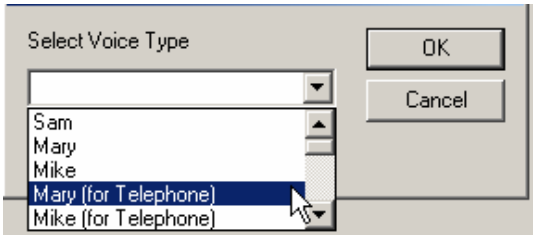


Figure 4.7. Voice Configuration Dialog Box

4.4 Marquee Agent

The **Marquee Agent,** shown in **Figure 4.8,** allows you to send alarm information using a message to a computer or a marquee device box. To acknowledge an alarm, right-click in the marquee window and select **Acknowledge.**

Marquee Configuration Fields

The following configuration fields are available for the Marquee Agent:

- **Marquee Media Name:** Enter a name for the Marquee Agent configuration.
- **Scheduling:** If you are using scheduling, choose from the configured schedules on the drop-down list.
- **Node To Use Marquee On:** Enter the node name for the computer on which you wish run the Marquee Agent. If left blank, the Marquee Agent will be run on the computer that is running the Multimedia Server. If you wish to display the message on a separate marquee device, this is configured under **General Settings** in the main **Marquee** folder. (See the "General Settings" section below.) Click the **Browse** button to search for a node.

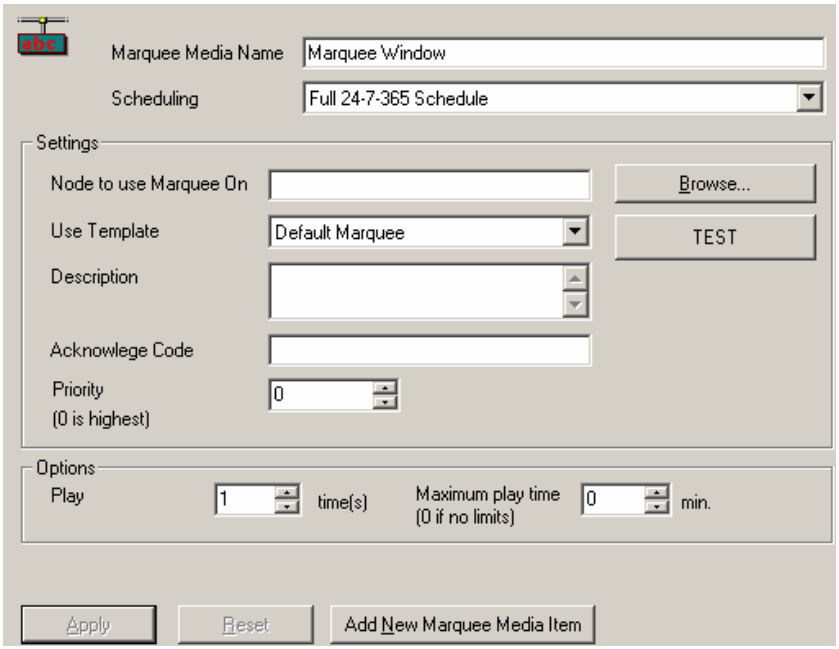


Figure 4.8. Marquee Agent

- **Use Template:** You must choose a template to be used with the agent. The template determines what information is displayed in the marquee message. The Configurator includes a template, called **Default Marquee,** created for sending marquee messages. For more information about templates, please see **Chapter 5.**
- **Description:** Allows you to add comments to the agent configuration.
- **Acknowledge Code:** Enter the string you wish to use as the acknowledge code.
- **Priority:** This is used with roles. If more than one person is on schedule (or one person has more than one agent configured using his schedule), then the agent with the highest priority will be the one that is carried out.
- **Play:** Specifies the number of times the marquee message will be displayed.
- **Maximum Play Time:** Sets a maximum play time (in minutes).
- **TEST button:** Displays a test marquee message.
- **Apply button:** Saves all changes to the configuration database.
- **Reset button:** Clears all recently added information.
- **Add New Marquee Media Item:** Adds a new Marquee Agent to be configured. Note that you can also add a new Marquee agent by right-clicking the **Marquee** folder on the tree control and selecting **New - Marquee Item** from the pop-up menu.

General Settings

The following options are set for all marquee items within the **Marquee** folder on the tree control. To change any of these options, click on the **General Settings** button while in the main **Marquee** folder, as shown in **Figure 4.9.** If you do not see the **General Settings** button, make sure that **Dialog View** is checked on the **View** menu.

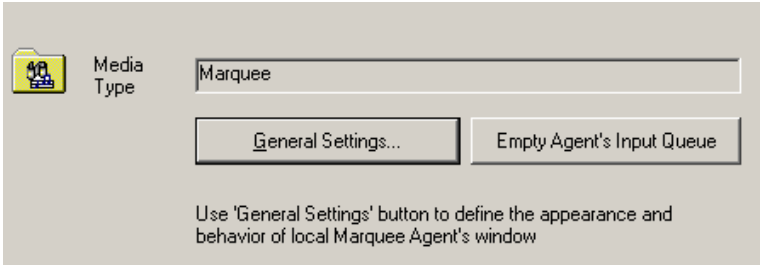


Figure 4.9. Marquee Agent: General Settings

Clicking the **General Settings** button opens the **Marquee Properties** dialog box, shown in **Figure 4.10,** which contains the following settings.

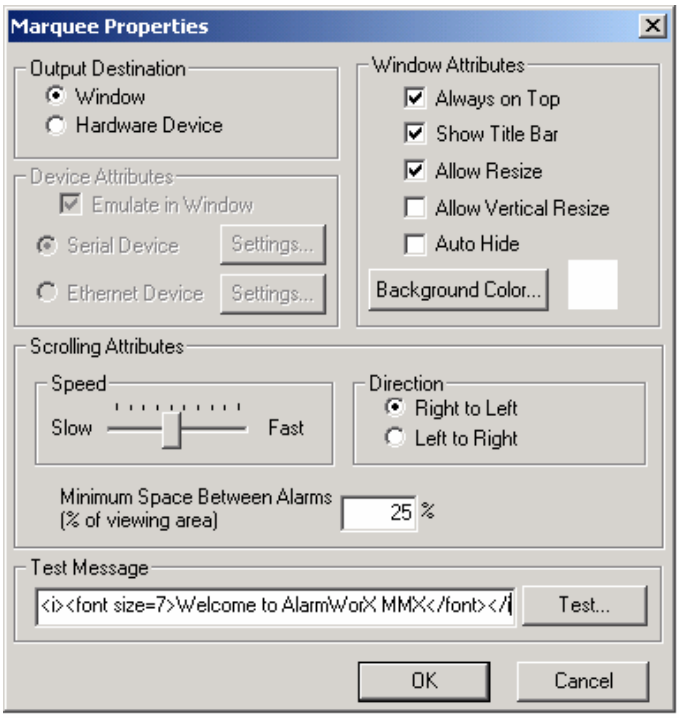


Figure 4.10. Marquee Properties Dialog Box

Output Destination

The **Output Destination** field allows you to choose whether to have the marquee displayed across a window on a computer monitor or across a separate hardware device.

Device Attributes

The **Device Attributes** field allows you to choose the type of device (serial or Ethernet) and to configure advanced settings for that device. Clicking the **Settings** button opens the **Serial Device Settings** dialog box, shown in **Figure 4.11,** which allows you to set the **Port, Baud, Data Bits, Parity, Stop Bits,** and **Maximum Characters.**

The **Stock Ticker** setting is a scrolling screen mode that allows the hardware device to scroll letters across the screen.

The **Traditional** mode allows the hardware device to display the entire text string. This mode displays the text string all at once without scrolling.

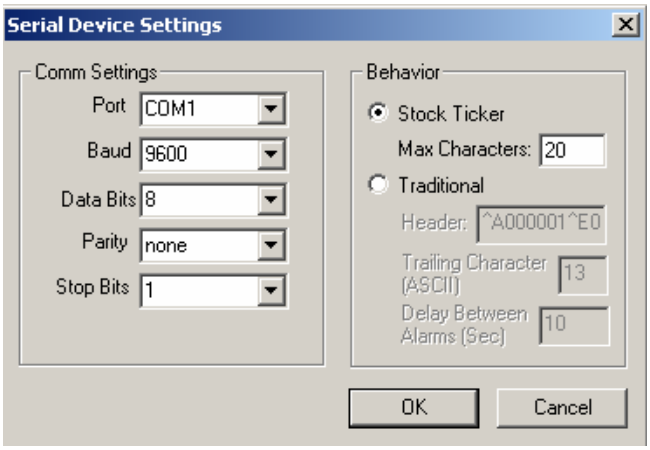


Figure 4.11. Serial Device Settings Dialog Box

The **Ethernet Device Settings** allow you to specify the port and IP address for the hardware device, as shown in **Figure 4.12.**

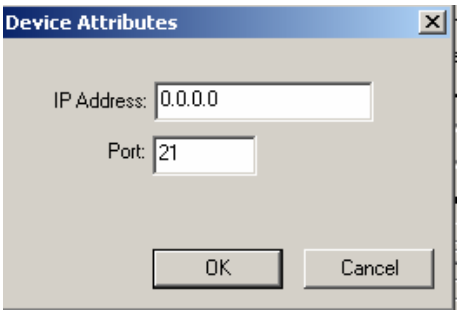


Figure 4.12. Ethernet Device Settings

Window Attributes

- **Always on Top:** Makes the marquee display visible on top of other open windows at all times.
- **Show Title Bar:** Shows (checked) or hides (unchecked) the title bar of the marquee window.
- **Allow Resize:** Resizes the marquee window horizontally while it is being displayed.
- **Allow Vertical Resize:** Resizes the marquee window horizontally as well as vertically while it is being displayed.
- **Auto Hide:** Automatically minimizes the marquee window after a message is displayed.
- **Background Color:** Sets the background color for the marquee window.

Scrolling Attributes

- **Speed:** Sets the speed of the marquee message display.
- **Direction:** Sets the direction of the marquee message display.
- **Minimum Space Between Alarms:** Sets the minimum amount of space (as a percentage of viewing area) between alarm messages.

Test Message

This option allows you send a test message showing the configuration options you have selected, as shown in the example in **Figure 4.13.**

Figure 4.13. Marquee Test Message

Note: If you choose to have the Marquee Agent run on a remote node and that node is running on Windows 95 or Windows 98, then the Marquee Agent must be open on that computer for it to display messages. If the node is running on Windows NT or Windows 2000, it is not necessary to have the agent already open.

4.5 Pager Agent

The **Pager Agent,** shown in **Figure 4.14,** allows you to send alarm information using a message to a pager. The Pager Agent sends alarm information to a pager via dial-up modems. (Please see **Appendix A** for information about pager services.)

Pager Agent Configuration Fields

The following configuration fields are available for the Pager Agent:

- **Pager Media Name:** Enter a name for this pager configuration.
- **Node Name:** Enter the node name for the computer from which you wish to send the e-mail messages. If this field is left blank, the e-mail messages will be sent from the computer that is running the Multimedia Server. Click the **Browse** button to search for a node.
- **Scheduling:** If you are using scheduling, choose from the configured schedules on the drop-down list.
- **Pager Number:** Enter the number of the pager to which you wish to send the message. Use the **General Settings** button in the **Pager/SMS/GSM/TAP** folder to configure pager services, dial-out numbers, modem properties, port settings, etc. (See the "Steps for Configuring the Pager Agent" section below for more information.) For details about pager service protocols, please see **Appendix A.**
- **Acknowledge Code:** Enter the string you wish to use as the acknowledge code.

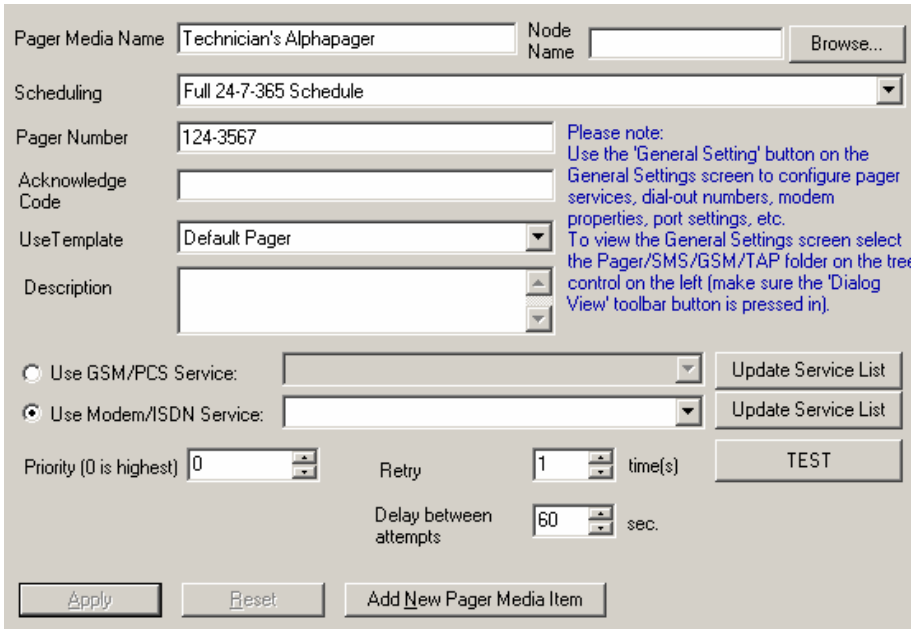


Figure 4.14. Pager Agent

- **Use Template:** You must choose a template to be used with the Pager Agent. The template determines the actual message that gets sent to configured pagers. You can select whether the message includes the timestamp of the alarm, the tag name that generated the message, the actual alarm message itself, and many other parameters. The Configurator includes a template, called **Default Pager,** created for sending alphanumeric pager messages. For more information about templates, please see **Chapter 5.**
- **Priority:** This is used with roles. If more than one person is on schedule (or one person has more than one agent configured using his schedule), then the agent with the highest priority will be the one that is carried out.
- **Description:** Allows you to add comments to the agent configuration.
- **TEST button:** Sends a pager message to test your configuration.
- **Use GSM/PCS Service:** Select the GSM/PCS service you wish to use with the Pager Agent from the drop-down list.
- **Use Modem/ISDN Service:** Select a service to use with your modem or ISDN line from the drop-down list.
- **Apply button:** Saves all changes to the configuration database.
- **Reset button:** Clears all recently added information.
- **Add New Pager Media Item:** Adds a new Pager Agent to be configured. Note that you can also add a new Pager Agent by right-clicking the **Pager/SMS/GSM/TAP** folder on the tree control and selecting **New - Pager Contact** from the pop-up menu.

Steps for Configuring the Pager Agent

When configuring the Pager Agent, use the following procedure. (For advanced pager settings and more detailed information about configuring the Pager Agent, please see **Appendix A.**)

Step 1: Configure a modem for your computer by going to the operating system's control panel and following the steps for configuring a modem.

Step 2: Ensure that your modem is working correctly by using HyperTerminal™ or any third-party dial-up software.

Step 3: In the Multimedia Configurator, open the **Alarm Configurations** folder and the **Multimedia Agents** subfolder. Click on **Pager/SMS/GSM/TAP,** and then click on the **General Settings** button located on the right-hand side of the window, as shown in **Figure 4.15.**

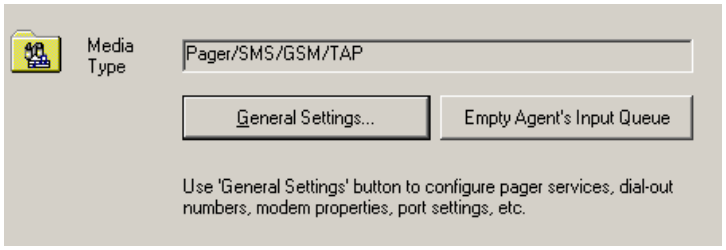


Figure 4.15. Pager Agent: General Settings

Step 4: Clicking the **General Settings** button launches the **Multimedia Pager TAP/SMS** dialog box, shown in **Figure 4.16.** Under **Diagnostic Utilities,** you can choose to enable the TAP log file, the **Multimedia Pager TAP Diagnostic** dialog box, and/or the **Multimedia Pager SMS Diagnostic** dialog box. The log file is only used for diagnostic utilities (limited to 10 KB).

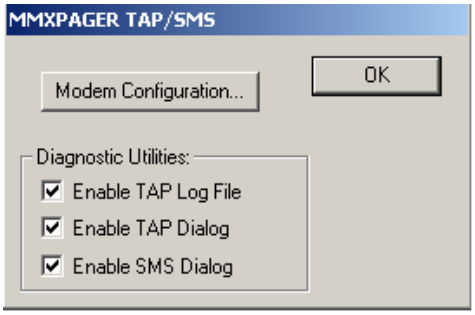


Figure 4.16. Multimedia Pager TAP/SMS Dialog Box

When the display enters runtime mode and the **Use GSM/PCS Service** option is selected in the Pager Agent configuration field, the **Pager SMS Diagnostic** dialog box will open, as shown in **Figure 4.17.**

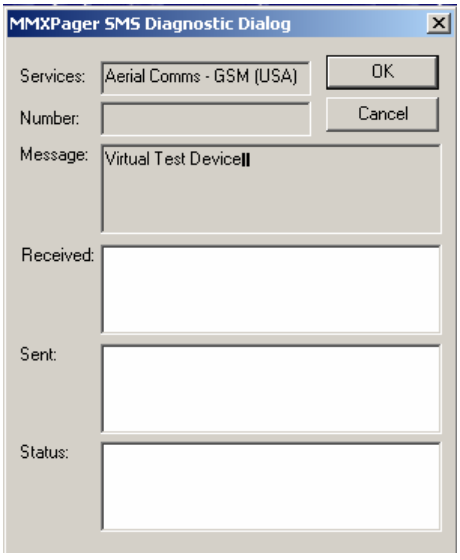


Figure 4.17. Pager SMS Diagnostic Dialog Box

When the display enters runtime mode and the **Use Modem/ISDN Service** option is selected in the Pager Agent configuration field, the **Pager TAP Diagnostic** dialog box will open, as shown in **Figure 4.18.** Clicking the **Open Log...** button opens the TAP log file (if the log file was enabled in the TAP/SMS dialog box).

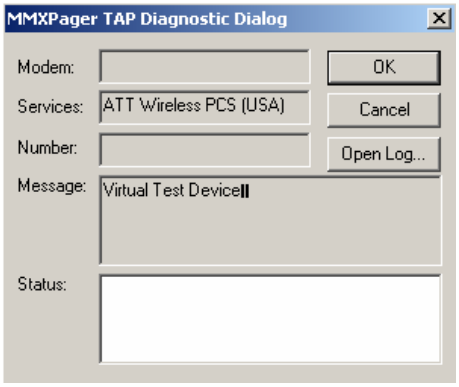


Figure 4.18. Pager TAP Diagnostic Dialog Box

Step 5: Click the **Modem Configuration** button to open the **DERDACK® Message Master™ Configuration Software** dialog box, shown in **Figure 4.19.** Select whether you wish to use modem/ISDN or GSM/PCS service for paging.

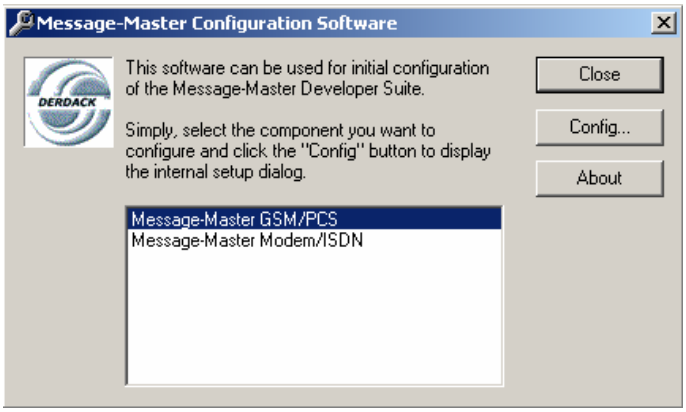


Figure 4.19. DERDACK Message Master Configuration Software Dialog Box

Step 6: Click the **Config...** button to open the **Settings** dialog box, shown in **Figure 4.20.** Fill out the information in the **General, Ports, Services,** and **Messages** tabs with the appropriate information. At any time, you can get help by clicking the **Help** button to launch the Message Master help documentation.

Note: Figure 4.20 shows the configuration settings for GSM/PCS configuration. The Modem/ISDN configuration settings are slightly different. On the **Defined Services** tab of the Modem/ISDN configuration settings dialog box, if you create a new service, the country code for the service must be included in parentheses at the end of the service name. When specifying a telephone number for the service, there is a strict protocol for how you enter the number, which must conform to the following format. Parentheses, where shown, are necessary:

+1 (area code) number. Example: +1 (800) 5551234

For international calls, replace the '1' with the appropriate country code. See the Message Master help or **Appendix A** for more information.

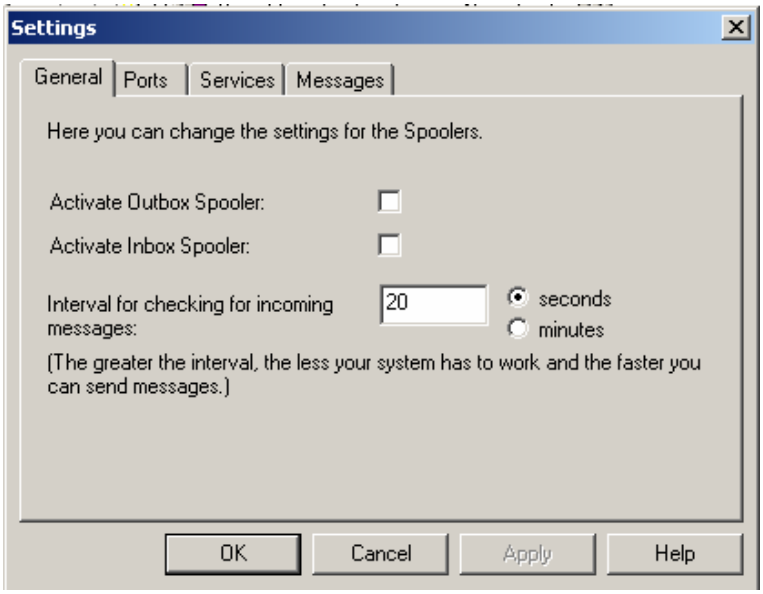


Figure 4.20. DERDACK Message Master Configuration Settings Dialog Box

Step 7: In the Multimedia Configurator, fill out all of the necessary configuration fields.

Note: If no services are listed next to the two options for Modem/ISDN and GSM/PCS, you need to manually launch an application to install these services. (This application is normally executed at the end of the installation for AlarmWorX32 Multimedia.) The application, called **SrvSetup.exe,** is located in the "Bin/Pager" directory. Run this application, and at the first menu select "Services.inf." See **Appendix A** for more information.

4.6 Telephony Agents

Two separate agents are included under the **Telephony** folder of the Configurator tree control: the **Call-in Agent** and the **Call-out Agent.**

4.6.1 General Settings

To set the default settings for the Telephony Agents (Call-in and Call-out), click on the **Telephony** folder, as shown in **Figure 4.21.** If you do not see the **General Settings,** make sure that **Dialog View** is checked on the **View** menu. Configure the default settings for the Telephony Agents as described below.

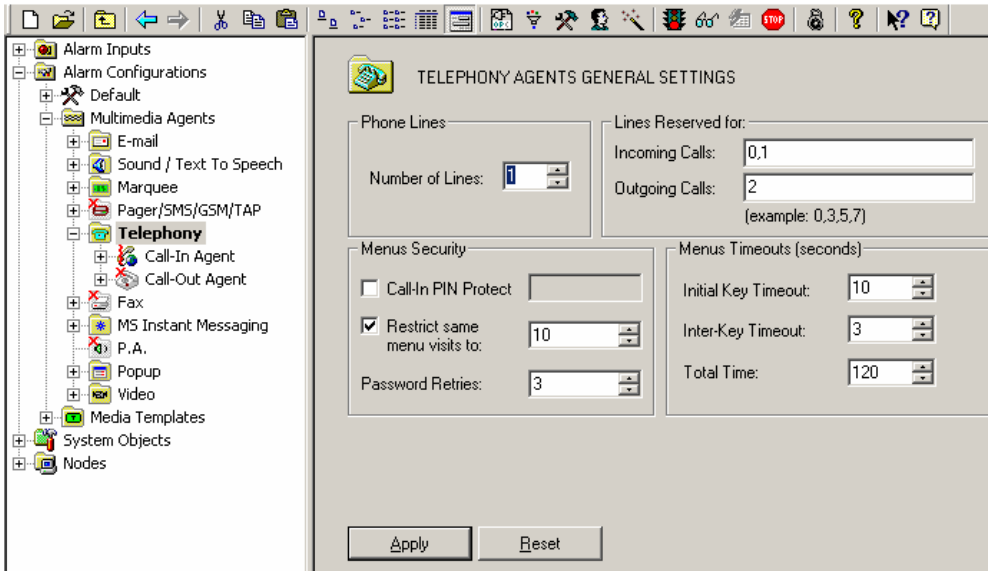


Figure 4.21. Telephony Agents: General Settings

Phone Lines

- **Number of Lines:** Sets the total number of phone lines that will be used by the Phone Agents.

  Note: The number of lines specified must be less than or equal to the actual number of phone lines that will be used. If the number of lines specified in the Configurator is greater than the actual number of lines in use, the Call-in Server will work under the assumption that additional phone lines are available even though the lines do not actually exist. Although up to 20 lines are supported, the number of lines that can be used may be limited by the type of Dialogic board. See **Appendix B** for details.

  Note: The telephony agents currently support up to 20 phone lines. However, the agent has been tested with a maximum of four phone lines.
- **Incoming Calls:** Specifies which phone lines will be reserved for incoming calls.
- **Outgoing Calls:** Specifies which phone lines will be reserved for outgoing calls.

  Note: When specifying which phone lines will be reserved for incoming and outgoing calls, the first line will always be line "0". For example, suppose you will be using a total of three lines, as shown in Figure 4.21. The first line is "0", the second line is "1", and the third line is "2". Since the first and second lines will be used for incoming calls, enter "0" and "1" in the **Incoming Calls** field, as shown in Figure 4.21. The third line will be used for outgoing calls, so enter "2" in the **Outgoing Calls** field, as shown in Figure 4.21.

  Any phone lines that are not reserved will be used as general purpose lines (i.e. for either incoming or outgoing calls).

  Note: If you are using only one telephone line, you cannot reserve the single line for both incoming and outgoing calls. Therefore, to configure a single-line system, both the **Incoming Calls** field and the **Outgoing Calls** field should be left blank.

Menus Security and Timeouts

- **Call-in PIN Protect:** Specify a numeric password or PIN that users must enter prior to each menu in order to progress through the phone menus in the Call-in Agent.

  Note: This is different from the general security settings used for logging into the phone system. (The login settings are configured in the Call-in Agent tree control.)
- **Restrict same menu visits to :** Limits the number of times a user can access the same menu through the Call-in Agent. This limits the overall time users can remain in the phone system to prevent users from tying up the phone lines.
- **Password Retries:** Sets the number of times a user will be allowed to enter an incorrect password on the phone keypad.
- **Initial Key Timeout:** Sets the number of seconds the phone will wait for a key press before retry.
- **Inter-Key Timeout:** Sets the number of seconds allowed between key presses on the phone keypad before ending caller input.
- **Total Time:** Sets the total consecutive time (in seconds) that a caller may spend in the same menu before timeout. This includes the time the system uses to process and deliver the text-to-speech messages to the caller.

Dialogic Configuration

You must have a telephony card installed on the computer on which you are running the Telephony Agents (both Call-in and Call-out). AlarmWorX32 Multimedia supports Intel® Dialogic® boards. **Dialogic boards do not work for Windows 98, so neither the Call-in Agent nor the Call-out Agent will work on Windows 98.** You also need to have an analog phone line connected to the board. (**Note:** Digital lines are not supported.) Only Dialogic boards are supported for the current version of AlarmWorX32 Multimedia. Please see **Appendix B** for information about installing and configuring Intel Dialogic boards. For more information about purchasing and installing Intel Dialogic boards, please visit the Intel Web site at www.intel.com/network/csp/products/index_vp.htm.

4.6.2. Call-in Agent

The **Call-in Agent,** shown in **Figure 4.22,** enables users to access OPC data over the phone. The Call-in Agent configuration sets up the voice and key entries and menu options based on information supplied from the Multimedia configuration database and the current state of OPC data or alarms and the security level of the user calling into the system. The Call-in Agent configuration is too extensive to be described in this section. For complete information about configuring settings for the Call-in Agent, please see **Chapter 9.**

Note: The following Configurator features do NOT apply to the Call-in Agent: the Multimedia Configuration Wizard, action sets, and schedules.

Note: Dialogic boards do not work for Windows 98, so the Call-in Agent will not work on Windows 98.

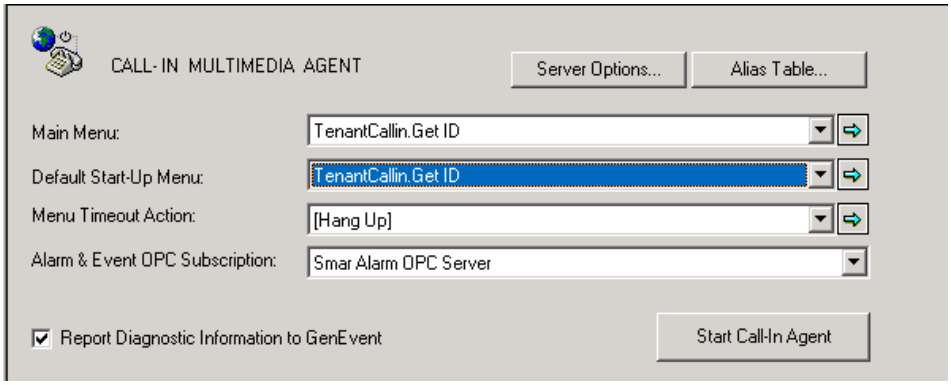


Figure 4.22. Call-in Agent: General Settings

4.6.3. Call-out Agent

The **Call-out Agent,** shown in **Figure 4.23,** sends alarm messages out over the telephone. **Note: Dialogic boards do not work for Windows 98, so the Call-out Agent will not work on Windows 98.**

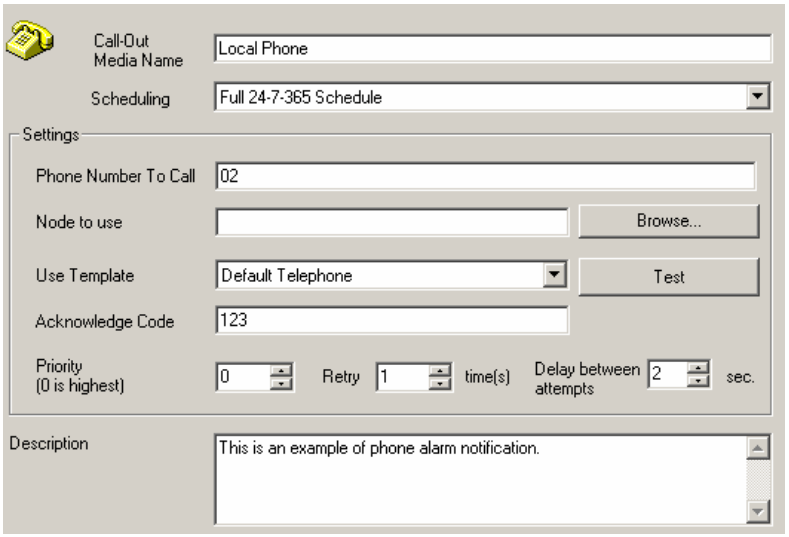


Figure 4.23. Call-out Agent

Call-out Agent Configuration Fields

The following configuration fields are available for the Call-out Agent in the Configurator tree control under **Local Phone,** as shown in Figure 4.23. (**Note: Local Phone** is an example Call-out Agent configuration.)

- **Call-Out Media Name:** Enter a name for the Phone Agent configuration.
- **Scheduling:** If you are using scheduling, choose from the configured schedules on the drop-down list.
- **Phone Number To Call:** Enter the phone number you want the agent to call.
- **Node To Use:** Enter the node name for the computer from which you to run the Phone Agent. If this field is left blank, the Phone Agent will be run from the computer running the Multimedia Server. Click the **Browse** button to search for a node.

- **Use Template:** You must choose a template to be used with the agent. The template determines the actual message that gets sent to the phone number specified. The Configurator includes a template, called **Default Telephone,** created for sending call-out messages over the phone. For more information about templates, please see **Chapter 5.**
- **TEST button:** Tests your call-out configuration.
- **Acknowledge Code:** Enter the number you wish to use as the acknowledge code.
- **Priority:** This is used with roles. If more than one person is on schedule (or one person has more than one agent configured using his schedule), then the agent with the highest priority will be the one that is carried out.
- **Retry:** Sets the number of attempted calls to make to the specified phone number before timing out.
- **Delay between attempts:** Sets the number of seconds between subsequent phone call retry attempts.
- **Description:** Allows you to add comments to the agent configuration.
- **Apply button:** Saves all changes to the configuration database.
- **Reset button:** Clears all recently added information.
- **Add New Telephone Media Item:** Adds a new Call-out Agent to be configured. Note that you can also add a new Call-out Agent by right-clicking the **Call-out Agent** folder on the tree control and selecting **New - Phone Contact** from the pop-up menu.

4.7 Fax Agent

The **Fax Agent,** shown in **Figure 4.24,** allows you to send alarm information using a fax machine. The fax agent supports class 1, most class 2, and class 2.0 fax standards. It is not possible to be more specific on the class 2 standard because it was never a finalized standard. (**Note:** Color faxes are not supported.)

Fax Configuration Fields

The following configuration fields are available for the Fax Agent:

- **Fax Media Name:** Enter a name for the Fax Agent configuration.
- **Node To Send Fax From:** Enter the node name for the computer on which you wish to run the Fax Agent. If this field is left blank, the Fax Agent will be run on the computer that is running the Multimedia Server. Click the **Browse** button to search for a node.

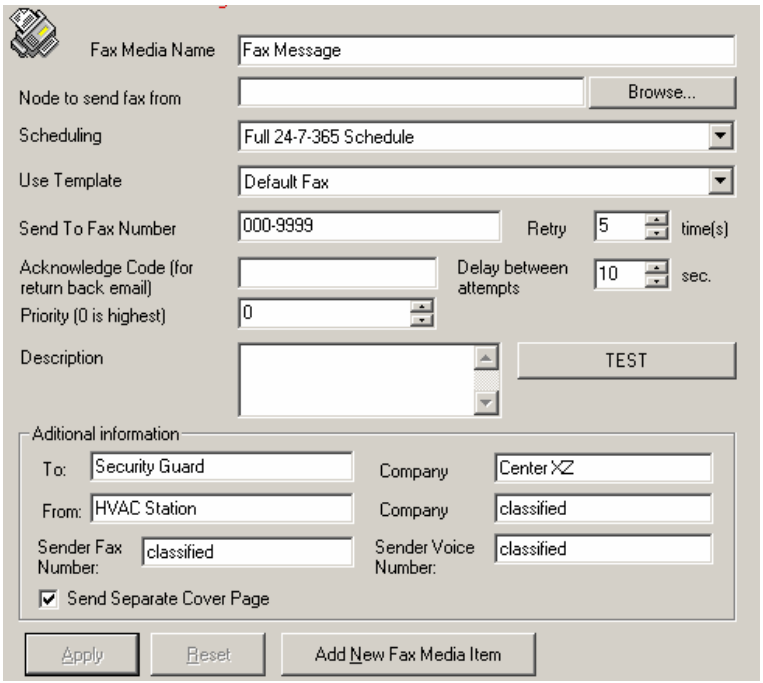


Figure 4.24. Fax Agent

- **Scheduling:** If you are using scheduling, choose from the configured schedules on the drop-down list.
- **Send To Fax Number:** Enter the fax number here.

- **Acknowledge Code:** This field is not supported.
- **Use Template:** You must choose a template to be used with the agent. The template determines the actual message that gets faxed to the number specified. The Configurator includes a template, called **Default Fax,** created for sending messages to a fax machine. For more information about templates, please see **Chapter 5.**
- **Description:** Allows you to add comments to the agent configuration.
- **Priority:** This is used with roles. If more than one person is on schedule (or one person has more than one agent configured using his schedule), then the agent with the highest priority will be the one that is carried out.
- **TEST button:** Sends a test fax based on the configuration settings.
- **Apply button:** Saves all changes to the configuration database.
- **Reset button:** Clears all recently added information.
- **Add New Fax Media Item:** Adds a new Fax Agent to be configured. You can also add a new Fax Agent by right-clicking the **Fax** folder on the tree control and selecting **New - Fax Contact** from the pop-up menu.
- **Send Separate Cover Page:** When this box is checked, the Fax Agent includes a cover page with the fax message. The fax template contains a **Fax Cover Page** field, which specifies a cover page design that will be used for all fax messages sent using the Fax Agent. The following fax file formats are supported: .pg, .cpe, and .fmf. For more information about templates, please see **Chapter 5.**

  Note: The location of the **Fax Cover Page** field in the fax template does not matter because the cover page is, by default, the first item to be sent in a fax message. However, if several cover pages are selected for a single template, the Fax Agent will use only the first cover page listed.

4.8 Instant Messaging Agent

The **Instant Messaging Agent,** shown in **Figure 4.25,** allows you to send and acknowledge alarm information using Microsoft MSN® Messenger Service. (For information about installing and configuring MSN Messenger Service, acknowledging alarms using MSN Messenger Service, and creating templates for the Instant Messaging Agent, please see **Appendix E.**)

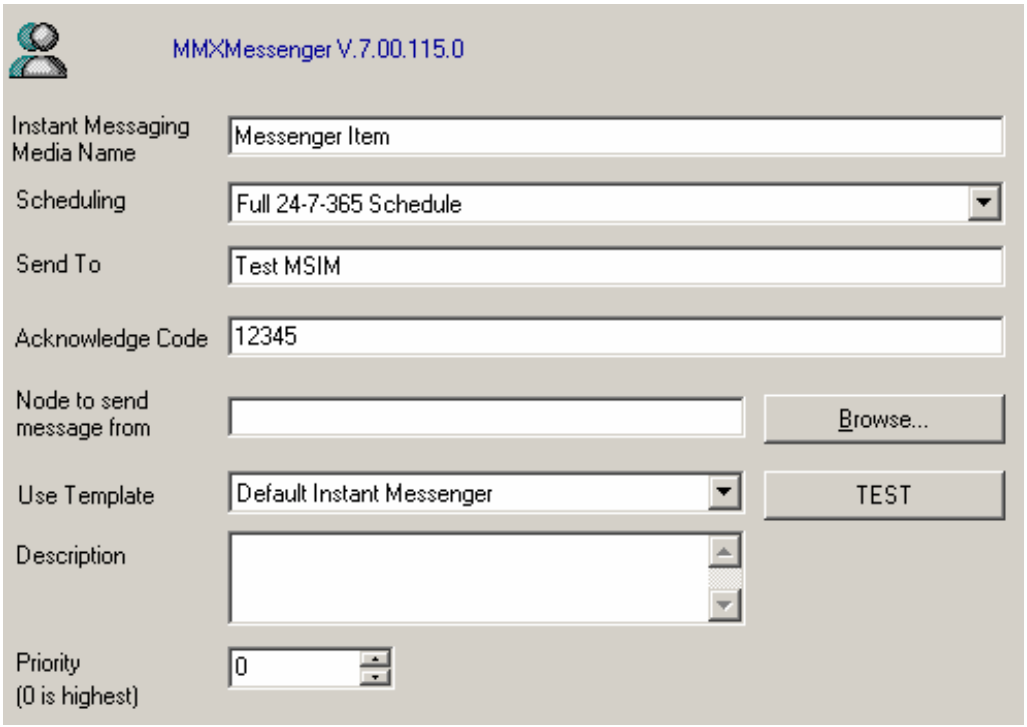


Figure 4.25. Instant Messaging Agent

Instant Messaging Configuration Fields

The following configuration fields are available for the Instant Messaging Agent:

- **Instant Messaging Media Name:** Enter a name for the Instant Messaging Agent configuration.
- **Scheduling:** If you are using scheduling, choose from the configured schedules on the drop-down list.
- **Send To:** For the Multimedia Instant Messaging Agent to work properly, MSN Messenger Service must be installed and running on the computer on which the Instant Messaging Agent is installed. The user name specified in the **Send To** field must also be an existing contact in the server computer's messaging client that is currently online.
- **Acknowledge Code:** Enter the string you wish to use as the acknowledge code. (For information about acknowledging alarms using instant messaging, see **Appendix E.**)
- **Node To Send Message From:** Enter the node name for the computer on which you wish to run the Instant Messaging Agent. If left blank, the Instant Messaging Agent will be run on the computer that is running the Multimedia Server. Click the **Browse** button to search for a node.
- **Use Template:** You must choose a template to be used with the agent. The template determines the actual message that gets sent to instant message recipients. The Configurator includes a template, called **Default Instant Messenger,** created for sending instant messages. For more information about templates, please see **Chapter 5.**
- **Description:** Allows you to add comments to the agent configuration.
- **Priority:** This is used with roles. If more than one person is on schedule (or one person has more than one agent configured using his schedule), then the agent with the highest priority will be the one that is carried out.
- **TEST button:** Sends a test instant message based on your configuration.
- **Apply button:** Saves all changes to the configuration database.
- **Reset button:** Clears all recently added information.
- **Add New Instant Messaging Media Item:** Adds a new agent to be configured. Note that you can also add a new Instant Messaging Agent by right-clicking the **Instant Messaging** folder on the tree control and selecting **New - Instant Messaging Media Item** from the pop-up menu.

4.9 Popup Agent

The **Popup Agent,** shown in **Figure 4.26,** allows you to open and execute a file on a computer. For example, you can configure a Popup Agent to open Microsoft Internet Explorer and display alarm information within Internet Explorer.

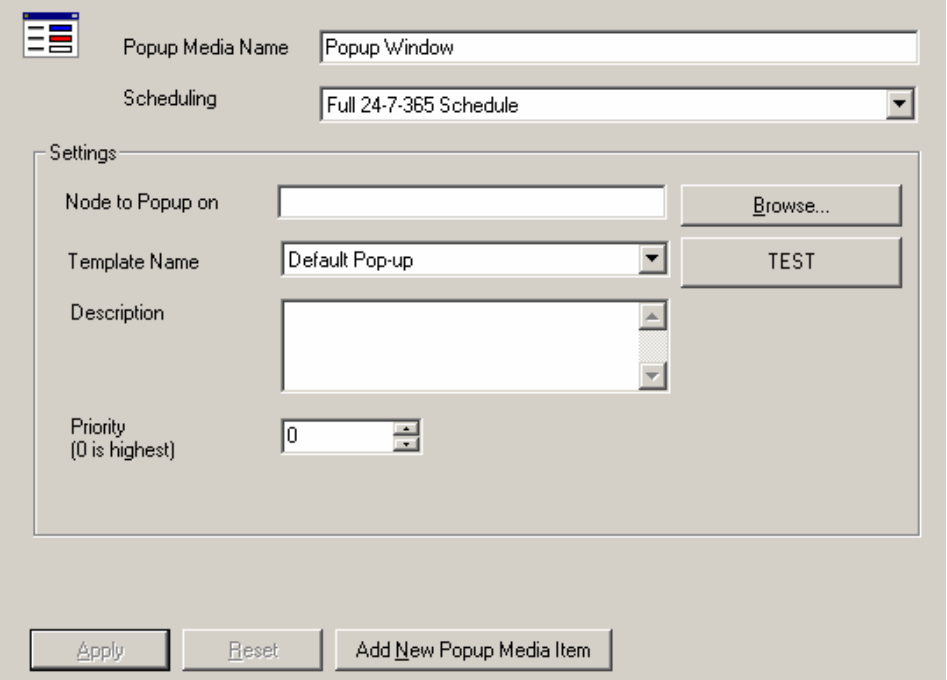


Figure 4.26. Popup Agent

Note: The Popup Agent is designed to launch other applications. The intent is that an operator will then close the applications when finished. The agent itself neither closes these applications nor limits the number of applications it will launch. Because of this, it is possible that an unmonitored station, using the Popup Agent, could launch so many applications as to run out of system resources.

Popup Configuration Fields

The following configuration fields are available for the Popup Agent:

- **Popup Media Name:** Enter a name for the Popup Agent configuration.
- **Scheduling:** If you are using scheduling, choose from the configured schedules on the drop-down list.
- **Node To Popup On:** Enter the node name for the computer on which you wish to run the Popup Agent. If this field is left blank, the Popup Agent will be run on the computer that is running the Multimedia Server. Click the **Browse** button to search for a node.
- **Template Name:** You must choose a template to be used with the agent. The template determines the actual message that gets displayed in the popup window. The Configurator includes a template, called **Default Popup,** created for sending messages using popup windows. For more information about templates, please see **Chapter 5.**
- **Description:** Allows you to add comments to the agent configuration.
- **Priority:** This is used with roles. If more than one person is on schedule (or one person has more than one agent configured using his schedule), then the agent with the highest priority will be the one that is carried out.
- **TEST button:** Displays a test popup window based on your configuration.
- **Apply button:** Saves all changes to the configuration database.
- **Reset button:** Clears all recently added information.
- **Add New Popup Media Item:** Adds a new agent to be configured. You can also add a new Popup Agent by right-clicking the **Popup** folder on the tree control and selecting **New - Popup Item** from the pop-up menu.

4.10 Video Agent

The **Video Agent,** shown in **Figure 4.27,** allows you to use a video device to send a video or a snapshot to a computer providing alarm information.

Video Configuration Fields

The following configuration fields are available for the Video Agent:

- **Video Media Name:** Enter a name for this Video Agent configuration.
- **Scheduling:** If you are using scheduling, choose from the configured schedules on the drop-down list.
- **Play On Node:** Enter the node name for the computer on which you wish to run the Video Agent. If left blank, the Video Agent will be run on the computer that is running the Multimedia Server. Click the **Browse** button to search for a node.
- **Snapshot Node:** Enter the node name for the computer on which you wish to run the Video Agent Snapshot. If this field is left blank, the Video Agent Snapshot will be run on the computer running the Multimedia Server. Click the **Browse** button to search for a node.

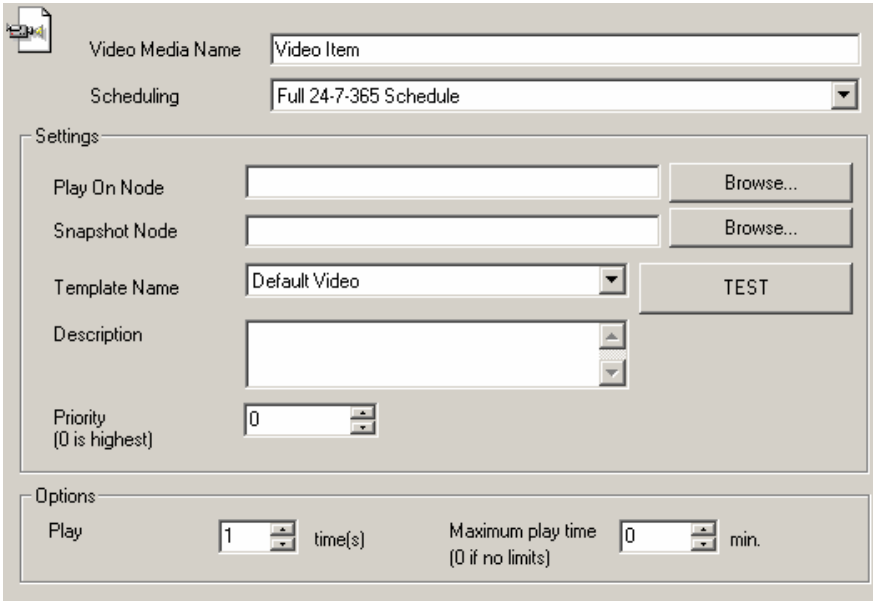


Figure 4.27. Video Agent

- **Template Name:** You must choose a template to be used with the agent. The template determines the actual video file (.avi, .mpg, .mpeg, or .mov) or snapshot (image) file (.bmp, jpg, jpeg, or .gif) that gets displayed. The Configurator includes a template, called **Default Video,** created for sending messages using video. For more information about templates, please see **Chapter 5.**
- **Description:** Allows you to add comments to the agent configuration.
- **Priority:** This is used with roles. If more than one person is on schedule (or one person has more than one agent configured using his schedule), then the agent with the highest priority will be the one that is carried out.
- **Play:** Plays the video for a specified number of times.
- **Maximum Play Time:** Sets a maximum video play time (in minutes).
- **TEST button:** Tests your video configuration settings.
- **Apply button:** Saves all changes to the configuration database.
- **Reset button:** Clears all recently added information.
- **Add New Video Media Item:** Adds a new agent to be configured.

General Settings

The following options are set for all video items within the **Video** folder. To change any of these options, click on the **General Settings** button while in the main **Video** folder, as shown in **Figure 4.28.** If you do not see the **General Settings** button, make sure that **Dialog View** is checked on the **View** menu.

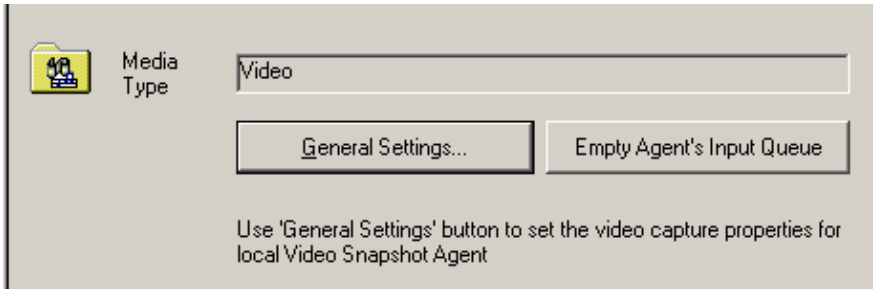


Figure 4.28. Video Agent: General Settings

Clicking **General Settings** opens the **Snapshot Configuration** dialog box, shown in **Figure 4.29.**

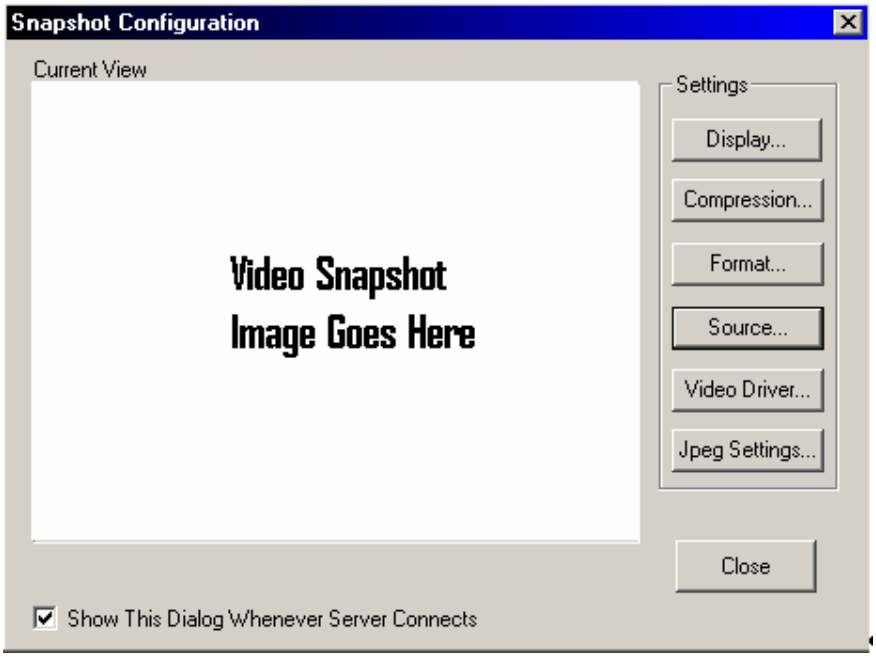


Figure 4.29. Snapshot Configuration Dialog Box

The **Snapshot Configuration** dialog box contains the following options:

- **Display:** Allows you to choose video display options.
- **Compression:** Choose a component to use if you wish to compress the video files.
- **Format:** Sets options such as color, mirror, flip, and size.
- **Source:** Configures hardware settings based on the video driver you choose to use.
- **Video Driver:** Choose a video driver to use.
- **Jpeg Settings:** Select the quality level and the option to display in color or grayscale for snapshots.

For information about video configuration settings, please see **Appendix C.**

Note: The general settings for video agents may vary depending on which video capture device is used. General settings will only function if you have a video capture device (Web camera) installed on your computer. If no video capture device is found, you will get an error message informing you that the application could not find any video capture devices.

If you are using a remote node for video capture, you will have to go to the remote node and change the settings for video capture on that remote node. If there is no Multimedia Configurator installed on your video capture node, then you can run the "MMXSnapshot.exe" in the "Bin" directory to set the general settings.

4.11 P.A. Agent

The **P.A. Agent,** shown in **Figure 4.30,** allows you to use a public address (PA) system device to announce alarms and events over a loudspeaker. The PA Agent configuration settings are directly tied to the telephony agent settings. The Call-out Agent configuration must be activated in order for the PA agent to work. A Dialogic board is also required for the PA agent.

P.A. Configuration Fields

The following configuration fields are available for the P.A. Agent:

- **P.A. Media Name:** Enter a name for the configuration.
- **Scheduling:** If you are using scheduling, choose from the configured schedules on the drop-down list.
- **Phone Number to Call:** Enter a P.A. system access phone number.
- **Node Name:** Enter the node name for the computer on which you wish to play the P.A. message. If this field is left blank, the sounds will be played on the computer running the Multimedia Server. Click the **Browse** button to search for a node.
- **Use Template:** You must choose a template to be used with the agent.
- **Description:** Allows you to add comments to the agent configuration.
- **Priority:** This is used with roles. If more than one person is on schedule (or one person has more than one agent configured using his schedule), then the agent with the highest priority will be the one that is carried out.
- **Play:** Plays the P.A. message a specified number of times.
- **Maximum Play Time:** Sets a maximum play time for the message (in minutes).
- **TEST button:** Plays a P.A. message to test your configuration.
- **Apply button:** Saves all changes to the configuration database.
- **Reset button:** Clears all recently added information.
- **Add New P.A. Media Item:** Adds a new agent to be configured. Note that you can also add a new P.A. Agent by right-clicking the **P.A.** folder on the tree control and selecting **New - P.A. Item** from the pop-up menu.

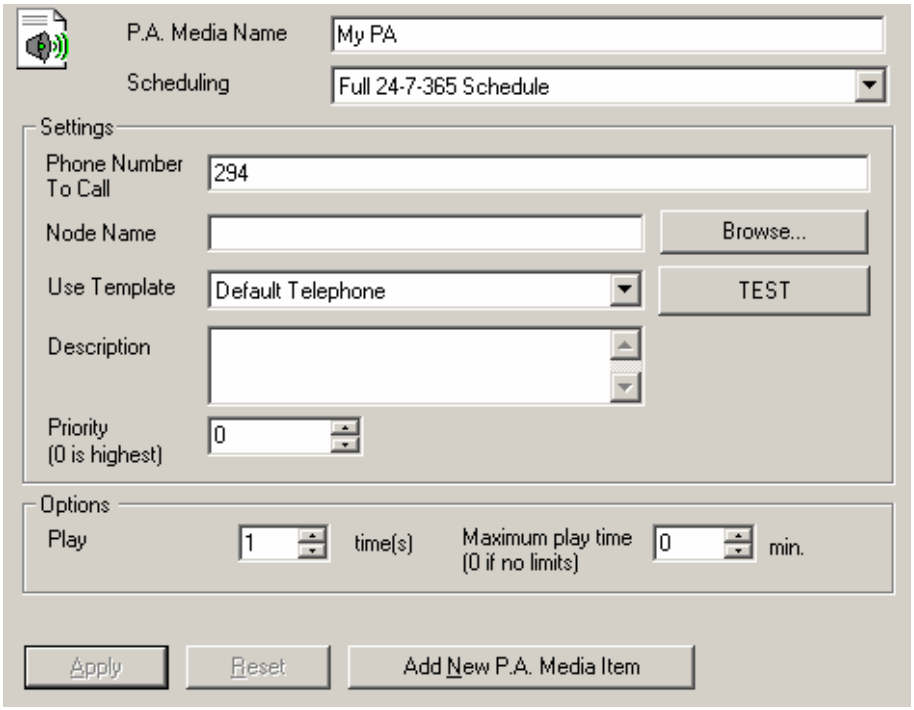


Figure 4.30. P.A. Agent Configuration Settings

Chapter 5

Media Templates

5.1 Introduction to Media Templates

When configuring a multimedia agent, you must select a **media template** to apply to that agent. Templates allow you to configure design elements, including what and how much information to display when presenting an alarm. A default template is available for each type of agent. You can use or modify any one of the default templates provided for you, or you can create a new template as follows:

1. Right-click on the **Media Templates** folder on the tree control of the Multimedia Configurator screen and select **New > Media Template,** as shown in **Figure 5.1.** The **Media Templates** folder is located in the **Alarm Configurations** folder.

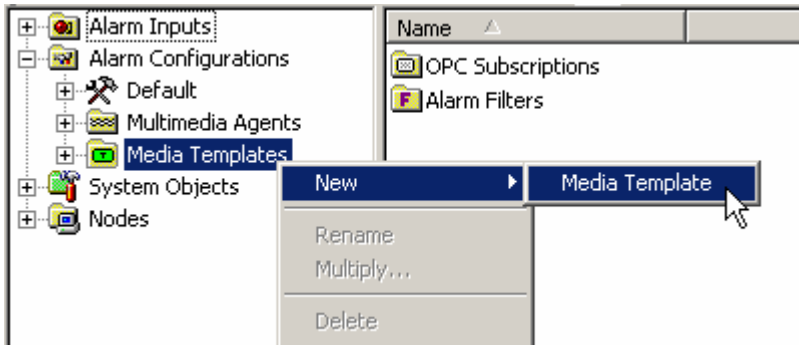


Figure 5.1. Creating a New Media Template

2. The new media template appears along with the configuration dialog box shown in **Figure 5.2.** In the **Template Name** field, enter a name for the template you are creating.

3. Select which **Template Type** you wish to create. You can choose from e-mail, sound/text-to-speech, marquee, pager, phone, fax, instant messaging, PA, popup window, or video.

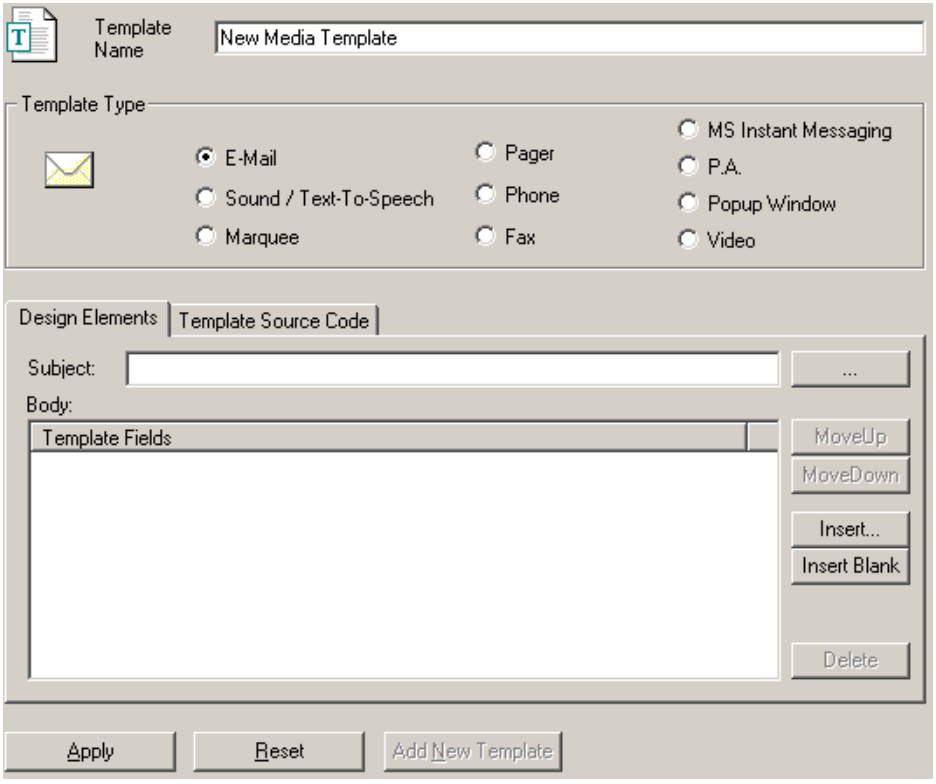


Figure 5.2. New Media Template Configuration

4. Click on the **Design Elements** tab of the template configuration dialog box, shown in Figure 5.2. If you are configuring a template with an option to enter a subject field, you may do so by clicking on the **…** button to the right of the **Subject** field. This opens the **Template Definition Wizard** dialog box, shown in **Figure 5.3,** which contains a list of available field types to add. For a list of field types, please see the "Template Field Types" section later in this chapter. Choose a field type and select from the additional options under **Field Properties;** and then click **Insert.** If you wish to change the order of the fields or to delete a field, use the appropriate buttons to do so. The **Insert Blank** button will insert a line break.

   Note: Template configuration is for advanced users. It is recommended that you use the default templates that are provided with the Configurator.

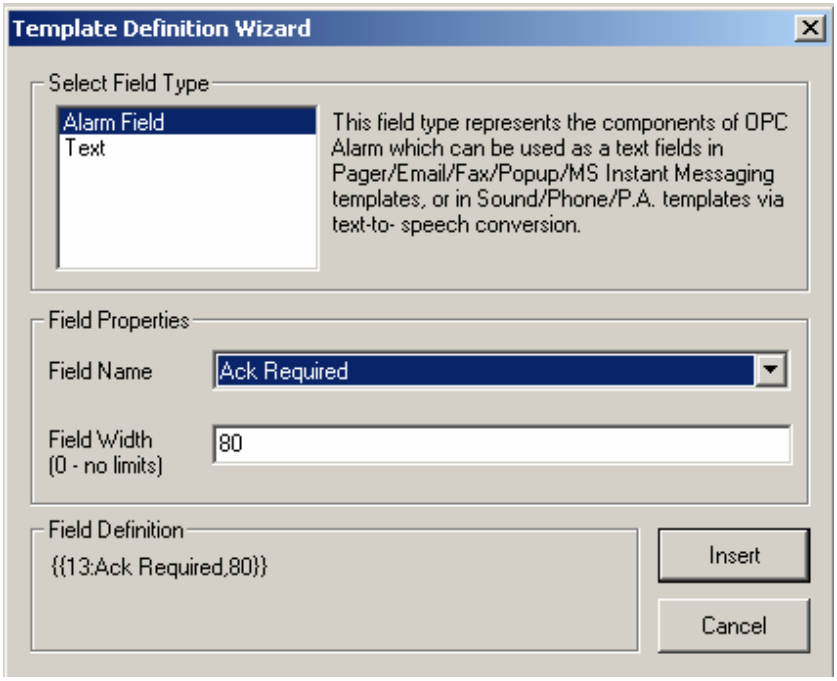


Figure 5.3. Template Definition Wizard Dialog Box

5. Click on the **Template Source Code** tab in the template configuration dialog box. The **Template Source Code** tab, shown in **Figure 5.4,** displays all of the fields in an editable format. If you need to manually edit a field, you can do so here.

   Note: The **Template Source Code** tab is recommended for advanced users only. Do not modify any fields here unless you are absolutely sure of what you are doing.

6. Click **Apply** on the template configuration dialog box to apply the changes.

Note: For additional template settings, see **Appendix B, Appendix C,** and **Appendix E.**

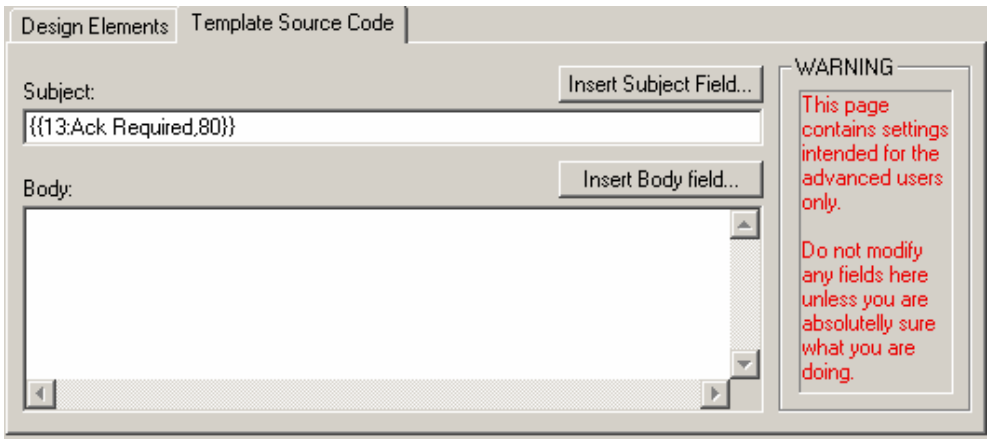


Figure 5.4. Media Template Configuration: Template Source Code Tab

5.2 Template Field Types

The following is a list of all template field types. When configuring a media template, clicking the **Insert** button on the **Design Elements** tab of the template configuration dialog box, shown in Figure 5.2, to display which field types are available for that particular template type.

Note: For more information about template field types, please see **Appendix B, Appendix C,** and **Appendix E.**

Alarm Field: Represents the components of OPC alarms; allows you to choose from a drop-down list of fields; allows you to enter a field width limit (enter zero for no limit); can be used as a text field with pager, e-mail, fax, popup, and instant messaging templates, or in sound, and phone (call-out) templates via text-to-speech conversion.

E-mail Attachment: Represents any file that can be sent as an e-mail attachment; used with e-mail templates.

Sound File: Represents a sound file; allows you to choose from the included Sound Library or to add your own sound file (.wav, .mid) to the Sound Library. Can be used with sound and phone (call-out) templates.

Delay: Enters a value representing a time delay in milliseconds before the next template item will be activated; can be used with sound, phone, and video templates.

File: Represents a file for the Popup Agent to process; used with popup templates.

URL: Represents a URL for the Popup Agent to display; used with popup templates.

SnapShot Capture: Enters a value representing the amount of time the Video Agent will take to capture a video snapshot; used with video templates.

Picture File: Represents an image file (.gif, .jpg); used with video templates.

Video File: Represents a video file (.avi, .mpg, .mpeg, .mov); used with video templates.

Text: Allows you to enter plain text; used by all media templates.

HTML Text: Text embedded in HTML tags; used by marquee, popup, and video templates.

Fax Cover Page: This template field is a cover page design that will be used for all fax messages sent using the Fax Agent. The following fax cover page file formats are supported: .pg, .cpe, and .fmf.

Note: The location of the **Fax Cover Page** field in the fax template does not matter because the cover page is, by default, the first item to be sent in a fax message. However, if several cover pages are selected for a single template, the Fax Agent will use only the first cover page listed.

5.3 Templates and HTML

This section is designed for advanced users who have some familiarity with HTML (Hyper Text Markup Language) and wish to see how HTML can be used in media templates. For more information on HTML, consult an HTML or Web-authoring tutorial.

The templates for the Marquee, Popup, and Video agents can respond to simple HTML tags used to define the appearance of alarm data upon the agents' loading. If you are comfortable using HTML and are comfortable with the organization of the multimedia templates, you may find it simpler to write HTML directly into the **Template Source Code** field (see Figure 5.3) designed for advanced users. Information on how HTML is handled in each agent is shown below.

5.3.1 Popup Agent

All HTML text written in a popup agent's template is taken as is, written to an HTML file, and launched in Microsoft Internet Explorer. Alarm fields are translated into appropriate text and inserted into the HTML file wherever specified in the template. **Table 5.1** shows the example provided for the default popup template.

Table 5.1. Popup Template Items

HTML Command	Function
$BASE_PATH$\MMXSounds\Alarm.wav	Launches the file "Alarm.wav" using whatever installed media are capable of playing .wav files.
<html>	Begins HTML content.
<title>MMX Alarm</title>	Makes the title of the popup window "MMX Alarm."
<body bgcolor=#0000ff>	Begins the body of HTML text and gives the popup window a blue background. ('#0000ff' is a coded way of specifying blue.)
	Sets the font color to yellow and the font size to 6 (about 24 point).
[Alarm.Message]	Shows the message text of the current alarm in the font style specified on the previous line.
	Ends yellow text.
</body>	Ends body text.
</html>	End HTML.

5.3.2 Video Agent

The Video Agent handles HTML text and alarm fields the same way that the Popup Agent handles them. The difference in the Video Agent's template is the inclusion and interpretation of images and video files. Whenever the Video Agent encounters an image or video in the template, it automatically embeds HTML code around the image or video, allowing Internet Explorer to recognize and display the item as it should be shown. **Table 5.2** shows the items contained in the default video template.

Note: You will notice in this case that <html> and <body> have been omitted. For simple sections of HTML text like the one in this example, they are optional. Please see **Appendix C** for more information about video templates.

Table 5.2. Video Template Items

HTML Command	Function
<title>Intruder Alert</title>	Makes the title of the video popup page "Intruder Alert."'
	Sets the type color to red.
Intruder Alert! 	Writes "Intruder Alert" in red type, centered and in "Heading 1" style.
[Alarm.Message]	Writes the alarm message centered and in "Heading 2" style.
<table width = 100% border=1> <tr><td>	Creates a table with two columns. The left column is labeled "Authorized Employee," and the right column is labeled "Last person to enter."
Authorized Employee </td><td>	
Last person to enter </td></tr><tr><td>	
$BASE_PATH$\SnapShots\Eng1.jpg	Inserts the image "Eng1.jpg" in the table below "Authorized Employee."'
</td><td>	
Snapshot capture (millisec.) 0	Takes a still image of what the Web cam is looking at and places the image to the right of "Eng1.jpg."
</td></tr></table>	Closes the table.

5.3.3 Marquee Agent

Using HTML for the Marquee Agent is slightly different from standard HTML because the Marquee Agent does not load or display an entire Web page. The Marquee Agent uses HTML to determine the appearance of the text to be scrolled across the window. Since the Marquee Agent uses HTML only to modify the appearance of its text, it responds only to a limited set of HTML tags. The following is a list of useful HTML tags for the Marquee: <font>, <I>, <u>, <b>, <h1>, <h2>, <h3>, <body>, <blink>. All other HTML tags are completely ignored. If plain text is entered, or if alarm messages are entered into the template with no HTML around them, then the text will simply be displayed in plain, black, 10-point font. **Table 5.3** shows the items contained in the default marquee template. All of the "'ignored" fields have been left in to demonstrate how one can copy and paste HTML code from an HTML editor directly into the template and still generate the desired text.

Note: The <body> field was used here to force the background to a different color. The **Marquee Properties** dialog box has a **Background Color** option on its property page. An HTML-specified background color overrides the Marquee's configured background color.

Table 5.3. Marquee Template Items

HTML Command	Function
<HTML>	Ignored.
<BODY bgcolor=#530210>	Makes the background of the Marquee Agent dark red/maroon.
<DIV>	Ignored.
<FONT face=dot-matrix size=6 color=green>[Alarm.Time]	Shows the current time in dot-matrix font, green and size 6 (about 24 point).
[Alarm.Source]	Shows the Alarm Source in the same font.
<FONT face=dot-matrix size=+1 color=red>[Alarm.Message]</FONT></FONT>	Shows the Alarm Message in dot-matrix font, green, and size 7 (about 36 point).
</DIV>	Ignored.
</BODY>	Optional.
</HTML>	Ignored.

Chapter 6

Schedules and Roles

6.1 Introduction to Schedules

The scheduling feature in AlarmWorX Multimedia allows you to configure an alarm action set so that an alarm message will be sent to a particular person only if that person is available according to his or her schedule. If you wish to use scheduling, you must configure the schedules before setting up your agents or alarm action set. Schedules are located under the **System Objects** tree control.

Under the **Schedules** configuration folder on the tree control of the Multimedia Configurator screen, there are **group schedules** and **personal schedules.** You must set up a group schedule first, and then you may add personal schedules to the group schedule. Some example schedules are provided for you by default.

There are two basic ways to use schedules:

- You can have a group schedule that has a configured time calendar, and every personal schedule under that group follows that time calendar. Use this method when each person will have the same basic schedule. For example, this method is appropriate if your group schedule will be for a specific time shift during which every person works the same times.
- The other way to use the schedules is to have a group schedule that does not have a configured time calendar and to configure each personal schedule with its own time calendar. Use this method when each person has a unique time schedule. Once you set up the time calendars, you can add or exclude specific dates and times from any group or personal schedule.

6.2 Creating a New Schedule Configuration

Use the following steps to configure a new schedule:

1. Right-click on the **Schedules** folder in the tree control and select **New > Group Schedule** from the pop-up menu, as shown in **Figure 6.1.**

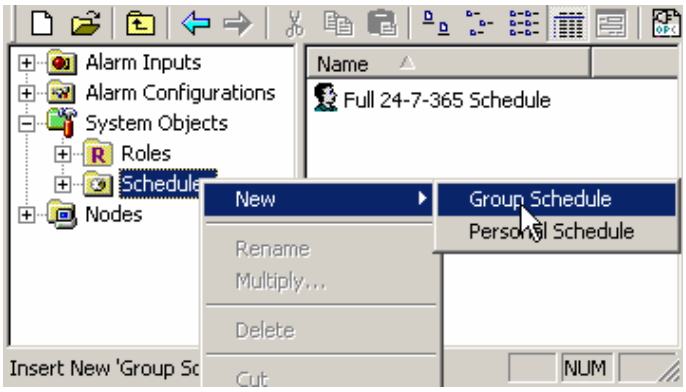


Figure 6.1. Creating a New Group Schedule

2. The group schedule configuration field will be displayed in the right-hand pane, as shown in **Figure 6.2.**

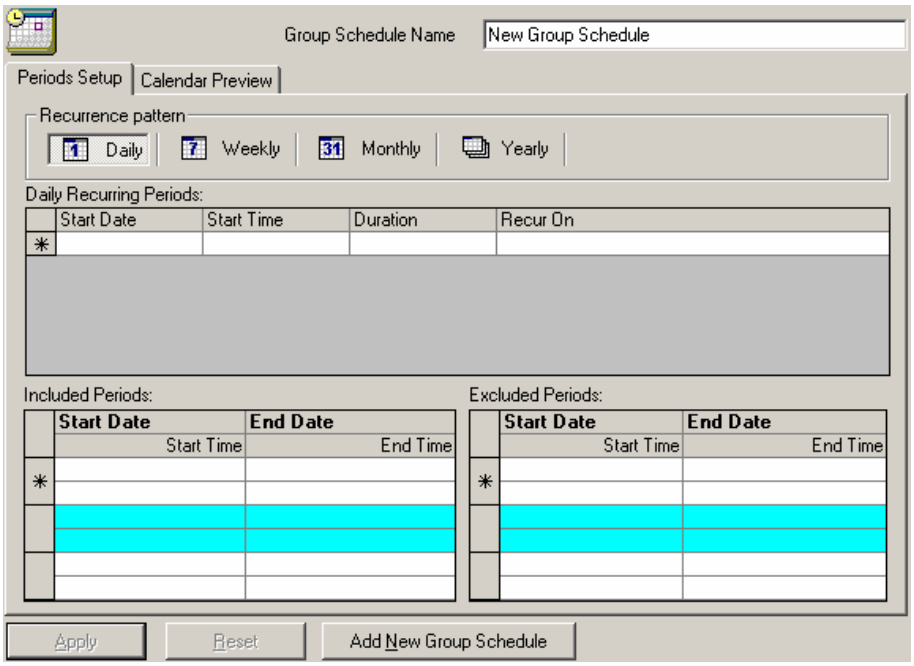


Figure 6.2. Configuring a New Group Schedule

3. Type a name for the new group schedule, as shown in Figure 6.2.
4. You will be setting up a time calendar for the whole group. Enter the scheduling information in the **Periods Setup** tab. You may click on the **Calendar Preview** tab to view the current schedule. For more information on the **Periods Setup** tab and the **Calendar Preview** tab, see the sections below.
5. Click the **Apply** button to apply your changes.
6. On the tree control, right-click on the group schedule you have just created and select **New > Personal Schedule** from the pop-up menu, as shown in **Figure 6.3.**

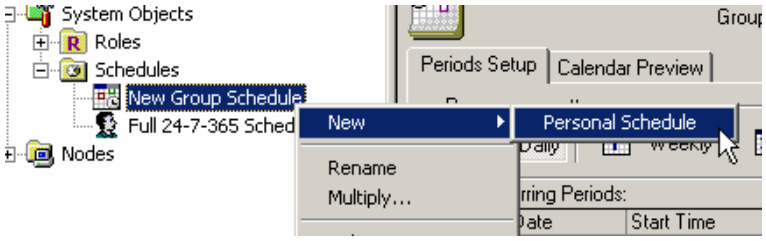


Figure 6.3. Creating a New Personal Schedule

7. Type a name (e.g. Chief Engineer) for the new personal schedule in the configuration field, as shown in **Figure 6.4.**
8. **Roles** allow you to configure an alarm action set so that an alarm message will be sent to the person who is on schedule from a list of configured people. For example, if you want to call a shift supervisor when a certain alarm appears, you can set up a role called "Shift Supervisors." (Please see section 6.3 for information about configuring roles.) Then when the alarm occurs, the alarm message will be sent to whichever shift supervisor is on schedule. In order to associate a personal schedule with a role, you must select a role from the drop-down list under **Role,** as shown in Figure 6.4.
9. If you will be setting up a time calendar for this personal schedule, enter the scheduling information in the **Periods Setup** tab. You may click on the **Calendar Preview** tab to view the current schedule. Any group times that you configured will be included in every personal schedule under that group schedule and will appear in the calendar preview.
10. Click the **Apply** button to apply your changes.

Note: If you set up a time calendar in a group schedule *and* in a personal schedule, then that person's schedule will include all scheduled times from both the group schedule and the personal schedules.

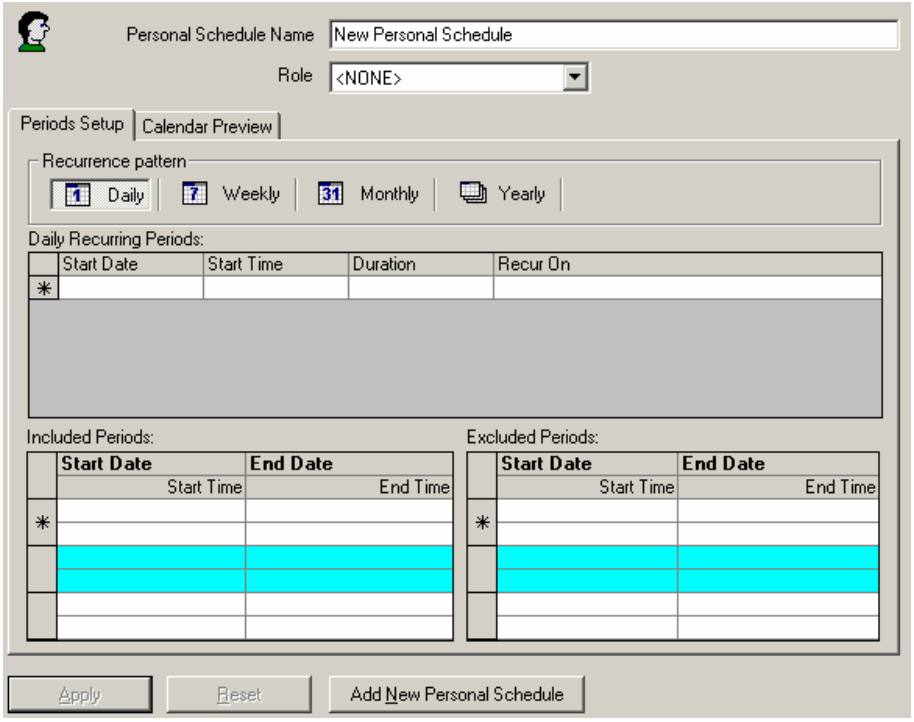


Figure 6.4. Configuring a New Personal Schedule

6.2.1 Setting up Periods

Use the **Periods Setup** tab, shown in **Figure 6.5,** to set up either a group schedule or a personal schedule. The following recurrence patterns are available in the **Periods Setup** tab: **Daily, Weekly, Monthly,** and **Yearly.** You can specify a start date, a start time, duration, and a "recur on" date for each period.

Daily Recurrence Pattern

The daily recurrence pattern allows you to set up a time block for a daily recurring period, as shown in Figure 6.5. Click on a new row to add a new daily recurring time block. To delete a time block, click inside the far left gray cell for that block to highlight the entire row, and then press the **Delete** key.

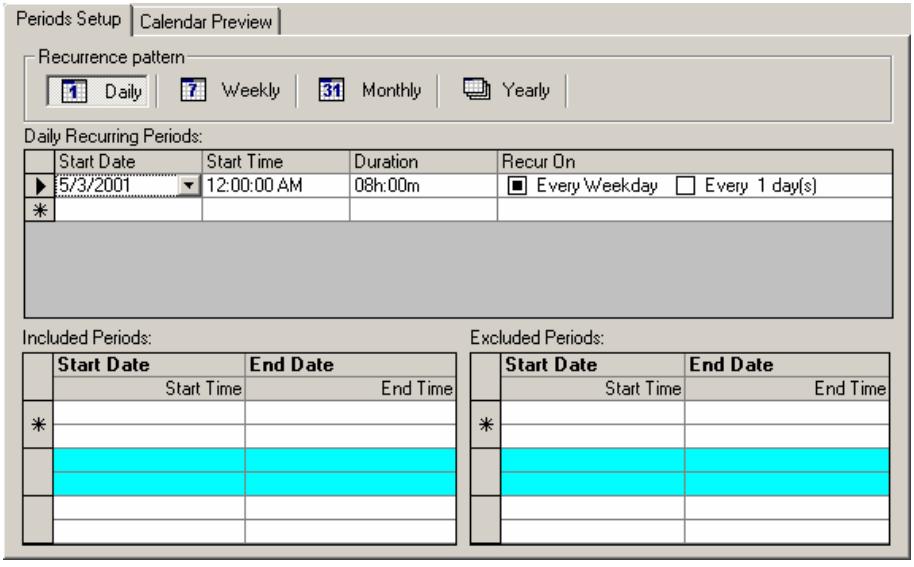


Figure 6.5. Periods Setup Tab

Start Date: The drop-down menu displays a calendar from which you can choose a start date, as shown in **Figure 6.6.**

Start Time: Type in the start time (followed by AM or PM) if your system is set up for 12-hour time, or just the time if your system is set up for 24-hour time.

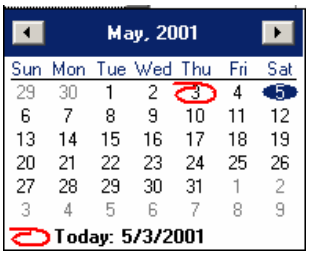


Figure 6.6. Calendar

Duration: Click on the **…** button to the right of the **Duration** field on the **Periods Setup** tab to choose the number of hours and/or minutes you wish to have the time block last, as shown in **Figure 6.7.**

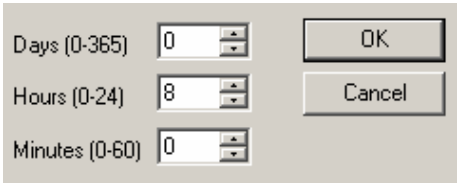


Figure 6.7. Duration Settings

Recur On: In this field, you can choose whether to have the period recur on every weekday or on every certain number of days. You can change the number of days by clicking on the far right side in the field to display a drop-down menu.

Weekly Recurrence Pattern

The weekly recurrence pattern allows you to set up a time block for a weekly recurring period. Click on a new row to add a new weekly recurring time block. To delete a time block, click inside the far left gray cell for that block to highlight the entire row, and then press the **Delete** key on the keyboard.

Start Date: The drop-down menu displays a calendar from which you can choose a start date, as shown in Figure 6.6.

Start Time: Type in the start time (followed by AM or PM) if your system is set up for 12-hour time, or just the time if your system is set up for 24-hour time.

Duration: Click on the **…** button to the right of this field to choose the number of days, hours, and/or minutes you wish to have the time block last, as shown in Figure 6.7.

Recur Every: The drop-down menu allows you to choose the number of weeks in which you wish have the time block recur. Check the day(s) on which you wish to have the time block recur.

Monthly Recurrence Pattern

The monthly recurrence pattern allows you to set up a time block for a monthly recurring period. Click on a new row to add a new monthly recurring time block. To delete a time block, click inside the far left gray cell for that block to highlight the entire row, and then press the **Delete** key.

Start Date: The drop-down menu displays a calendar from which you can choose a start date, as shown in Figure 6.6.

Start Time: Type in the start time (followed by AM or PM) if your system is set up for 12-hour time, or just the time if your system is set up for 24-hour time.

Duration: Click on the **…** button to choose the number of days, hours, and/or minutes you wish to have the time block last, as shown in Figure 6.7.

Recur On: Click on the **…** button to display a dialog box that will let you choose when to have the time block recur, as shown in **Figure 6.8.**

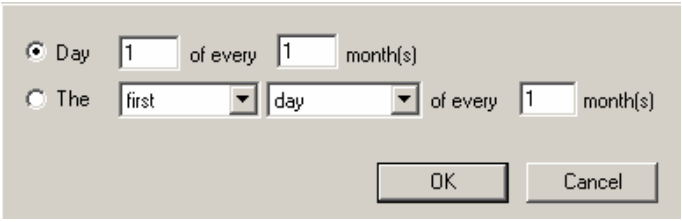


Figure 6.8. Settings for Monthly Recurring Period

Yearly Recurrence Pattern

The yearly recurrence pattern allows you to set up a time block for an annually recurring period. Click on a new row to add a new yearly recurring time block. To delete a time block, click inside the far left gray cell for that block to highlight the entire entry, and the press the **Delete** key.

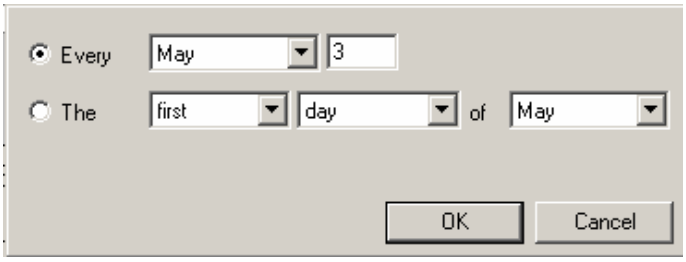


Figure 6.9. Settings for Yearly Recurring Period

Start Date: The drop-down menu displays a calendar from which you can choose a start date.

Start Time: Type in the start time (followed by AM or PM) if your system is set up for 12-hour time, or just the time if your system is set up for 24-hour time.

Duration: Click on the **…** button to choose the number of days, hours, and/or minutes you wish to have the time block last.

Recur Every: Click on the **…** button to display a dialog box that will let you choose when you wish to have the time block recur, as shown in **Figure 6.9.**

Included and Excluded Periods

The **Included Periods** and **Excluded Periods** fields on the **Periods Setup** tab allow you to include or exclude a particular block of time from a schedule. Click on a new row to add a new time block to include or exclude. The start date and time as well as the end date and time are shown for each included or excluded period. To delete a time block, click inside the far left gray cell for that block to highlight the entire entry, and then press the **Delete** key.

6.2.2 Calendar Preview

The **Calendar Preview** tab, shown in **Figure 6.10,** allows you to view your scheduled time blocks in a calendar layout. You can review various time spans by clicking the **Previous** and **Next** buttons. To change the time span, click the arrow next to the **Time Span to Preview** field, and select a time span from the drop-down list. You can choose from 2 months, 4 months, 6 months, 8 months, 10 months, or a year.

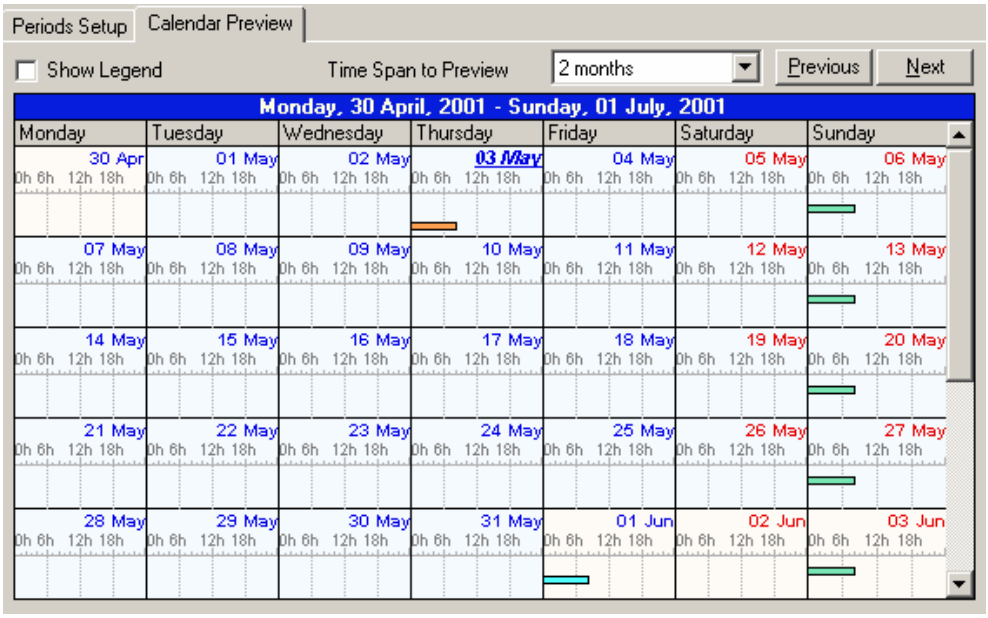


Figure 6.10. Calendar Preview Tab for Scheduling

Checking the **Show Legend** box will display a legend that indicates what each color represents, as shown in **Figure 6.11.**

Moving the cursor over a particular date will display a ToolTip with all time blocks set for that day.

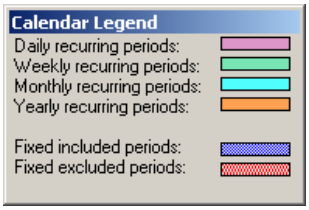


Figure 6.11. Calendar Legend

6.3 Working With Roles

Roles allow you to configure an alarm action set so that an alarm message will be sent to the person who is on schedule from a list of configured people. For example, if you want to call a shift supervisor when a certain alarm appears, you can set up a role called "Shift Supervisors." Then when the alarm occurs, the alarm message will be sent to whichever shift supervisor is on schedule.

If more than one person belongs to a role, alarm messages will be sent to all persons scheduled for the role. Recall that personal schedules (described earlier) allow for the configuration of one or more multimedia agents for each person in the role. If the people scheduled for the role use different multimedia agents, you can specify which multimedia agent will be used to notify each person. If multiple multimedia agents are configured for a single person in the role, you can also set a priority level to specify the "preferred" agent for that person.

6.3.1 Configuring Roles

To configure roles, use the following steps:

1. Right-click on the **Roles** folder in the tree control of the Multimedia Configurator screen, and select **New > Role** from the pop-up menu, as shown in **Figure 6.12.** The **Roles** folder is located under the **System Objects** folder on the tree control.

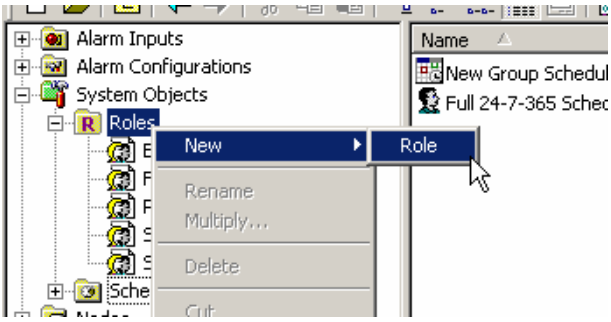


Figure 6.12. Creating a New Role

2. This opens the configuration field for roles in the right-hand pane of the Configurator screen. Type a name for the role, as shown in **Figure 6.13.**

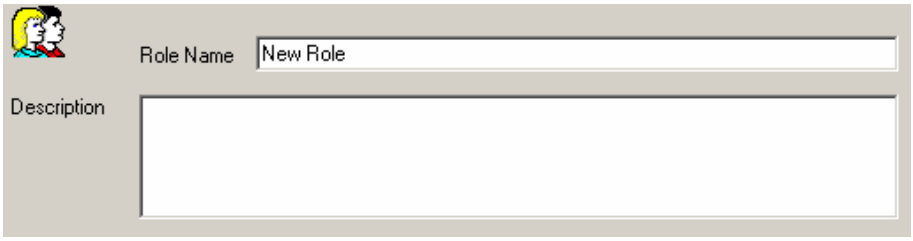


Figure 6.13. Configuring a New Role

3. Click the **Apply** button to apply your changes.

6.3.2 Using Roles

To use a role, you must do the following:

1. Assign the role to corresponding people in their personal schedules (see Figure 6.4).

2. Assign these personal schedules to multimedia agents. For information about configuring multimedia agents, please refer to **Chapter 4.**

3. Assign the role as an **Action Destination** in an alarm action set, if you want to send alarm messages to the role. For more information about configuring alarm action sets, please refer to **Chapter 2.**

Note: This is where you can set a priority level to determine which multimedia agent will be active if more than one is scheduled to occur.

Chapter 7

Additional Settings

7.1 Configuring Nodes

The Multimedia Configurator allows you to link alarm configurations to one or more nodes. Because the Multimedia Server uses a separate thread for each alarm configuration, you can also link multiple alarm configurations to each node.

To configure and link a node, use the following procedure:

1. Right-click on the **Nodes** folder in the tree control of the Configurator screen and select **New > Node** from the pop-up menu, as shown in **Figure 7.1.**

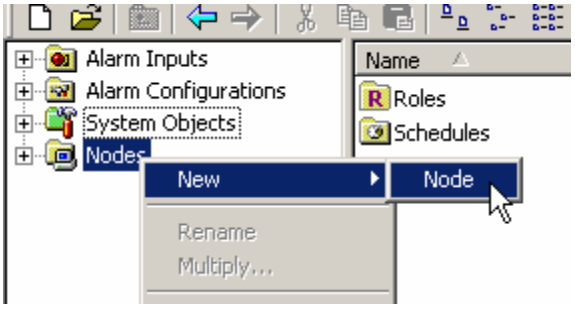


Figure 7.1. Creating a New Node

2. Give the new node a name, as shown in **Figure 7.2,** or click the **Browse** button to select a node.

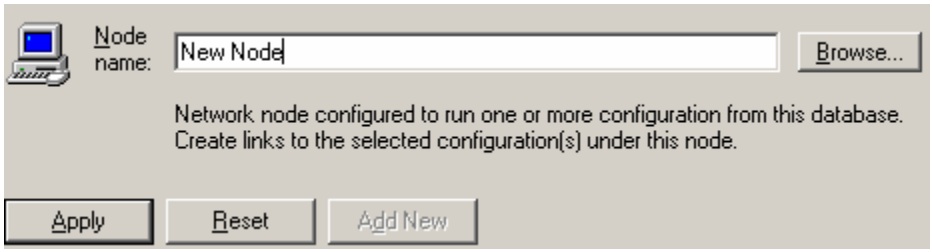


Figure 7.2. Specifying the Node Name

3. Click **Apply.** The new node will appear under the **Nodes** folder.

4. Now you can link one or more alarm configurations to the node by right-clicking the node and selecting **New > Link to Alarm Configuration** from the pop-up menu, as shown in **Figure 7.3.**

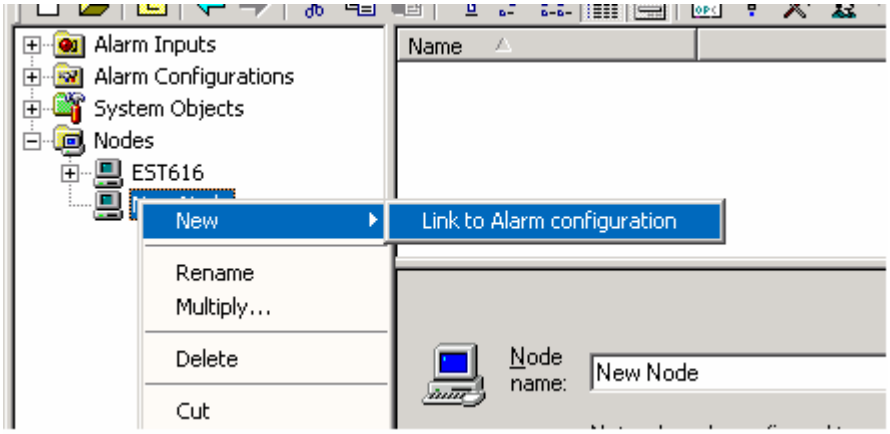


Figure 7.3. Creating a Link to an Alarm Configuration

5. Select the configuration from the drop-down list of configurations in the **Configuration Name** field, as shown in **Figure 7.4.** You can link one or more alarm configurations to a single node. The default alarm configuration is linked to the node automatically when no other configurations are linked to the node.

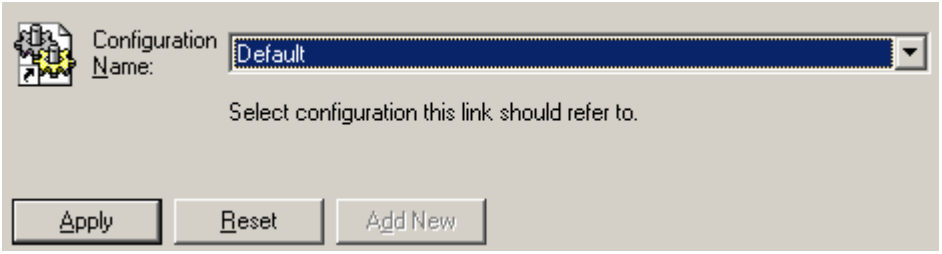


Figure 7.4. Linking a Node to an Alarm Configuration

7.2 Multiplying Items

The Multimedia Configurator is equipped with the ability to multiply items in the tree control, including templates, filters, schedules, action sets, agent configurations, and alarm configurations. Multiplication provides a simple way of developing alarm configurations for which there are many similar items in a given category. To multiply an item, first select the item you wish to multiply. Then either right-click the item and select **Multiply…** from the pop-up menu, or select **Multiply** from the **Edit** menu. This opens the **Multiply Item** dialog box, shown in **Figure 7.5.**

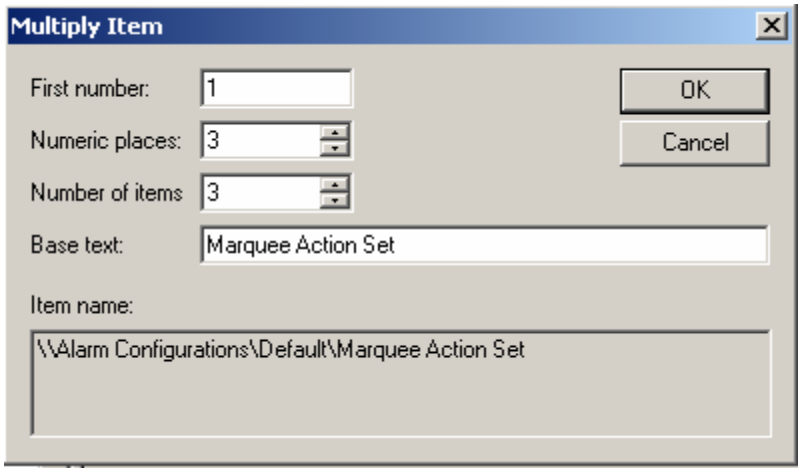


Figure 7.5. Multiplying an Item

When the items are multiplied, they will all be given a base name followed by a number. The default base text is the name of the item selected for multiplication. To modify the base text, change the **Base Text** field appropriately. In the **First Number** field, specify the number to appear next to the first multiplied item. In the **Number of Items** field, specify how many items you wish to create. The **Numeric Places** field refers to the minimum length of each number to append. Values that take up less space than the specified amount of numeric places will have zeros before the number. For example, the configuration shown in Figure 7.5 will create three new action sets with the following names:

- Marquee Action Set001
- Marquee Action Set002
- Marquee Action Set003

Click the **OK** button to do the multiplication.

7.3 Options

To choose additional settings, select **Options** from the **Tools** menu. This opens the **Options** dialog box, which contains the following tabs:

- General
- Table(s) Management
- Monitor View
- Multimedia Assistant

7.3.1 General Tab

The **General** tab of the **Options** dialog box, shown in **Figure 7.6,** contains the following options.

Save regional settings in registry: Checking this option saves regional configuration settings in the registry so that they are applied each time you start the Configurator. This applies to the language settings as well as time and date settings.

Automatically apply changes when selection is changed: Checking this option allows changes to the configuration database to be saved each time you switch dialogs without clicking on the **Apply** button or being shown a message asking if you would like to apply changes.

Enable hover selection: Checking this option allows you to highlight an item by moving the mouse pointer over that item and keeping it there for a specified amount of time.

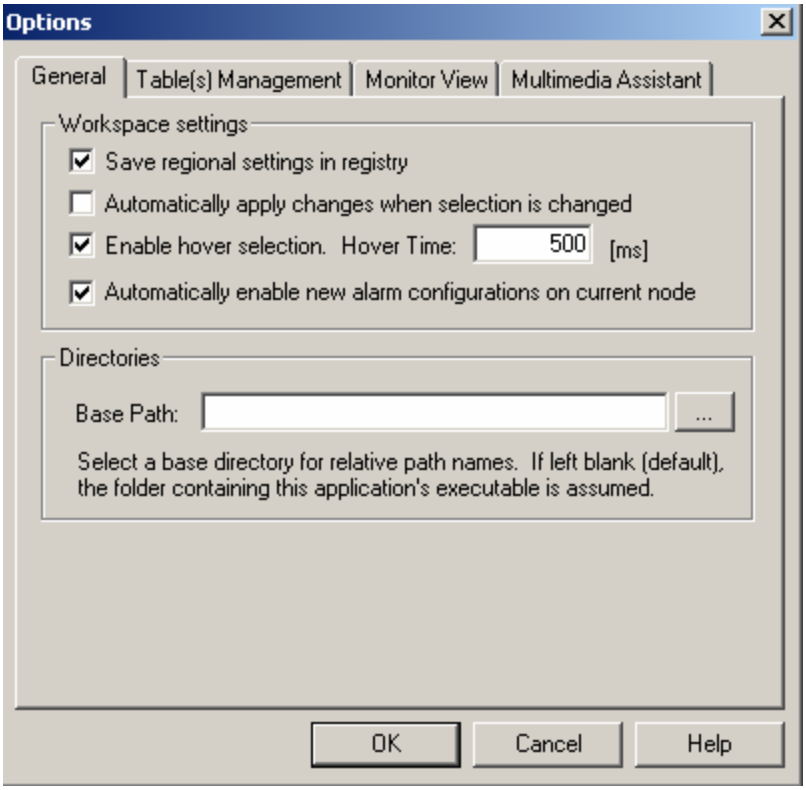


Figure 7.6. Options Dialog Box: General Tab

Automatically enable new alarm configurations on current node: If this option is checked, when a new alarm configuration is created the current node will be automatically added to the **Nodes** folder with a link to the alarm configuration.

Base Path: Select a base directory for relative path names. Click the **...** button to choose a directory. If this field is left blank (default), the folder containing this application's executable (.exe) file is assumed.

7.3.2 Table(s) Management Tab

The **Table(s) Management** tab of the **Options** dialog box, shown in **Figure 7.7,** controls how the Multimedia Server logs and stores data.

Multimedia Journal Table

Max Records: Sets the number of records that the Multimedia Server can store in the Journal Table before they are deleted or archived.

Max Interval: Sets the maximum amount of time that the records are stored in the Journal Table before being deleted or archived.

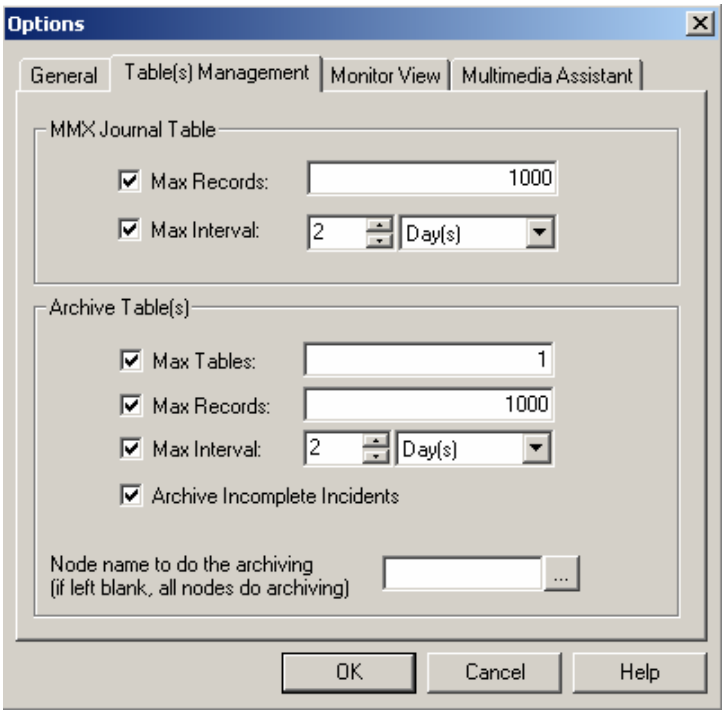


Figure 7.7. Options Dialog Box: Table(s) Management Tab

Archive Table(s)

Max Tables: Sets the number of tables to archive before deleting the oldest table.

Max Records: Sets the number of records to archive in a table.

Max Interval: Sets how long to archive for before deleting the oldest archive.

Archive Incomplete Incidents: When this box is checked, the Multimedia Server will log incidents or events to an archive table even if they have not yet been resolved.

Node name to do the archiving: Choose a node for archiving records. Click the **...** button to select a node. The **Browse for Computer** dialog box will open, as shown in **Figure 7.8.** Choose the desired node, and then click **OK.**

Note: If you would like Journal Table records to be deleted and not archived, check **Max Tables** and set the field to "0."

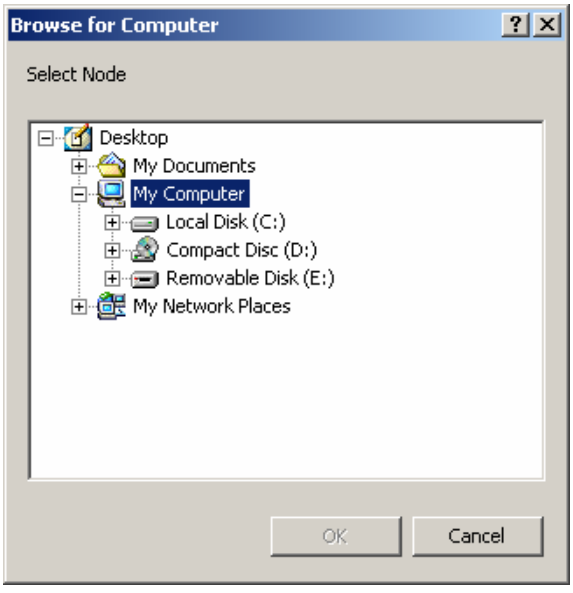


Figure 7.8. Choosing a Node for Archiving

7.3.3 Monitor View Tab

The **Monitor View** tab of the **Options** dialog box, shown in **Figure 7.9,** allows you to configure the settings for the **Runtime Monitor.** You have the option to:

- Select an **Update Rate** (in milliseconds).
- Limit the number of records displayed.
- Choose which fields are shown in the Runtime Monitor, as well as the order in which they are shown. To change the display order of a particular field, click on the field in the list box under **Show Fields** and then click the "up" and "down" arrows to the right to adjust its position.

Note: For more information about the Runtime Monitor, please see **Chapter 8.**

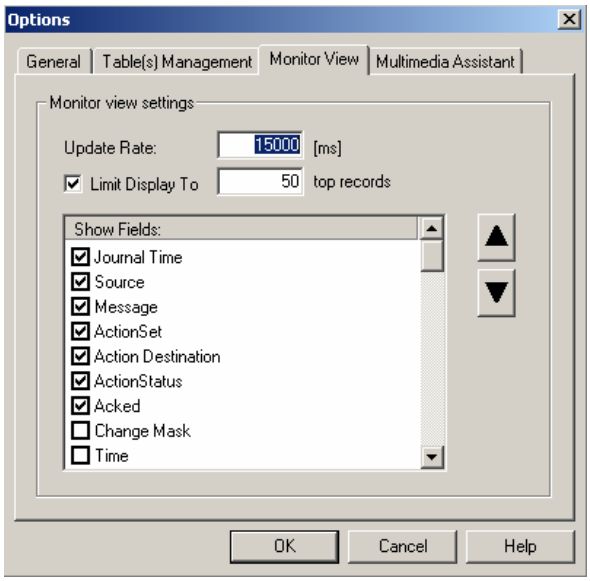


Figure 7.9. Options Dialog Box: Monitor View Tab

7.3.4 Multimedia Assistant Tab

For additional help, you can consult the Multimedia Assistant at any time by selecting **Multimedia Assistant** from the **Help** menu. Follow the instructions provided by the Multimedia Assistant.

In the **Multimedia Assistant** tab of the **Options** dialog box, shown in **Figure 7.10,** you can choose whether you want the Multimedia Assistant to speak or only to show text instructions.

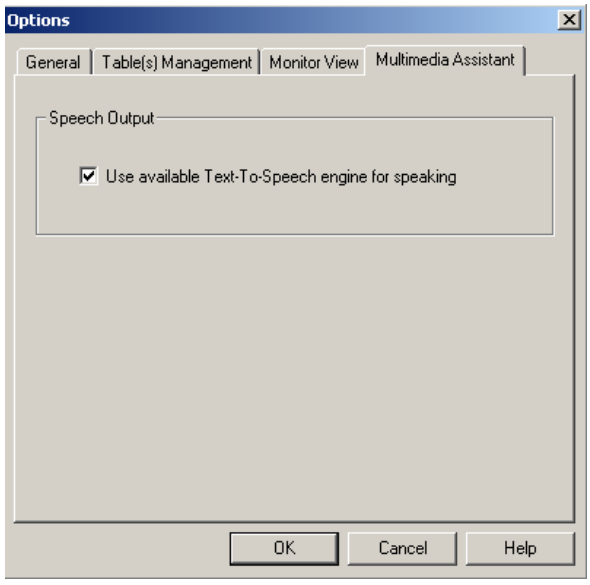


Figure 7.10. Options Dialog Box: Multimedia Assistant Tab

Chapter 8

Runtime Operations

8.1 Starting the Multimedia Server

The majority of this user's guide is devoted to the configuration of alarms, alarm action sets, alarm filters, OPC subscriptions, multimedia agents, media templates, acknowledgement codes, schedules, roles, and nodes using the Multimedia Configurator. All of your configuration data are stored in your configuration database.

Once you have completed the configuration of your database, you are now ready to connect the Multimedia Server to the database by starting the Multimedia Server. Before starting the Multimedia Server, be sure to test your multimedia agent configurations by using the **TEST** button in the configuration field for each agent. To enter the Multimedia Server into runtime mode, select **Start Multimedia Server** from the **Action** menu. The following events occur when you activate the Multimedia Server:

1. The Multimedia Server reads all the alarm configurations in the multimedia configuration database.
2. The Multimedia Server then subscribes to OPC Alarm and Events (AE) servers based on the subscriptions that you created in the configuration database.
3. In turn, the OPC AE servers generate alarms back to the Multimedia Server.
4. When the Multimedia Server receives alarms, it responds to those alarms according to the settings and alarm action sets that you configured in your database.
5. Based on these action sets, the notification messages are then sent to a recipient (an operator or a group) via the configured multimedia agents.
6. The recipient of the alarm message can then acknowledge the alarms using the configured multimedia device by entering an acknowledge code.

8.2 Runtime Monitor

When you start the Multimedia Server, you should verify that the server is connected to the configuration database. Use the Multimedia **Runtime Monitor,** shown in **Figure 8.1,** to determine whether a connection has been established. The Runtime Monitor enables you to view the activity of the Multimedia Server during runtime mode. To display the monitor, select **Monitor View** from the **View** menu. The monitor will be displayed at the bottom of the screen. Check the monitor to make sure the Multimedia Server is receiving alarms.

The monitor lets you know what is going on in an active database and how the Multimedia Server is processing the alarms and the multimedia agents that you have configured. By default, the monitor displays the Time, Source, Message, Action Set, Action Destination, Action Status, and alarm acknowledgment status for the selected actions and alarms. You can choose which action sets and alarms to monitor by selecting from the **Action Set to Monitor** and **Alarm Tags** drop-down lists, respectively. Each incident for a particular agent is grouped by color.

The **Alarm Status** conditions are:

- **Alarm:** The Multimedia Server has received an alarm from the alarm OPC server.
- **Agent Done:** The multimedia agent has successfully processed the request but has not completed the action.
- **Normal:** The alarm has returned to normal.

Note: For information about how to change the Runtime Monitor display settings, see the next section.

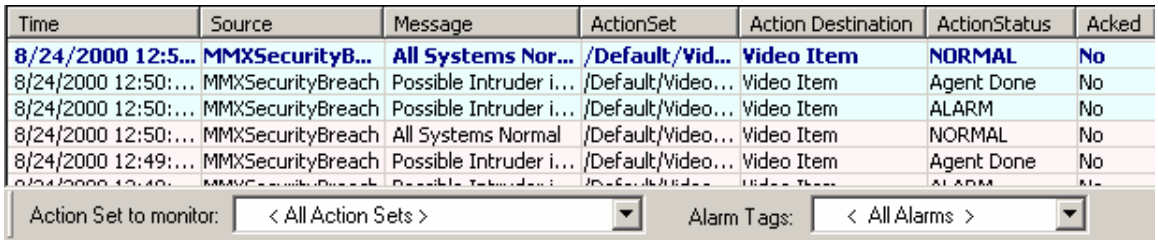


Figure 8.1. Runtime Monitor

There are three buttons in the runtime monitor, as shown in **Figure 8.2:**

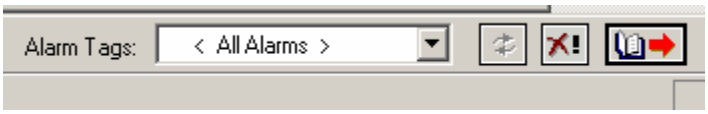


Figure 8.2. Function Buttons for Runtime Monitor

Refresh: Manually refreshes the journal table (besides the automatic refresh specified in the **Monitor View** tab of the **Options** dialog box).

Delete: Deletes all records from the journal table (only if the Multimedia Server is not running).

Export: Exports the data in the journal table to a text file. Clicking this button opens the **Export Multimedia Journal** dialog box, as shown in **Figure 8.3.** In the **Export File Name** field, specify the directory path and file name for the text file. Click the **...** button to browse for a directory. You can also choose to export archived journal data.

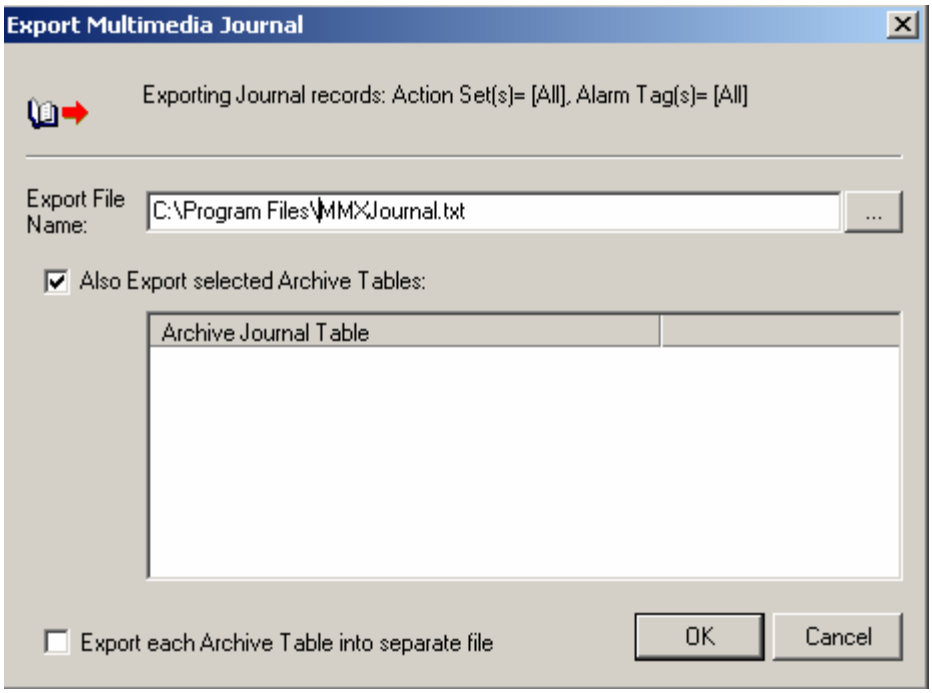


Figure 8.3. Exporting Data to a Text File

8.2.1 Adjusting Runtime Monitor Settings

You can adjust the settings for the Runtime Monitor by selecting **Options** from the **Tools** menu. This opens the **Options** dialog box. The **Monitor View** tab of the **Options** dialog box, shown in **Figure 8.4,** configures the settings for the Runtime Monitor. You have the option to:

- Select an **Update Rate** (in milliseconds) to determine how often the Multimedia Server will update the data that appear in the Runtime Monitor journal table.
- Set a maximum number of records to be displayed in the Runtime Monitor.
- Choose which fields are shown in the Runtime Monitor, as well as the order in which they are shown. To change the display order of a particular field, click on the field in the list box under **Show Fields** and then click the "up" and "down" arrows to the right to adjust its position.

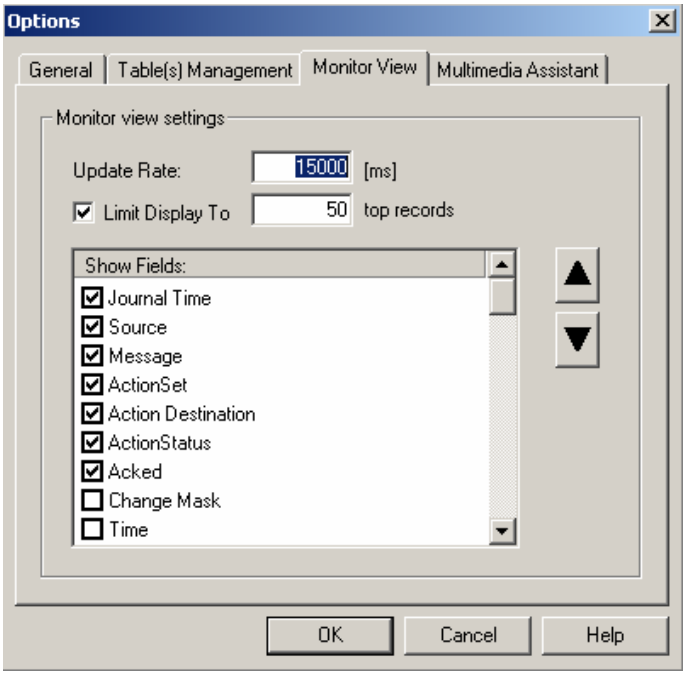


Figure 8.4. Options Dialog Box: Monitor View Tab

8.3 Table Management

You can adjust the Journal data-logging settings for the Multimedia Server by selecting **Options** from the **Tools** menu. This opens the **Options** dialog box. The **Table(s) Management** tab of the **Options** dialog box, shown in **Figure 8.4,** allows you control how the Multimedia Server logs data to the journal and archive tables.

Multimedia Journal Table

Max Records: Sets the number of records that the Multimedia Server can store in the Journal Table before they are deleted or archived.

Max Interval: Sets the maximum amount of time that the records are stored in the Journal Table before being deleted or archived.

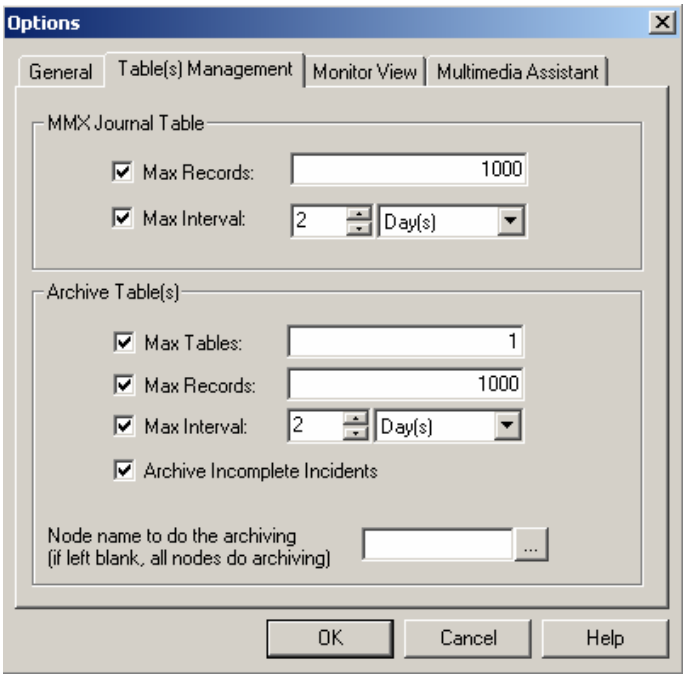


Figure 8.4. Options Dialog Box: Table(s) Management Tab

Archive Table(s)

Max Tables: Sets the number of tables to archive before deleting the oldest table.

Max Records: Sets the number of records to archive in a table.

Max Interval: Sets how long to archive for before deleting the oldest archive.

Archive Incomplete Incidents: When this box is checked, the Multimedia Server will log incidents or events to an archive table even if they have not yet been resolved.

Node name to do the archiving: Choose a node for archiving records. Click the **...** button to select a node. Choose the desired node, and then click **OK.**

Note: If you would like Journal Table records to be deleted and not archived, check **Max Tables** and set the field to "0."

8.4 Stopping the Multimedia Server

You can stop the Multimedia Server at any time by selecting **Stop Multimedia Server** from the **Action** menu of the Multimedia Configurator. This exits runtime mode. You can also click the traffic light button on the toolbar.

Note: You can also start/stop the Multimedia using the ProcViewTray tool tray. For more information, please see the ProcViewTray Help documentation.

IMPORTANT NOTE: Once the Multimedia Server has been stopped, alarm messages will stop being issued to the alarm action destinations.

Chapter 9

Call-in Agent Configuration

9.1 Overview of the Call-in Agent

The **Call-in Agent** enables users to access OPC data over the phone. The Call-in Agent configuration sets up the voice and key entries and menu options based on information supplied from the Multimedia configuration database, the current state of OPC data or alarms, and the security level of the user calling into the system.

Note: The following Configurator features do NOT apply to the Call-in Agent: the Multimedia Configuration Wizard, action sets, and schedules.

9.1.1 Call-in Agent Quick Start

Configuring and using the AlarmWorX Multimedia Call-in Agent require the following steps:

1. Install the Dialogic hardware. (See **Appendix B** for information about installing and configuring Intel Dialogic boards. For additional information about purchasing and installing Intel Dialogic boards, please visit the Intel Web site at www.intel.com/network/csp/products/index_vp.htm.
2. Install the Dialogic drivers. (At the time of this writing, these drivers must be Dialogic version 5.1 with Service Pack 1.)
3. Install the AlarmWorX Multimedia software.
4. Configure the Dialogic card. During initial setup, it is recommended that the **Dialogic Configuration Manager (DCM)** be used for configuring and running the Dialogic drivers. (See the "Installing and Configuring Telephony Cards" section of **Appendix B.**) Open the DCM and select the **Action** menu. If you are familiar with the card, use the **Add Device** option, or have the DCM detect the card using the **Auto Detect Devices** option.
5. Start the Dialogic drivers. Highlight the configured Dialogic card from the graphical tree menu. Start the drivers by clicking the green start button. If the drivers fail to initialize the card, check the card type and settings. If problem persists, contact Dialogic for technical support.
6. Plug an analog phone line into the primary channel (zero channel). At this time, you should verify that the phone number is correct, that the phone line is analog, and that it is a dedicated line. It is also a good idea to verify a phone number to call out to. (**Note:** Digital phone lines are not supported.)
7. Launch the Multimedia Configurator by selecting **Start > Programs > Smar ProcessView > AlarmWorX Multimedia > Multimedia Configurator.** Click on the **Phone** folder on the tree control of the Configurator under **Alarm Configurations/Multimedia Agents.** For the **Phone Agent General Settings** (see the "Setting General Phone Agent Parameters" section below), set the number of phone lines to "1." Make sure that phone line "0" is not reserved for outgoing calls.
8. Configure the Call-in Agent settings as described in **Section 9.4** below.
9. Enter the Call-in Agent into runtime mode by clicking the **Start Call-in Agent** button on the Call-in Agent's general settings.
10. Call the number of the phone line attached to the Dialogic card.

9.1.2 Tips and Troubleshooting

1. Check to make sure the phone line is securely attached to the zero channel. Dialogic boards support multiple channels, and it is relatively easy to connect the phone line to one of the other channels.
2. It is best to try an analog phone for first time calling. There have been issues with the Dialogic card not detecting phone keys when using digital phones in speaker mode.
3. Operation within a PBX (internal phone system) is dependent on the manner in which the PBX handles calls. A common example is where the phone seems to connect in the middle of the Multimedia messages. This is caused by a delay in connection. The PBX has taken the phone connected to the agent off the hook, thus starting the message, but has not connected the caller. A workaround for this is to add commas to the beginning of the message. In general, any PBX issue will be experienced by the Call-in Agent as if it were a normal user.
4. Make sure that the channel being tested for the Call-in Agent is not being reserved for call-out. The Call-in Agent prevents incoming calls from being used on lines reserved for outgoing calls.
5. Make sure that the number of lines does not exceed the number of working physical phone lines connected to the Dialogic card. The system uses the **Number of Lines** setting as an indication of the actual phone lines available. Setting this number higher than the number that actually exists causes the system to periodically use the lines that do not exist.

9.2 Setting General Telephony Agent Parameters

Before you begin configuring the Call-in Agent, you must first set up the default parameters for the Call-in Agent. Click on the **Phone** folder on the tree control of the Configurator, as shown in **Figure 9.1.** If you do not see the **General Settings,** make sure that **Dialog View** is checked on the **View** menu. Configure the default settings as described below.

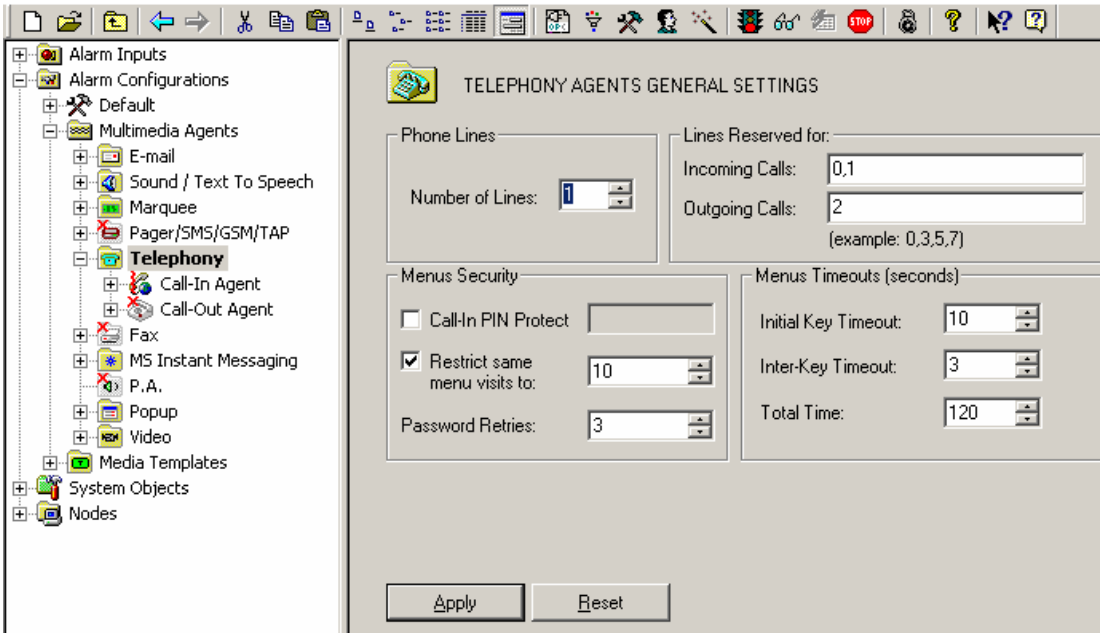


Figure 9.1. Telephony Agents: General Settings

9.2.1 Phone Lines

Configure the following parameters for the phone lines you will be using for the Call-in Agent:

- **Number of Lines:** Sets the total number of phone lines that will be used.

  Note: The number of lines specified must be less than or equal to the actual number of phone lines that will be used. If the number of lines specified in the Configurator is greater than the actual number of lines in use, the Call-in Server works under the assumption that additional phone lines are available even though the lines do not actually exist. Although up to 20 lines are supported, number of lines that can be used is limited by the type of Dialogic board. The Call-in Agent only supports communication with one Dialogic card per PC. See **Appendix B** for details.

  Note: The Telephony Agents currently support up to 20 phone lines. However, the agent has been tested with a maximum of four phone lines.

- **Incoming Calls:** Specifies which phone lines are reserved for incoming calls.

- **Outgoing Calls:** Specifies which phone lines are reserved for outgoing calls.

  Note: When specifying which phone lines are reserved for incoming and outgoing calls, the first line is always line "0". For example, suppose you are using a total of three lines, as shown in Figure 9.1. The first line is "0", the second line is "1", and the third line is "2". Since the first and second lines are used for incoming calls, enter "0" and "1" in the **Incoming Calls** field, as shown in Figure 9.1. The third line is used for outgoing calls, so enter "2" in the **Outgoing Calls** field, as shown in Figure 9.1.

  Any phone lines that are not reserved are used as general purpose lines (i.e. for either incoming or outgoing calls

  Note: If you are using only one telephone line, you cannot reserve the single line for both incoming and outgoing calls. Therefore, to configure a single-line system, both the **Incoming Calls** field and the **Outgoing Calls** field should be left blank.

9.2.2 Menus Security and Timeouts

Configure the following security and timeout parameters for the Call-in menus.

- **Call-in PIN Protect:** Specify a numeric password or PIN that users must enter prior to each menu in order to progress through the phone menus in the Call-in Agent.

  Note: This is different from the general security settings used for logging into the phone system. (The login settings are configured in the Call-in Agent tree control branch.)
- **Restrict same menu visits to:** Limits the number of times a user can access the same menu through the Call-in Agent. This limits the overall time users can remain in the phone system to prevent users from tying up the phone lines.
- **Password Retries:** Sets the number of times a user is allowed to enter an incorrect password on the phone keypad.
- **Initial Key Timeout:** Sets the number of seconds the phone waits for a key press before retry.
- **Inter-Key Timeout:** Sets the number of seconds allowed between key presses on the phone keypad before ending caller input.
- **Total Time:** Sets the total consecutive time (in seconds) that a caller may spend in the same menu before timeout. This includes the time the system uses to process and deliver the text-to-speech messages to the caller.

9.2.3 Dialogic Configuration

You must have a telephony card installed on the computer on which you are running the Call-in Agent. AlarmWorX Multimedia supports Intel® Dialogic® boards. You also need to have an analog phone line connected to the board. **Dialogic boards do not work for Windows 98, so the Call-in Agent will not work on Windows 98.** (**Note:** Digital lines are also not supported.) Only Dialogic boards are supported for the current version of AlarmWorX Multimedia. Please see **Appendix B** for information about installing and configuring Intel Dialogic boards. For more information about purchasing and installing Intel Dialogic boards, please go to www.intel.com/network/csp/products/index_vp.htm.

9.3 Organization of Call-in Agent Groups and Menus

Click on the **Call-in Agent** folder under the **Telephony** tree control of the Configurator, as shown in **Figure 9.2.** This folder contains the configuration user interface for all call-in menus, which enable you to configure the options, key entries, and actions for the Call-in Agent.

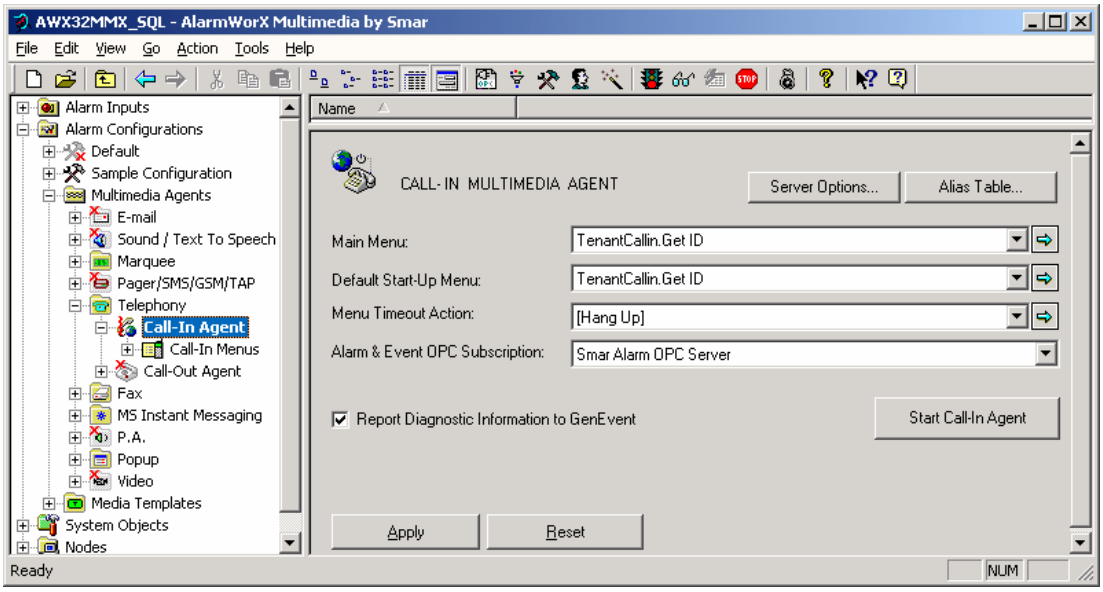


Figure 9.2. Call-in Agent Tree Control

The **Call-in Menus** branch of the tree control contains both menu groups and individual menus, as shown in **Figure 9.3.** For information about various menu types, please see **Section 9.6.**

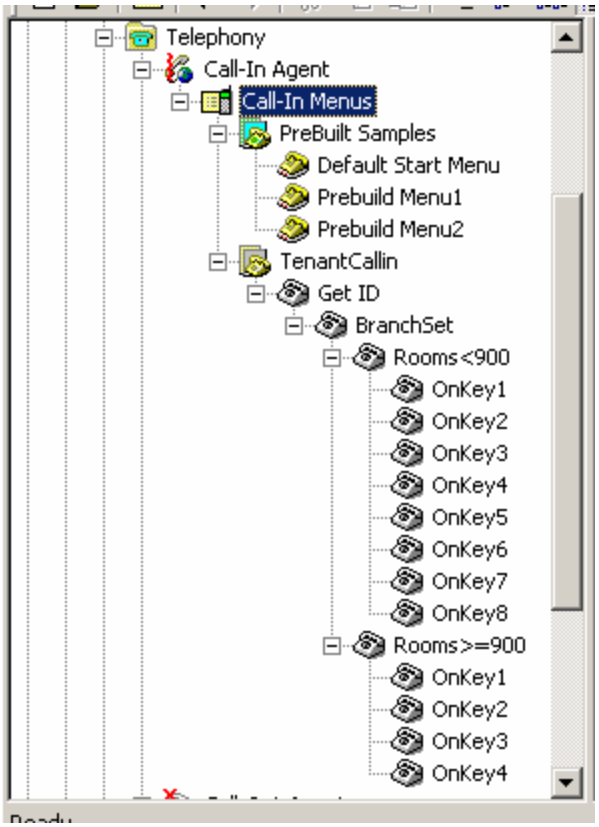


Figure 9.3. Hierarchy of Call-in Agent Tree Control

Two menu groups, shown in **Figure 9.4,** are provided by default to help you get started with your configuration. The **Prebuilt Samples** group contains preconfigured menus that you can use as templates for starting your Call-in Agent configuration. The **Tenant Callin** group is an example group that contains several fully configured example menus and submenus that you can use as a guide in creating your Call-in Agent configurations for tenant call-in applications for office rooms.

Configurator assigns an ID number for each group in the **Base Menu ID** field. Each of the menus that you create for the group is also assigned an ID number based on the Base ID for the group. Menu IDs can be used as key-in actions for key-in menus (described in **Section 9.6**).

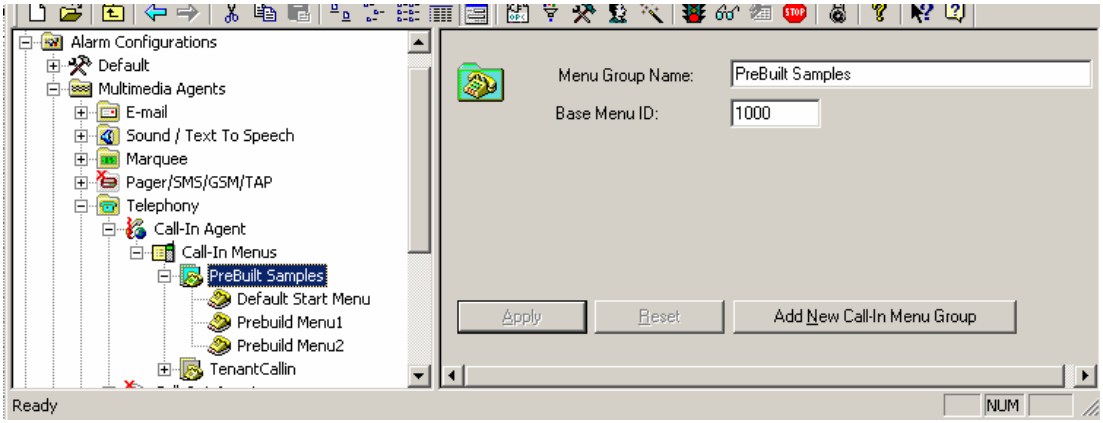


Figure 9.4. Default Call-in Menu Groups

Each group may contain several Call-in menus and submenus, as shown in **Figure 9.5.** The menus are organized hierarchically, similar to the way directories and files are organized on your computer's hard drive. For information about various menu types, please see **Section 9.6.**

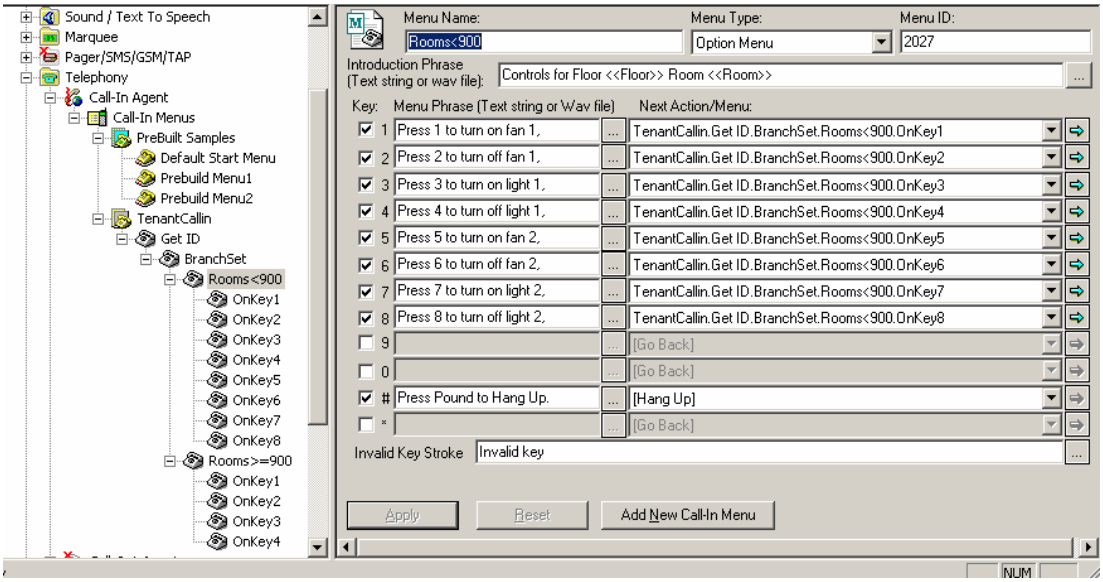


Figure 9.5. Default Call-in Menus

9.3.1 Modifying and Copying Groups and Menus

To save time, you can modify the default groups and menus and tailor them to your configuration. If you do not want to change the default groups and menus, you can also make a copy of them:

1. Right-click on a group or menu and select **Copy** from the pop-up menu, as shown in **Figure 9.6.**

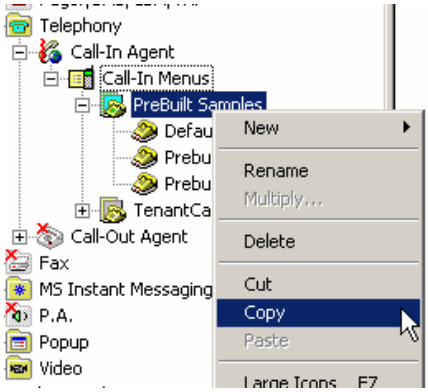


Figure 9.6. Copying a Group or Menu

2. Right-click the target folder and select **Paste** from the pop-up menu, as shown in **Figure 9.7.**

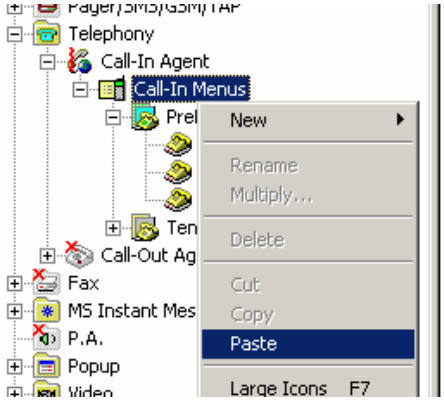


Figure 9.7. Pasting a Group or Menu

3. The copy of the group or menu appears under the target folder, as shown in **Figure 9.8.** Rename the group or menu as desired.

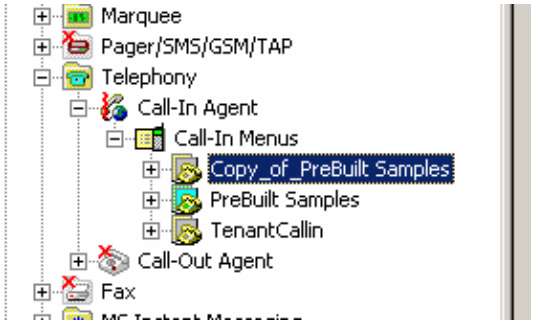


Figure 9.8. Copy of Group or Menu

9.3.2 Creating New Menu Groups

To create a new Call-in menu group:

1. Right-click the **Call-in Menus** folder on the tree control of the Configurator and select **New > Call-in Menu Group,** as shown in **Figure 9.9.**

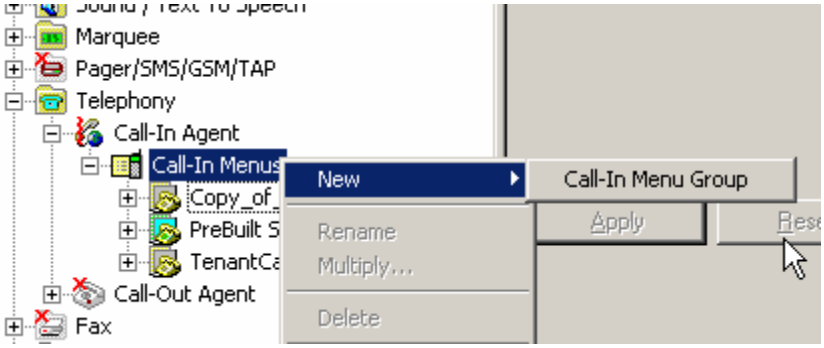


Figure 9.9. Creating a New Call-in Menu Group

2. The properties dialog box for the new group appears in the right-hand pane of the Configurator, as shown in **Figure 9.10.**

Figure 9.10. Setting the Properties for the New Call-in Menu Group

3. In the **Menu Group Name** field, type a name for the new group. The Configurator assigns an ID number for the group in the **Base Menu ID** field. Each of the menus that you create for the group is also assigned an ID number based on the Base ID for the group. Menu IDs can be used as key-in actions for key-in menus (described in **Section 9.6**).

9.3.3 Creating New Call-in Menus

To create a new Call-in menu:

1. Right-click a group in the **Call-in Menus** folder on the tree control of the Configurator and select **New > Call-in Menu,** as shown in **Figure 9.11.**

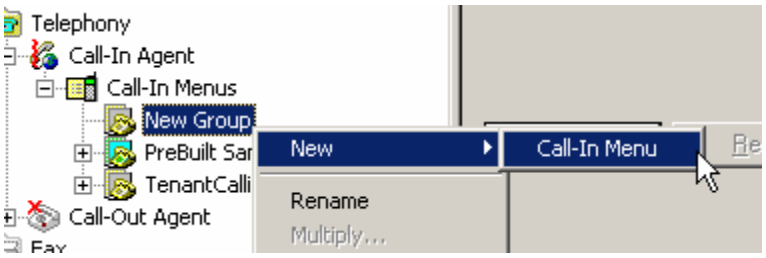


Figure 9.11. Creating a New Call-in Menu

2. The properties dialog box for the new menu appears in the right-hand pane of the Configurator, as shown in **Figure 9.12.**

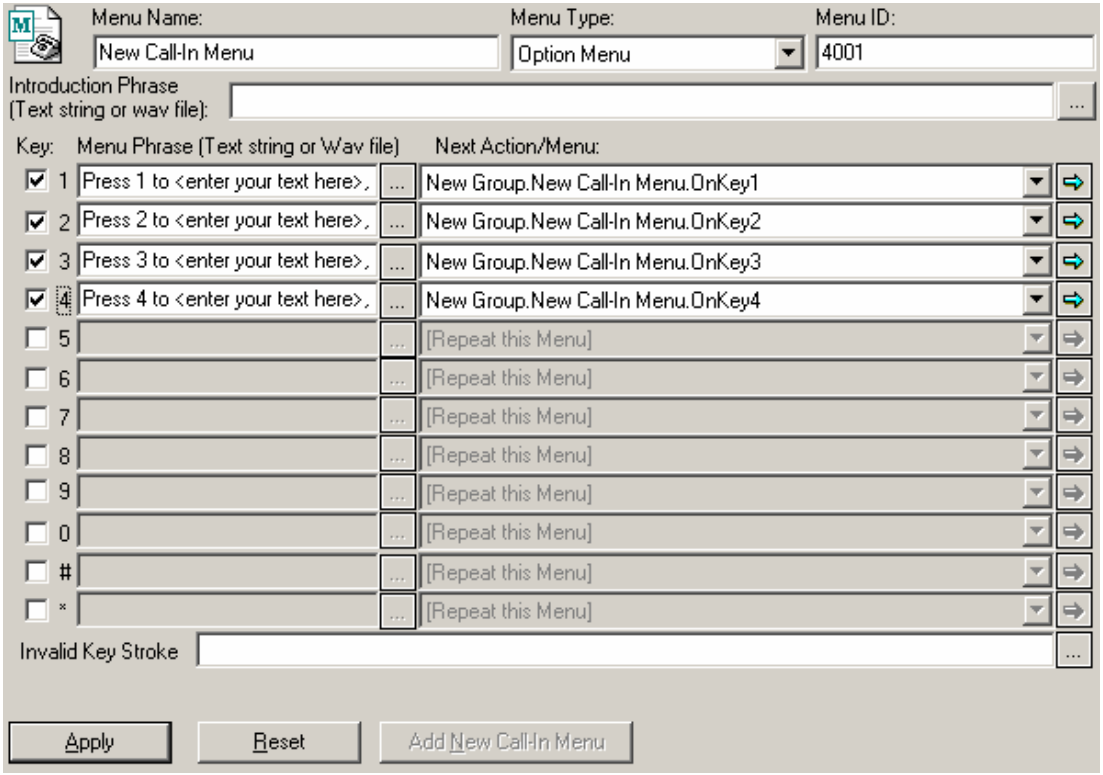


Figure 9.12. Setting the Properties for the New Call-in Menu

3. In the **Menu Name** field, type a name for the new menu. The Configurator assigns an ID number for the menu in the **Menu ID** field based on the Base ID number of the group in which the menu was created.
4. Configure the menu settings as described in the sections below.

9.4 Configuring General Call-in Agent Settings

Once you have set the default parameters for the Phone Agents, you are ready to begin configuring the Call-in Agent settings. Click on the **Call-in Agent** folder under the **Phone** tree control of the Configurator, as shown in **Figure 9.13.**

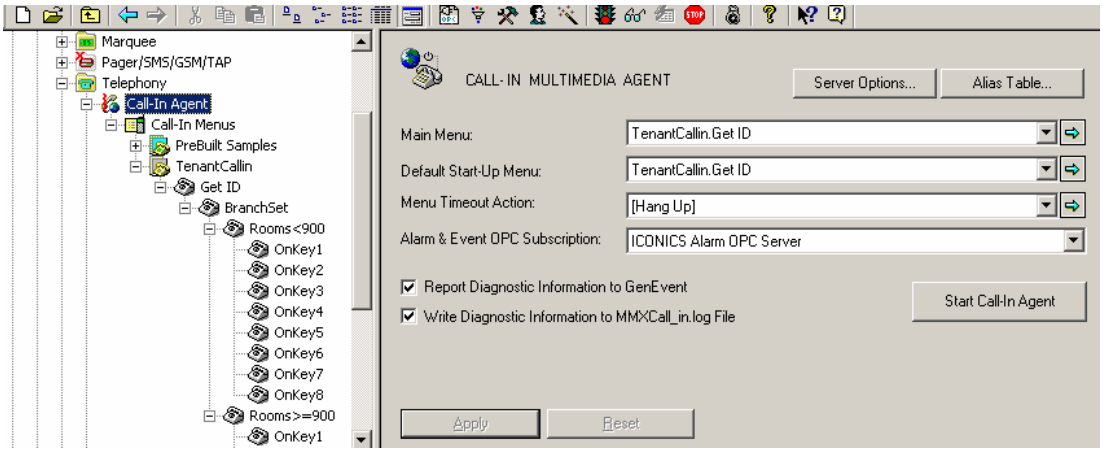


Figure 9.13. Call-in Agent General Settings

This folder contains the main configuration settings for the Call-in Agent.

1. Under **Main Menu,** select a menu from the drop-down list that you want to use as the main menu for your Call-in system. This is the menu to which callers are returned by default.
2. Under **Default Start-up Menu,** select a menu from the drop-down list that you want to use as the start menu for your Call-in Agent. The default start-up menu will most likely be the same as your main menu.

   Note: The drop-down lists under **Main Menu** and **Default Start-up Menu** contain only the top-level menus for each menu group.
3. Under **Menu Timeout Action,** specify what happens after a system timeout occurs. From the drop-down list, select an action (e.g. "repeat," "return to main menu," or "hang up") or a menu that immediately follows a timeout. For example, if a caller does not respond within the initial key timeout period, the system times out and then redirects the caller to the menu or action that you specified.
4. The report **Diagnostic information to GenEvent** check box is checked by default. All diagnostic information is reported to the GenEvent Server. This information can be viewed in the current alarm viewer, and provides a visual record of actions taken by the Call-in Agent.
5. If you want to log diagnostic information to a text file, check the **Write Diagnostic Information to MMXCall_in.log file** check box. The MMXCall_in.log file is a standalone file used for debugging purposes only.
6. The **Alarm & Event OPC Subscription** drop-down box allows you to select an alarm subscription to be used by the Call-in Agent while presenting OPC alarms.

9.4.1 Server Options

Clicking the **Server Options** button in the Call-in Agent general settings (Figure 9.13) opens the **Call-in Agent Options** dialog box, shown in **Figure 9.14.** This dialog box sets the parameters for the Call-in Server.

9.4.1.1 Server Strings Tab

The **Server Strings** tab allows you to customize predefined messages that the caller hears in certain situations. Use the **Call-In Agent's Message Type** drop-down list to select a particular message type, and then edit the text associated with that message type in the **Message Text** field. Figure 9.14, for example, contains a message that a caller hears when the caller is denied access to a menu: "Insufficient security to access this menu."

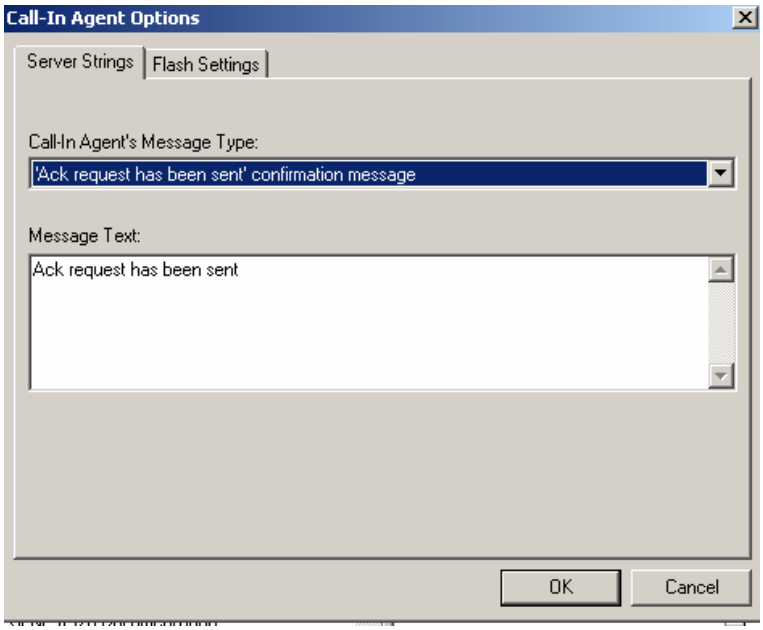


Figure 9.14. Server Strings

9.4.1.2 Flash Settings Tab

The **Flash Settings** tab sets the parameters for the **Flash Warning** function in direct action menus, where you can optionally specify a reset value. The reset value is written to the same OPC tag after the specified time interval, resetting the OPC value written by the menu action. When the **Flash Warning** check box is checked in a direct action menu, the system switches, or "flashes", the OPC tag between the tag's current (write) value and its reset value before finally resetting the tag value.

The **Flash Settings** tab, shown in **Figure 9.15,** sets the following parameters for the Flash Warning function in direct action menus:

Lead Time: Sets the amount of time before the system starts the flash process. The time is determined by taking the **Reset Time** (found on Direct Action menus) and subtracting the **Lead Time.** For example, if the **Reset Time** is 1 hour and the **Lead Time** is 10 minutes, the flash process will start 10 minutes before the final reset (in this case, 50 minutes after the value was originally set).

Time on: Sets the time period for each warning flash for the write value.

Time off: Sets the time period for each warning flash for the reset value.

Number of Flashes: Specifies how many times the system switches (flashes) between the tag's write value and reset value before resetting the value.

For each setting, you can specify how many minutes, seconds, and milliseconds.

Note: For information about configuring direct action menus, please see the "Menu Types" section below.

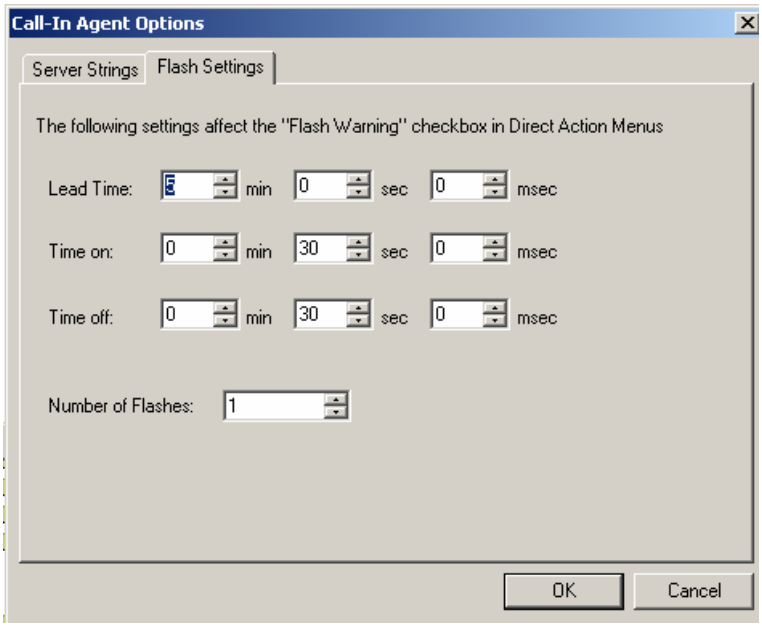


Figure 9.15. Flash Settings for Direct Action Menus

9.4.2 Aliases

The Call-in Agent can be configured to use an **alias key** for each user (caller). If using aliases, each caller uses a numeric alias key in the configuration. This is an ID number that the Call-in Agent uses to recognize the caller. Each alias key can be associated with numerous aliases, enabling you to customize settings for each user by associating the caller's alias key with certain parameters, such as which locations in the building the caller can access (e.g. room, floor). Alias names then can be used in Call-In menus to significantly reduce the number of necessary menus.

When a caller dials into the system, the caller can be prompted to enter his or her alias key. If he or she then accesses a menu containing aliases, all aliases get resolved according to the caller's alias key, and the caller gets control over OPC resources determined by his or her alias resolution. If another caller accesses the same menu with a different alias key, he or she would have access to yet another set of OPC points, as specified by his or her alias key in the alias table.

To configure aliases, click the **Alias Table** button in the Call-in Agent general settings (Figure 9.13). The **Call-in Alias Table** appears, as shown in **Figure 9.16.** The table contains several columns. The **Alias Key** column lists each numeric alias key. The **UserName** column lists the name of the caller associated with each alias key. The **Alias Key** column and **UserName** column are fixed; neither can be deleted, and each alias key must be associated with a user name. (You can change the keys and user names in the columns, but the columns themselves cannot be deleted.) The remaining columns contain aliases (e.g. **Bldg, Floor,** and **Room**) that can be modified or removed as needed.

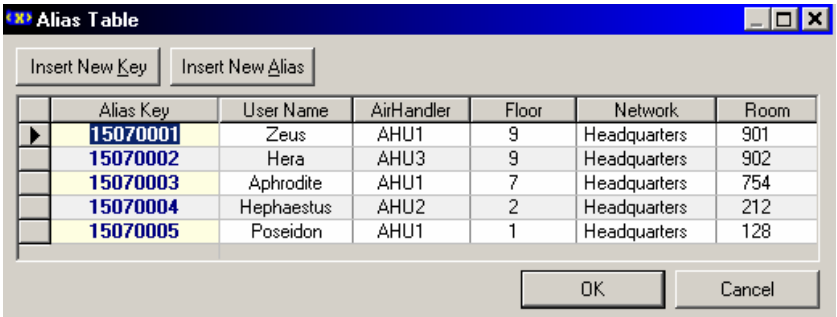


Figure 9.16. Alias Table

9.4.2.1 Alias Key-in Actions

A **Key-in menu,** such as the **Get ID** menu shown in **Figure 9.17,** is an example of when a caller would be asked to enter an alias key. The **Enter Alias Key to Resolve Aliases** option must be selected from the drop-down list under **Key-in Action,** as shown in Figure 9.17. For example, in the **GetID** key-in menu, the **Introduction Phrase** states "please enter your 8 digit ID." Thus, when a caller dials into the system, the caller is prompted to enter his or her alias key. If the system recognizes the caller's alias key, it resolves the user name and all other aliases associated with the alias key. For more information about configuring key-in menus, please see **Section 9.6.**

Note: The Call-in Agent supports both alias login and the standard security login. The alias login uses the **UserName** alias column to log a caller into the agent. This only takes place if the alias key entry is specified in the key-in menu. When the caller accesses this menu and enters an alias key, the system uses the name associated with the UserName alias column for login purposes. The standard security login uses the security server password and the alias login UserName. The caller first enters an alias key, and then enters a security password. The name associated with the UserName alias column is sent to the security server as the login name. The security password entered is used as the login password. The security server will resolve this combination for security login.

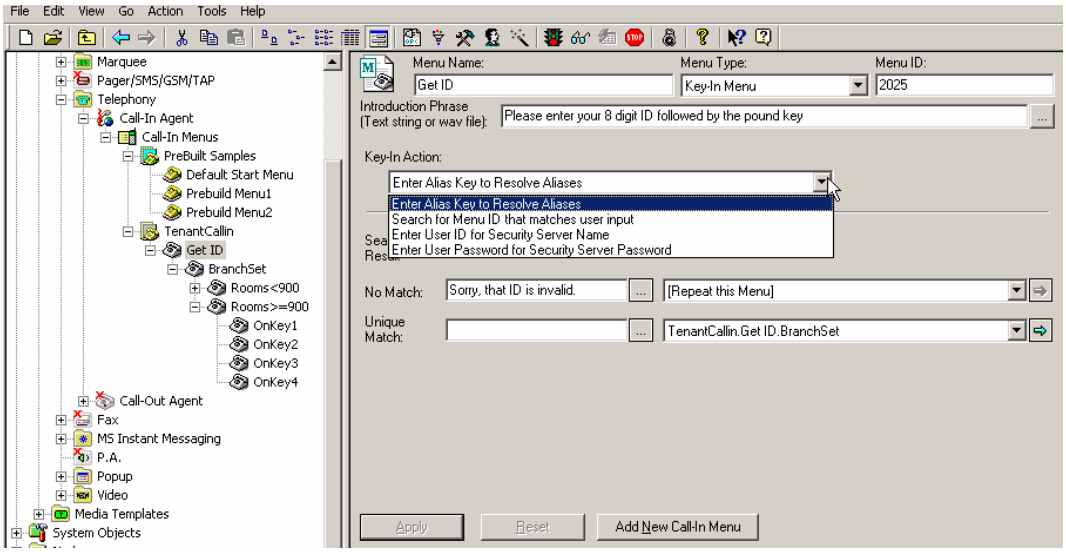


Figure 9.17. Alias Key-in Action

9.4.2.2 Creating Alias Keys

To add a new alias key to the table:

1. Right-click a column and select **Insert New Alias Key** from the pop-up menu, as shown in **Figure 9.18.**

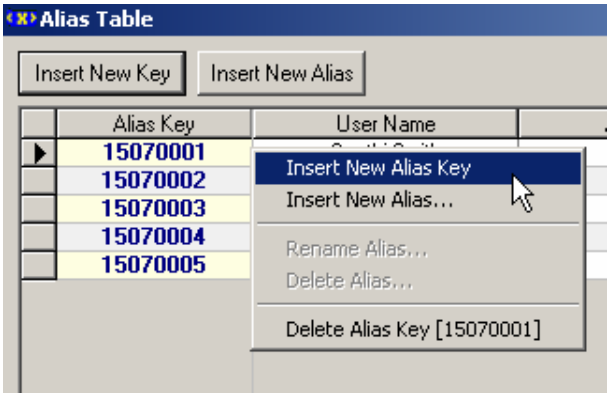


Figure 9.18. Creating an Alias Key

2. The new key appears under the **Alias Key** column, as shown in **Figure 9.19.** Type a number for the key (can be any number of digits) in the table row.

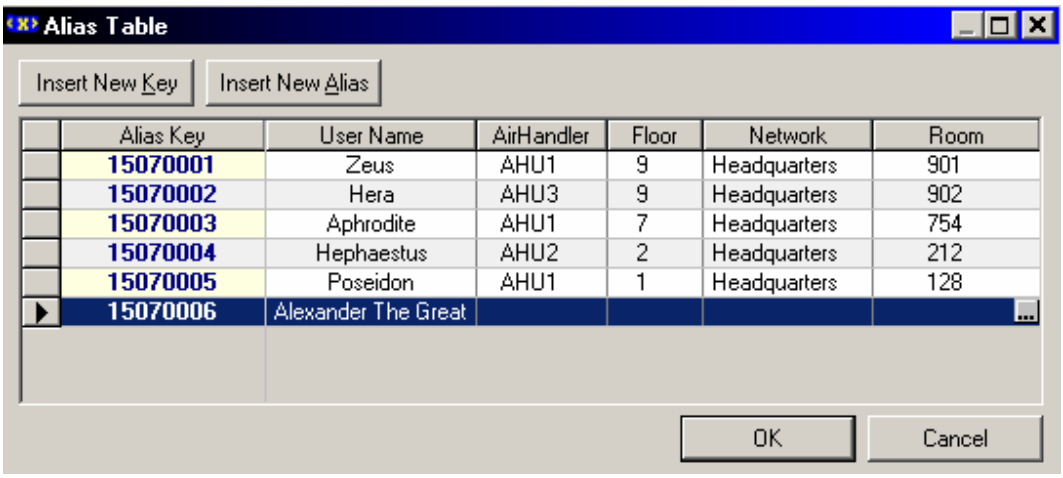


Figure 9.19. New Alias Key Added to Column

9.4.2.3 Creating New Aliases

To add a new alias to the alias table:

1. To add a new alias to the alias table, right-click inside a column and select **Insert New Alias** from the pop-up menu, as shown in **Figure 9.20.**

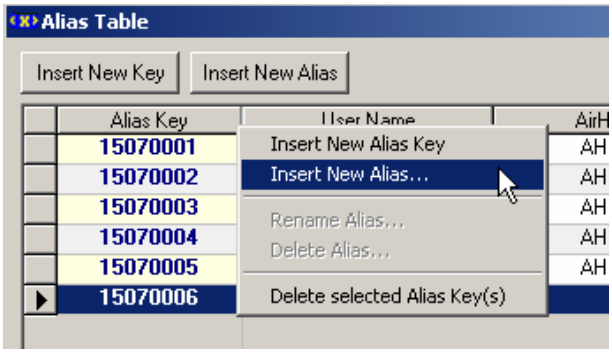


Figure 9.20. Creating a New Alias

2. The **New Call-in Alias** dialog box appears, as shown in **Figure 9.21.** Enter a name for the new alias, and then click the **OK** button.

Figure 9.21. Naming the New Alias

3. The new alias column appears in the table, as shown in **Figure 9.22.**

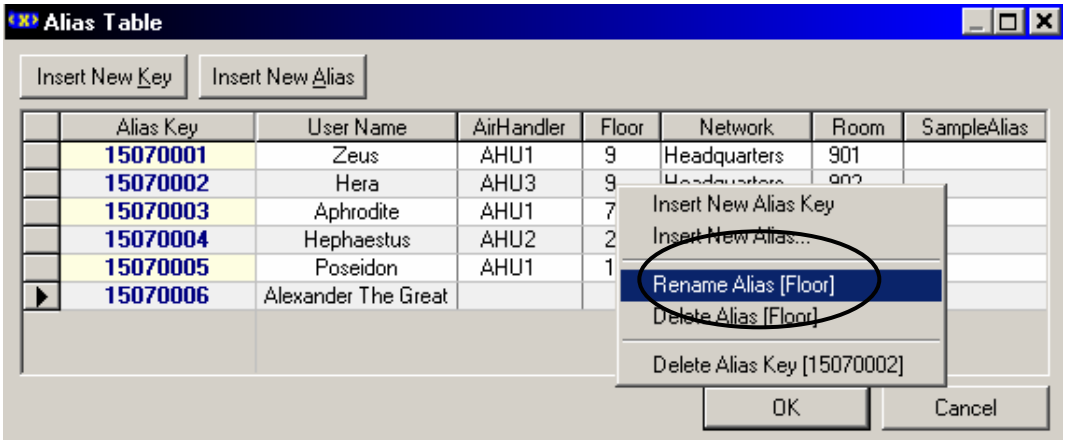


Figure 9.22. New Alias Added to Table

9.4.2.4 Deleting Alias Keys

To delete an alias key, right-click the key and select **Delete Alias Key** from the pop-up menu, as shown in **Figure 9.23.**

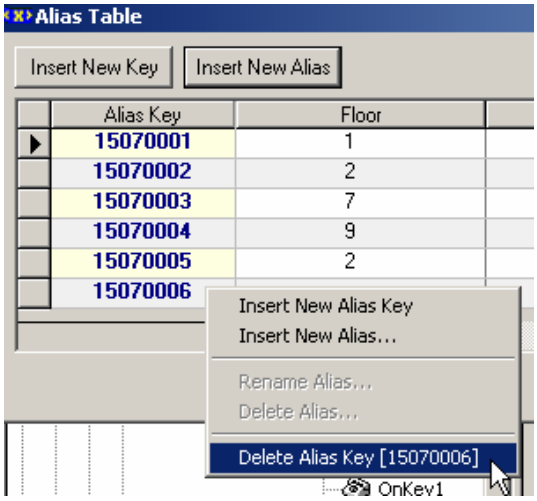


Figure 9.23. Deleting an Alias Key

9.4.2.5 Renaming Aliases

To rename an alias:

1. Right-click an alias and select **Rename Alias** from the pop-up menu, as shown in **Figure 9.24.**

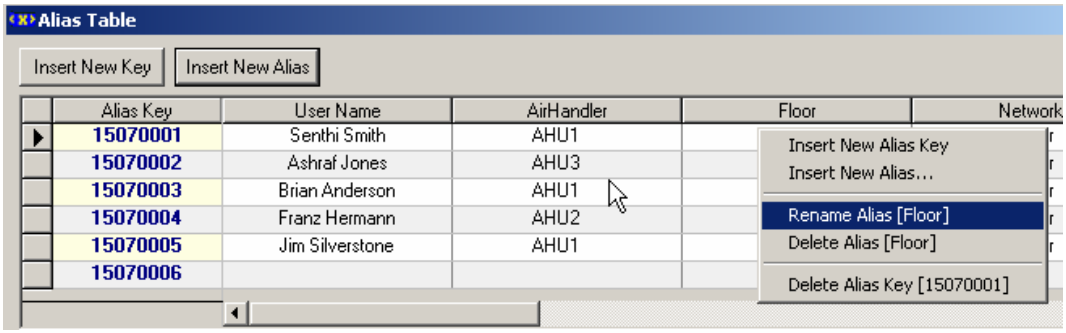


Figure 9.24. Renaming an Alias

2. The **Rename Call-in Alias** dialog box appears, as shown in **Figure 9.25.** Enter a new name for the alias, and then click the **OK** button.

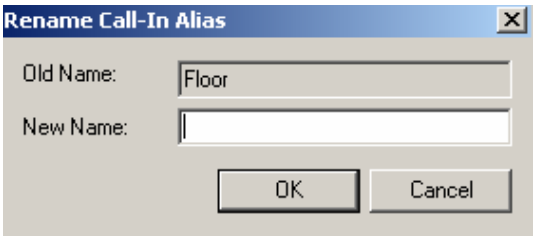


Figure 9.25. Typing a New Name for the Alias

9.4.2.6 Deleting Aliases

To remove an alias from the configuration, right-click an alias in the table and select **Delete Alias** from the pop-up menu, as shown in **Figure 9.26.**

Note: The **User Name** alias cannot be deleted.

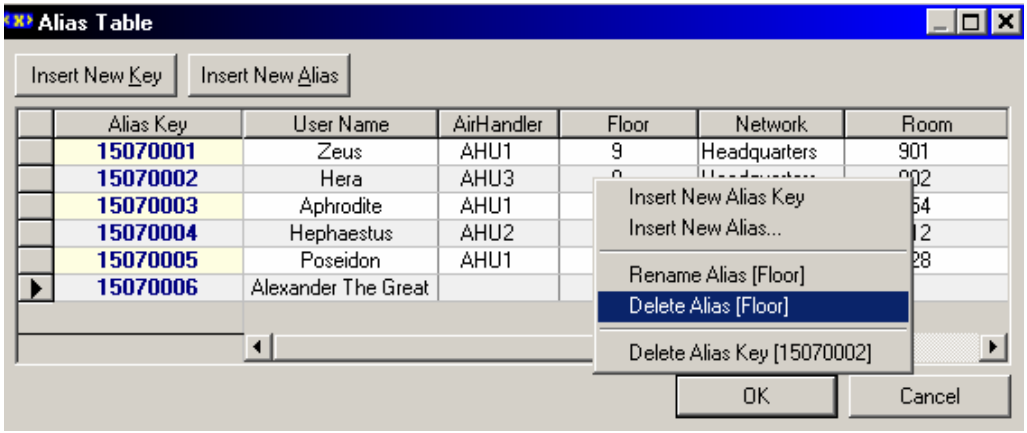


Figure 9.26. Deleting an Alias

9.5 Configuring Call-in Agent Menus

Each menu group may contain one or more Call-in Agent menus or submenus. All menus contain the following general configuration settings at the top of the configuration dialog box, as shown in **Figure 9.27.**

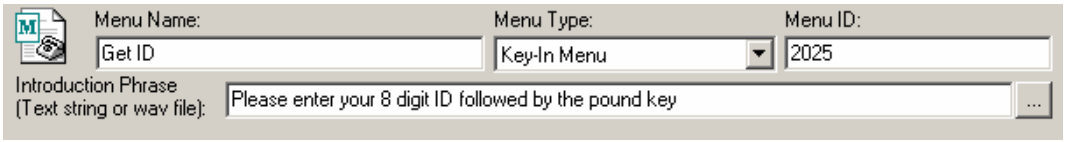


Figure 9.27. Basic Menu Configuration Settings

- **Menu Name:** Type a name for the menu in this field (maximum of 256 characters).
- **Menu Type:** Each menu contains an extensive configuration interface, which is divided into different menu types. Select from one of the following menu types:
  - Option Menu
  - Key-In Menu
  - Direct Action
  - Decision Menu
  - Alarm Menu

  For more information about configuring each kind of menu, please see the **Section 9.6.**
- **Menu ID:** The Configurator assigns a unique ID number for each menu based on the **Base ID** number of the group in which the menu was created. Menu IDs can be used as key-in actions for key-in menus (described in **Section 9.6**).
- **Introduction Phrase:** Enter the message (maximum of 256 characters) that the caller hears upon reaching the menu. The text is automatically converted to speech by the Call-in Agent. If you do not want to use a text message, you can instead select a sound file (.wav). You can also insert an alias name in this text (the alias

name appears inside double angle brackets: e.g. **<<Floor>>**). The Call-in Agent tries to resolve this alias according to the alias key that caller entered earlier in the call-in session.

Note: You can use text-to-speech messages, sound files, and text messages with aliases. For information about selecting a sound file or an alias, see the "Inserting Sound Files" and "Inserting Aliases" sections below.

9.5.1 Menu Progression and Sequence

When configuring Call-in menus, it is important to keep in mind how you want the callers to progress through the menus so that callers can efficiently communicate with the Call-in Agent. In the Call-in Agent menu configuration, you can specify the sequence of the menus by defining actions or menus that immediately follow each event.

The configuration for each menu type includes a **Next Action/Menu** field, shown in **Figure 9.28,** specifies the action or menu that results from each of the caller's actions or responses (i.e. key presses). From the drop-down list, you can select any available menu as well as the following actions:

- **Go back:** Returns the caller to the previous menu.
- **Repeat:** Repeats the current menu.
- **Hang up:** Ends the current call-in session.
- **Go to start menu:** Returns the caller to the start-up menu.
- **Go to main menu:** Returns the caller to the main menu.

If you select a menu from the drop-down list, the arrow to the right of the field is enabled, as shown in Figure 9.28. Clicking this arrow takes you to the menu you selected.

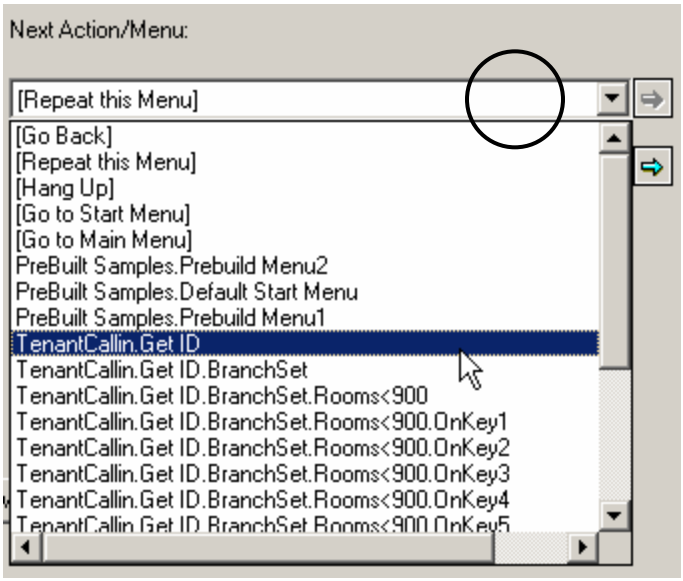


Figure 9.28. Next Action/Menu Field

9.5.2 Inserting Sound Files

If you do not want to use a text-to-speech phrase or message, you can instead select a sound file (.wav). To insert a sound file:

1. Click the **...** button next to an appropriate field (the **Introduction Phrase** field is used here as an example) and select **From Sound Library** from the pop-up menu, as shown in **Figure 9.29.**

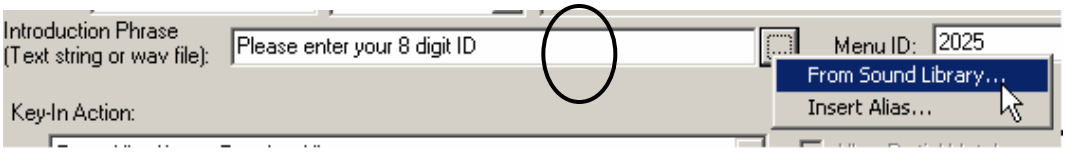


Figure 9.29. Adding a Sound File to the Menu Configuration

2. This opens the **Sound Library** dialog box, shown in **Figure 9.30.** Click the **Add Sound File** button to browse for .wav files. Click **Open** to add the selected file to the Sound Library. To listen to a file, highlight the file and click the **Play** button. To select an existing sound file from the Sound Library, highlight the entire row for that file, and then click the **Select** button. The selected sound file appears in the configuration field you selected.

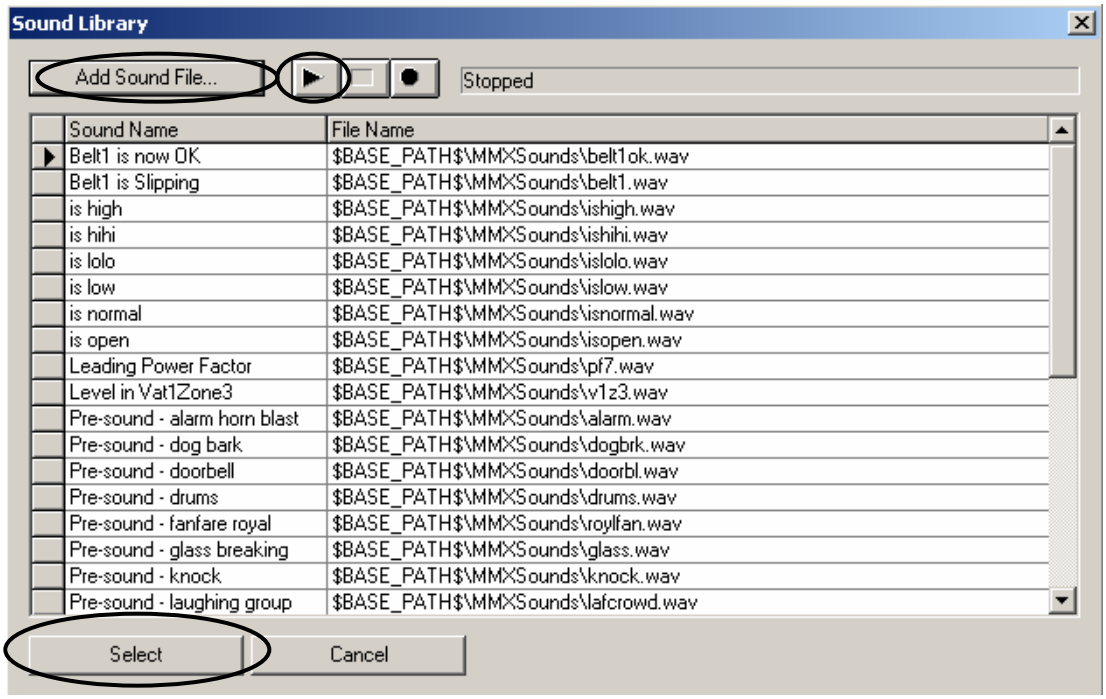


Figure 9.30. Selecting Sound Files From the Sound Library

3. The selected sound file is added to the **Introduction Phrase** field, as shown in **Figure 9.31.**

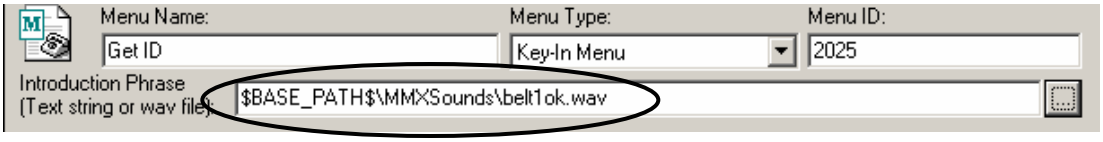


Figure 9.31. Sound File Added to Configuration

9.5.3 Inserting Aliases

To insert a an alias into a text message:

1. Click the **...** button next to the appropriate field (the **Introduction Phrase** field is used here as an example) and select **Insert Alias** from the pop-up menu, as shown in **Figure 9.32.**

Figure 9.32. Adding an Alias to the Menu Configuration

2. This opens the **Select Call-in Alias** dialog box, as shown in **Figure 9.33.** Select the desired alias, and then click the **OK** button. The selected alias appears in the configuration field you selected.

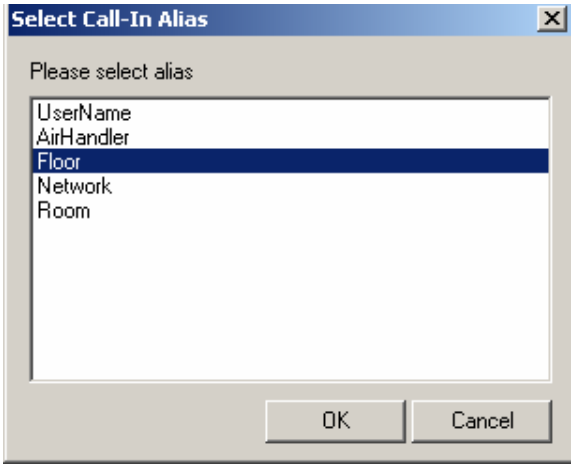


Figure 9.33. Selecting an Alias

3. The alias names that you selected (inside the double angle brackets: e.g. **<<Floor>>** and **<<Room>>**) are inserted at the current cursor position inside the text message field in the **Introduction Phrase** field, as shown in **Figure 9.34.**

Note: If any portion of the text in the field was highlighted, the inserted alias name replaces that portion.

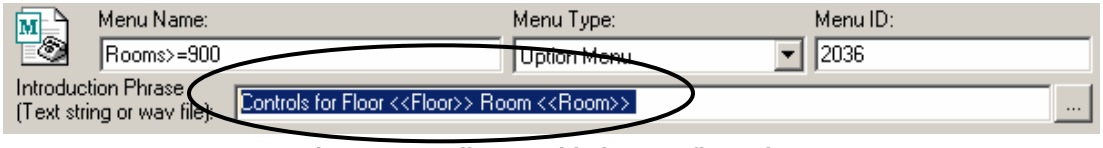


Figure 9.34. Aliases Added to Configuration

9.6 Menu Types

When configuring Call-in menus, you can select from the following types of menus, as shown in **Figure 9.35.**

- **Key-in Menu:** Contains a user-input menu with a string of digits followed by the pound key.
- **Decision Menu:** Gets rerouted to another menu based on value of an OPC tag or expression.
- **Option Menu:** Contains a list of user-configured menu choices.
- **Direct Action:** Specifies a direct, predefined action to take place upon entering the menu.
- **Alarm Menu:** Specifies a multimedia template and an alarm filter.

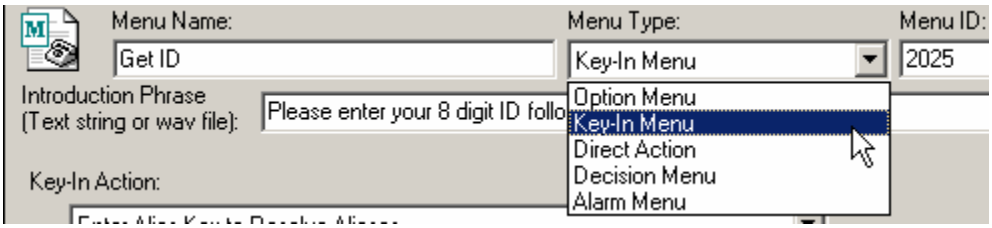


Figure 9.35. Selecting Menu Types

In describing these menu types, we will walk through various example menus from the **Tenant Callin** menu group, as shown in **Figure 9.36.**

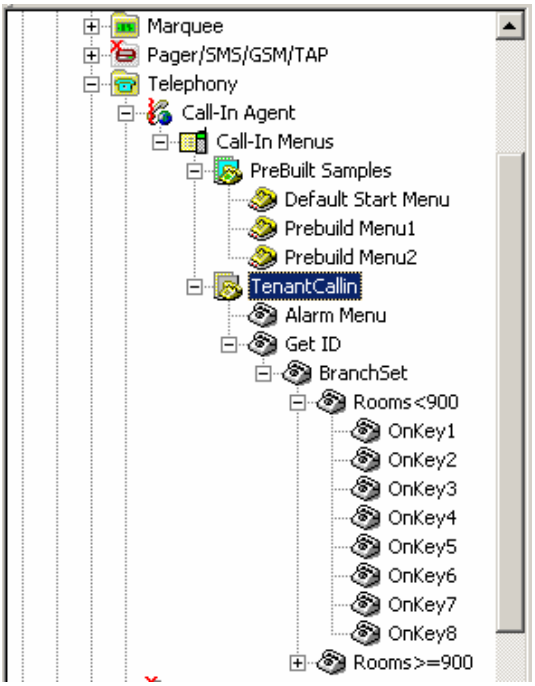


Figure 9.36. Menu Types in Group

9.6.1 Key-in Menus

A **Key-in menu,** such as the **Get ID** example menu shown in **Figure 9.37,** is a menu that expects the caller to enter in a series of digits, followed by the pound (#) key. The keys entered serve as a search parameter for finding OPC tags, aliases, menu IDs, security names, or security passwords.

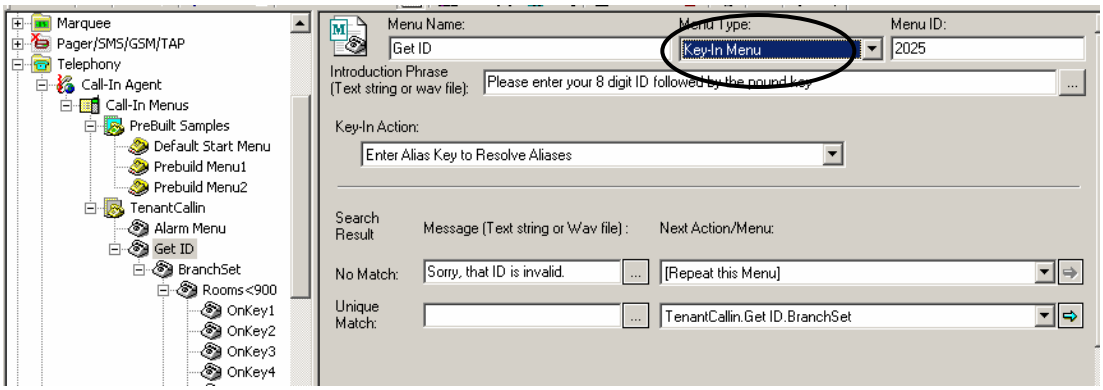


Figure 9.37. Key-in Menu

The **Key-in Action** specifies the search parameters. The caller can search for the following items:

- **Alias Key to Resolve Aliases:** Compares the caller's input with a unique alias key. The caller is prompted to enter his or her alias key. If the system recognizes the caller's alias key, it resolves the user name and all other aliases associated with the alias key.
- **Search for Menu ID:** Compares the caller's input with the unique ID number of an existing menu (e.g. 2025). If the menu ID exists, the caller is directed to the matching menu.
- **User ID for Security Server Name:** Compares the caller's input with a unique alias number. This number is used to retrieve the **UserName** alias. This string is then used in conjunction with **User Password** to create the Security Server user name and password. The input is sent to the Security Server.
- **User Password for Security Server Password:** Prompts the user for a password. This value is used in conjunction with the User ID. Both values are sent to the Security Server. This menu choice can only be used immediately after a User ID menu.

For more information about configuring the Security Server see **Section 9.8.**

The **Search Results** group specifies what happens when the caller's search is either successful or unsuccessful. There are two possible results when doing a search on caller input:

- A unique match
- No matches

For each of these possibilities, you can enter the text or select an alias or sound file to specify what the caller hears. You can also specify a menu to go to for each search result.

No Match: Specifies the message text or sound that the caller hears. (e.g. "Sorry, that ID is invalid") if the search is unsuccessful (i.e. there is no match).

Unique Match: Specifies the message text or sound that the caller hears if the search is an exact match.

The **Next Action/Menu** field specifies the action or menu that immediately follows each search result. From each drop-down list, you can select any available menu as well as the following actions:

- **Go back:** Returns the caller to the previous menu.
- **Repeat:** Repeats the current menu.
- **Hang up:** Ends the current call-in session.
- **Go to start menu:** Returns the caller to the start-up menu.
- **Go to main menu:** Returns the caller to the main menu.

Note: For information about how to select sound files and aliases, please refer to the "Inserting Sound Files" and "Inserting Aliases" sections.

9.6.2 Decision Menus

A **decision menu,** such as the **BranchSet** example menu shown in **Figure 9.38,** transports a caller to another menu based on the true/false condition of an OPC tag or the result of an expression.

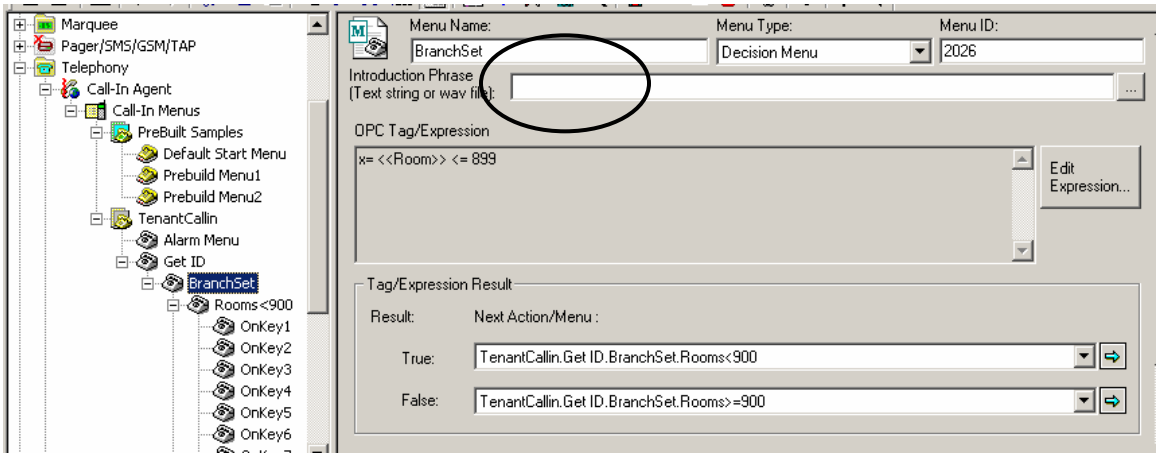


Figure 9.38. Decision Menu

The **Next Action** field specifies the action or menu that immediately follows the resolution of each OPC tag or expression that the caller accesses through the Call-in Agent. If the OPC tag or expression specified resolves to a nonzero value, or TRUE, the flow of execution goes to the menu specified in the **Next Action** drop-down list next to **True.** If the value is zero, or FALSE (or undefined), flow of execution goes to the menu specified in the **Next Action** drop-down list next to **False.**

From each drop-down list under **Next Action,** you can select any available menu as well as the following actions:

- **Go back:** Returns the caller to the previous menu.
- **Repeat:** Repeats the current menu.
- **Hang up:** Ends the current call-in session.
- **Go to start menu:** Returns the caller to the start-up menu.
- **Go to main menu:** Returns the caller to the main menu.

To specify an OPC tag or expression, click the **Edit Expression** button. This opens the **Edit Expression** dialog box, shown in **Figure 9.39.** The following options are available for editing OPC expressions:

- Arithmetic
- Relational
- Logical
- Bitwise
- Functions
- Tags

Note: For complete information about using the Expression Editor, please refer to **Chapter 2.**

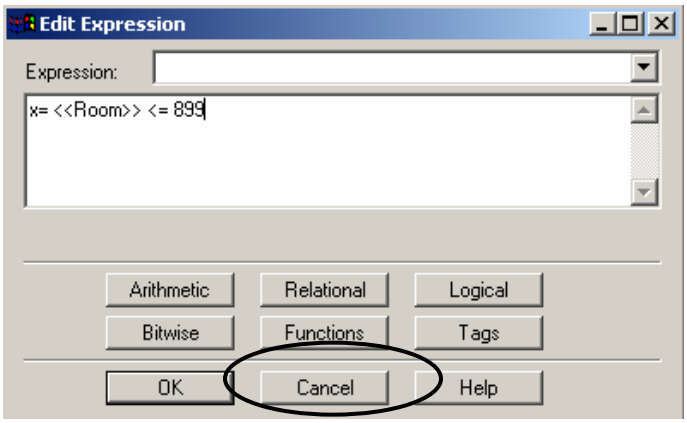


Figure 9.39. Expression Editor

To select an OPC tag, click the **Tags** button. This opens the **OPC Tag Browser,** as shown in **Figure 9.40.** Select an OPC tag from the **Data Access** tree control and then click **OK.**

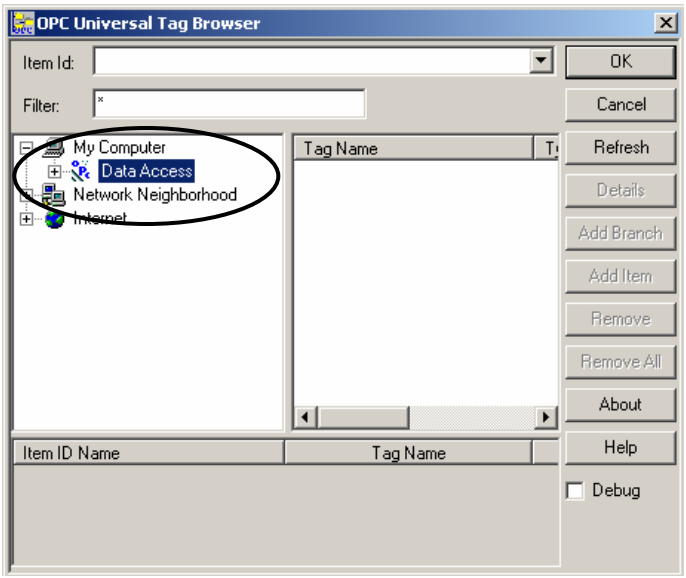


Figure 9.40. Selecting an OPC Tag From the Tag Browser

9.6.3 Option Menus

An **option menu,** such as the **Rooms<900** example menu shown in **Figure 9.41,** contains a list of options that are presented to a caller. The option menu configuration allows you to do the following:

- Enable or disable each phone key independently.
- Determine what the caller hears (i.e. a message or a sound) when the caller is presented with various options upon reaching the menu (e.g. "Press 1 to turn on fan 1").
- Specify which menu option corresponds to each of the keys on a standard phone keypad (i.e. keys 0-9, #, and *).

- Specify what happens after the caller presses each key.

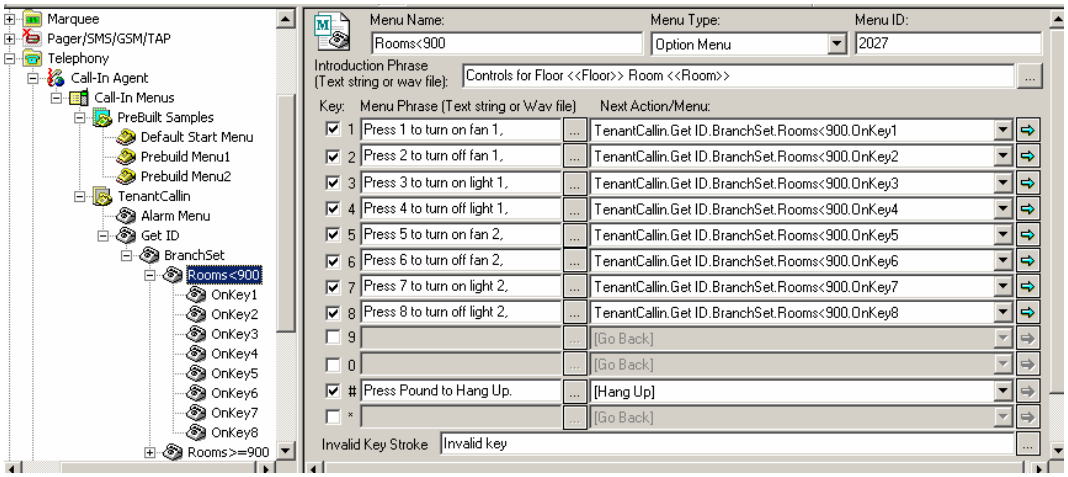


Figure 9.41. Option Menu

To enable keys for the menu:

1. Check the check box next to each key you want to use for the menu. The field under **Menu Phrase** now becomes available.
2. Under the **Menu Phrase** field for each enabled key, specify some text to be spoken or a sound file to be played. To select a sound file, click the **...** button next to each key. The caller hears each of these items in the order in which they appear in the Configurator.

   In the example menu in the figure above, when a caller reaches the menu, the caller hears the following:

   "Press 1 to turn on fan 1."

   "Press 2 to turn off fan 1."

   "Press 3 to turn on light 1."

   "Press 4 to turn off light 1."

   "Press 5 to turn on fan 2."

   "Press 6 to turn off fan 2."

   "Press 7 to turn on light 2."

   "Press 8 to turn off light 2."

   "Press Pound to Hang Up."
3. For each enabled key, you must specify an action or a menu to which the caller is directed upon pressing the key on the phone pad. The **Next Action/Menu** field specifies the action or menu that results when the caller presses the key. From each drop-down list, you can select any available menu as well as the following actions:
   - **Go back:** Returns the caller to the previous menu.
   - **Repeat:** Repeats the current menu.
   - **Hang up:** Ends the current call-in session.
   - **Go to start menu:** Returns the caller to the start-up menu.
   - **Go to main menu:** Returns the caller to the main menu.

   In the **Invalid Key Stroke** field, specify the message or sound a caller hears (e.g. "Invalid Key.") when the caller presses the wrong key.

9.6.4 Direct Action Menus

A **direct action** menu, such as the **On Key 1** example menu shown in **Figure 9.42,** supplies quick updates and writes to and reads from OPC tags. In this example, the caller is directed to this direct action menu after pressing the "1" key on the pone pad (as defined by the **Rooms<900** example option menu in the section above). Direct action menus allows for quick browsing to a specific OPC tag group (or server). The menu specifies that the caller is going to request a specific action (instead of browsing and searching through groups/tags). In this example, the caller pressed "1 to turn on fan 1." The direct action menu enables you to tell the Call-in Agent how to turn on fan 1 by specifying OPC values.

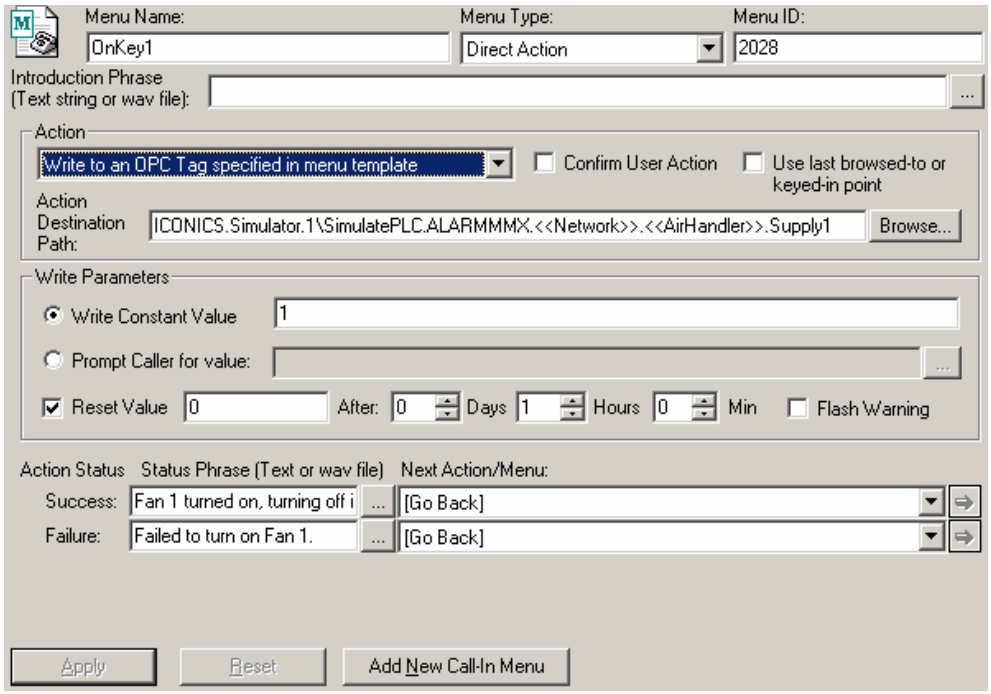


Figure 9.42. Direct Action Menu

1. Choose one of the following actions from the drop-down list under the **Action** field:
   - **Write to an OPC tag:** Writes a value to the OPC tag specified in the **Action Destination Path** field. Data to write can come from either the caller or a predefined constant.
   - **Read the value of OPC tag:** Gives the value of the OPC tag specified in the **Action Destination Path.**

     If the **Confirm User Action** check box is checked, the Call-in Agent asks whether the caller wants to proceed with the selected action before writing or reading the OPC value.

     Note: The **Use last browsed-to or keyed-in point** check box is not implemented in the current version.
2. Under **Action Destination Path,** click the **Browse** button either to launch the **OPC Tag Browser,** which allows you to select an OPC Data Access tag, or to select an alias.
3. Select from the following **Write Parameters** for OPC tags:
   - **Write Constant Value:** When this option is selected, the Call-in Agent automatically writes an OPC tag value (i.e. no action is required from the caller).
   - **Prompt Caller for Value:** When this option is selected, the caller must enter an OPC value using the phone keypad. [**Note:** The Star (*) key on the phone keypad can be used as a decimal point.] Enter the message text or select a sound file by clicking the **...** button to specify the Call-in Agent's prompt for entering the OPC value.

     Note: The **Confirm Value Changed** check box is not implemented in the current version.

     Reset Value: You can optionally specify a reset value, which is written to the same OPC tag after the specified time interval, resetting the OPC value written by this menu action. When **Flash Warning** is checked, the system switches the OPC tag between the tag's current (write) value and its reset value before finally resetting the tag value. The lead time, time off, time on, and number flashes are specified in the flash warning parameters set in the general Call-in settings. (Refer to the "Configuring General Call-in Agent Settings" section above.)
4. Under the **Action Status** field**,** you must specify what the caller hears (message or sound) when the OPC read/write is a **success** or a **failure.** In this example, the action is successfully completed when fan 1 is turned on.

   You must specify an action or a menu to which the caller is directed upon success or failure. The field allows you to specify the action or menu that results when the caller presses the key. From each drop-down list under **Next Action/Menu,** select an available menu or one of the following actions:
   - **Go back:** Returns the caller to the previous menu.
   - **Repeat:** Repeats the current menu.
   - **Hang up:** Ends the current call-in session.

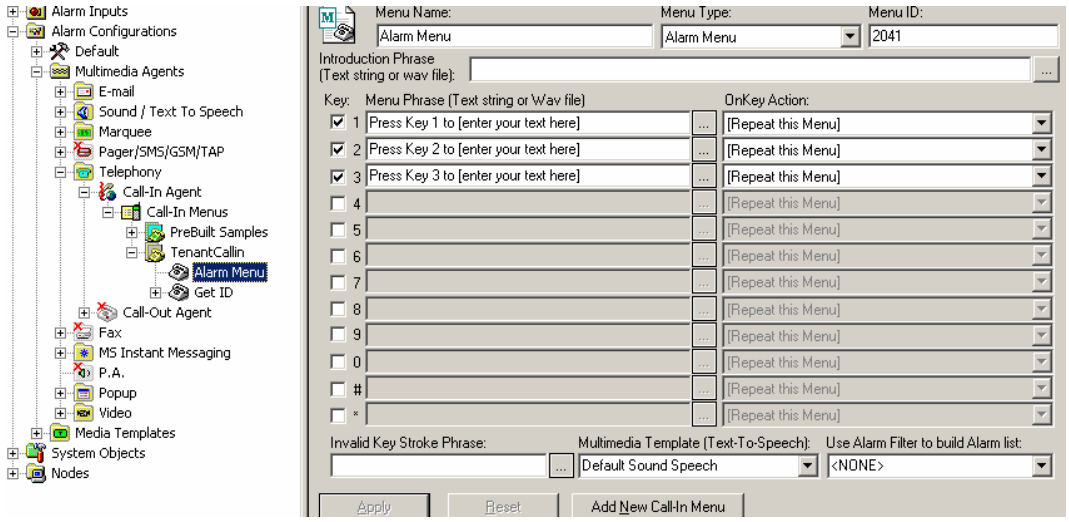
- **Go to start menu:** Returns the caller to the start-up menu.
- **Go to main menu:** Returns the caller to the main menu.

9.6.5 Alarm Menus

An **Alarm Menu** is similar to an Option menu in that it contains a list of options that are presented to a caller. The option menu configuration allows you to do the following:

- Enable or disable each phone key independently.
- Determine what the caller hears (i.e. a message or a sound) when the caller is presented with various alarms upon reaching the menu.
- Specify which menu option corresponds to each of the keys on a standard phone keypad (i.e. keys 0-9, #, and *).
- Specify what happens after the caller presses each key.

You can also specify a multimedia template (text-to-speech type) and an alarm filter.



Alarm Menu

For each enabled key, you must specify an action or a menu to which the caller is directed upon pressing the key on the phone pad. The **Next Action/Menu** field specifies the action or menu that results when the caller presses the key. From each drop-down list, you can select any available menu as well as the following actions:

- Go back: Returns the caller to the previous menu.
- Repeat: Repeats the current menu.
- Hang up: Ends the current call-in session.
- Go to start menu: Returns the caller to the start-up menu.
- Go to main menu: Returns the caller to the main menu.
- Play next alarm
- Play previous alarm
- Repeat last alarm
- Play alarm at the top of the list
- Refresh alarm list
- Acknowledge current alarm
- Acknowledge alarms played
- Acknowledge all alarms
- Play total number of alarm messages
- Play total number of acknowledged messages
- Play total number of messages in alarm state
- Play total number of unacknowledged messages

- Play total number of operators' messages
- Play total number of tracking messages

In the **Invalid Key Stroke** field, specify the message or sound a caller hears (e.g. "Invalid Key.") when the caller presses the wrong key.

9.7 Starting and Stopping the Call-in Agent

When the Call-in Agent is in configuration mode, the Call-in Agent branch on the tree control appears as shown in **Figure 9.43.** Notice that the phone icon has a red mark on it, indicating that the Call-in Agent server is turned off.

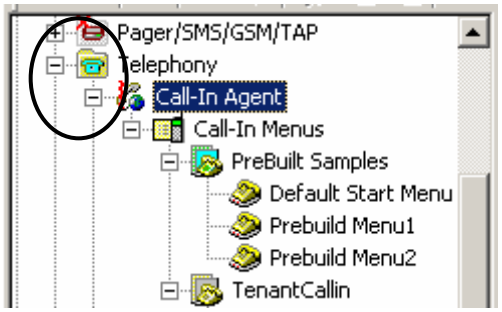


Figure 9.43. Call-in Agent in Configuration Mode

9.7.1 Starting the Call-in Agent

When your Call-in Agent configuration is complete, you must start the Call-in Agent server in order for callers to call in to the system.

1. Click the **Start Call-in Agent** button on the general settings dialog, as shown in **Figure 9.44.**

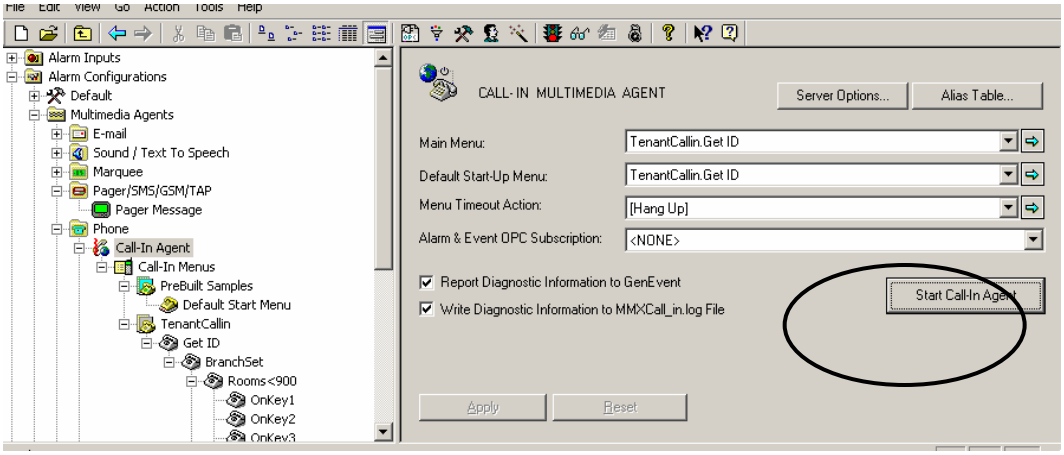


Figure 9.44. Starting the Call-in Agent

2. As the Call-in Agent loads, a progress window appears, as shown in **Figure 9.45.**

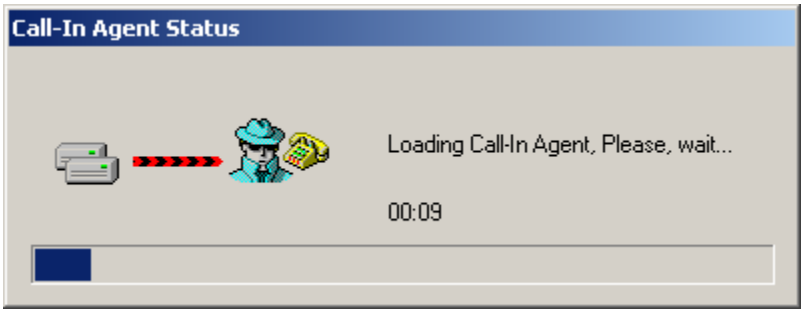


Figure 9.45. Call-in Agent Loading

3. Once the Call-in Agent is running, you can call the number of the phone line attached to the Dialogic card to dial in to the system. The red mark over the phone icon in the tree control is now removed to indicate that the Call-in Agent is running, as shown in **Figure 9.46.**

Figure 9.46. Call-in Agent Running

9.7.2 Stopping the Call-in Agent

After you start the Call in agent, the **Start Call-in Agent** button changes to say **Stop Call-in Agent.**

1. Click the **Stop Call-in Agent** button on the general settings dialog.
2. As the Call-in Agent shuts down, a progress window appears.

9.8 Security Administration

The Multimedia Configurator includes a **Security Administration** tool (for the Call-in Agent only) that mimics the Security Configurator, enabling you to configure user IDs and passwords for the Security Server. Once you have configured security for the Call-in Agent, you can specify when callers must enter their user IDs and passwords in the key-in menu configuration by selecting one of the following **key-in actions:**

- **User ID for Security Server Name:** Compares the caller's input with a unique alias number. This number is used to retrieve the **UserName** alias. This string is then used in conjunction with User Password to create the Security Server user name and password. The input is sent to the Security Server.
- **User Password for Security Server Password:** Prompts the user for a password. This value is used in conjunction with the User ID. Both values are sent to the Security Server. This menu choice can only be used immediately after a User ID menu.

To log into the Security Server, create entries in the Security Server. Call-in entries must be a string name and a numeric password. In the Call-in Agent, add an alias key with a UserName matching the string name in the Security Server. Set up a Key-in menu with Key-in action: **User ID for Security Server Name.** The unique match from this menu must be a second Key-in menu with Key-in action: **User Password for Security Server Password.** This combination will log the user into the Security Server. Hanging up will automatically log the user out.

Note: For more information about Security Server settings, please refer to the Security Configurator and Security Login application Help documentation. For information about key-in menu settings, please see the Key-in Menus section above.

9.8.1 Logging into the Security Administration Tool

The **Security Administration** tool allows Security Server administrators to configure security setting for users and groups. You must enter an administrator password to use the Security Administration tool.

1. Click the **Security Administration** button (lock icon) on the toolbar. The **Security Server Administrator Login** dialog box appears, as shown in **Figure 9.47.** Enter the **Security Server Administrator's** user name and password, and then click the **OK** button.

   Note: A default administrator password is specified during installation. You will use this password to gain administrator access to the Security Server for the first time. When a new user is added to the system with Administrator privileges, the default password is disabled. The default password remains disabled as long as there is at least one user with administrator privileges. The Multimedia security administration tool does not allow you to use a default administrator account. In other words, the "Administrator" security account must be created first with the regular Security Configurator. This must be created in **Advanced** security mode. For more information about security modes, please see the Security Configurator Help documentation.

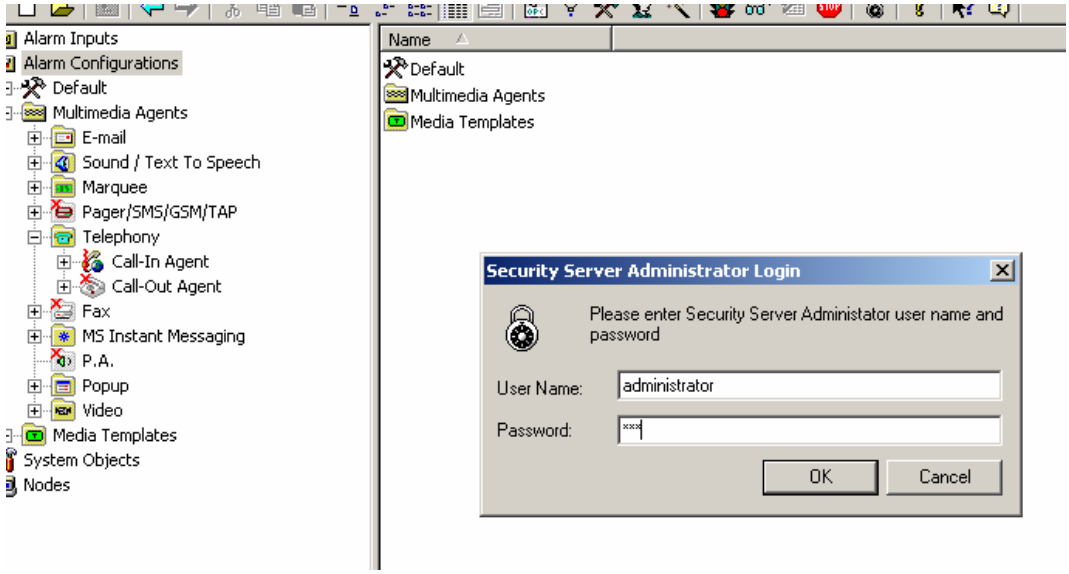


Figure 9.47. Logging Into the Call-in Agent Security Administration Tool

2. The **Security Administration** console appears, as shown in **Figure 9.48.** The configuration console consists of two separate panes. Each pane has a tree control. The left tree is the **Group View.** Here the root nodes are groups, and the child nodes are the users that belong to the group. The right tree is the **User View,** in which the root nodes are users, and the child nodes are the groups that have been assigned to each user. Some example groups and users are shown in the figure below.

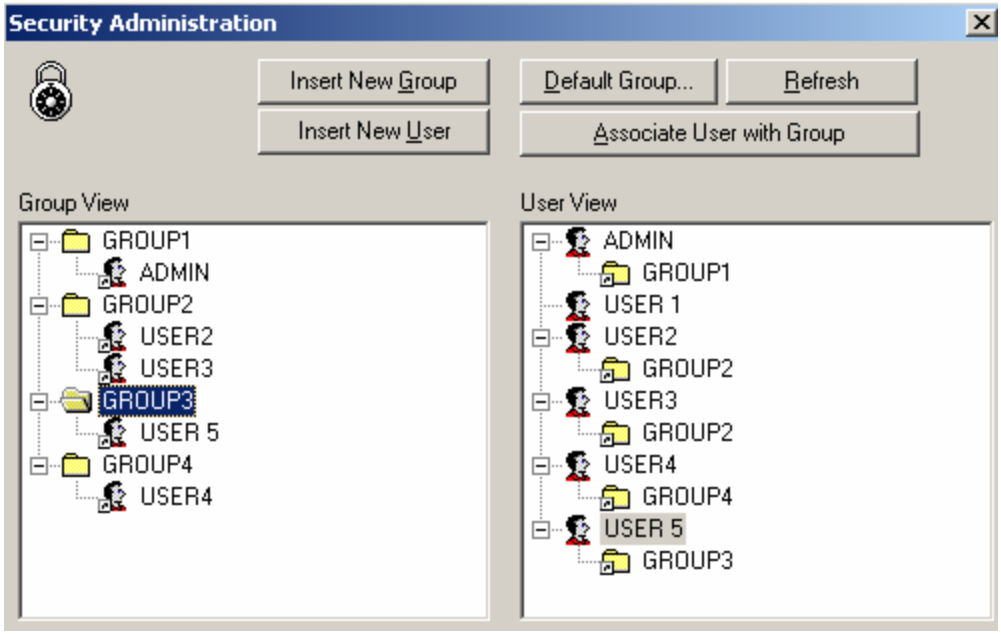


Figure 9.48. Security Administration Console

9.8.2 Configuring Users and Groups

The **Security Administration** console, shown in **Figure 9.49,** enables you to create user profiles and groups to customize Call-in Agent restrictions on a per-user basis. The figure below shows some example users associated with various roles.

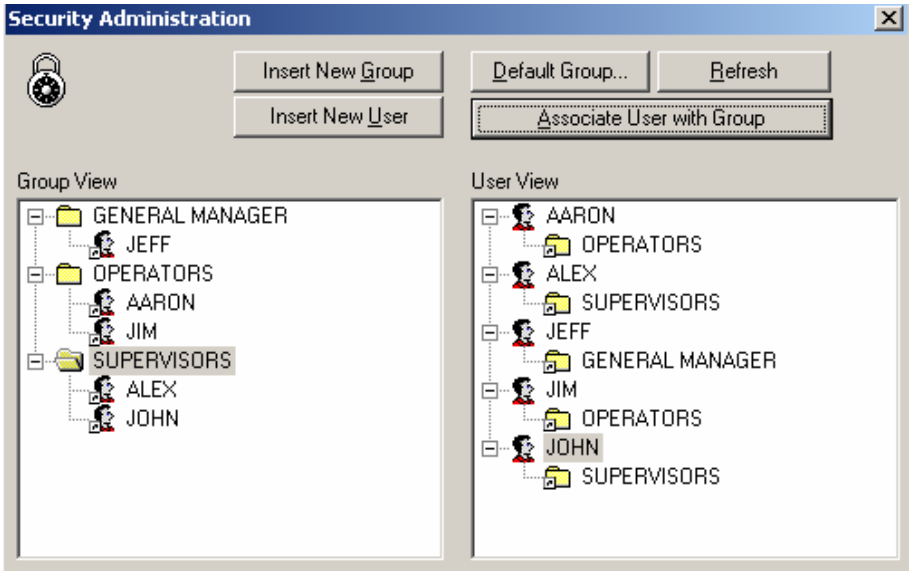


Figure 9.49. Configuring Security for Users and Groups

The example roles are:

- General Manager
- Supervisors
- Operators

Each of these roles is associated with five different example users:

- Aaron (Operator)
- Alex (Supervisor)
- Jeff (General Manager)
- Jim (Operator)
- John (Supervisor)

You can associate users with various groups to help simplify and organize security management. This way all users associated with a particular group are bound to the restrictions or properties for that group. For example, both Jim and John are supervisors, associated with the Supervisors group, and Jeff is associated with the General Manager group. If there are certain Call-in menus that only the general manager and supervisors are allowed to view but the operators may not view, the security administrator can use the Security Administration console to lock the operators out of those menus.

You can also configure properties for each user within a group. For example, both Aaron and Jim are operators and are therefore associated with the Operators group. However, Aaron's user properties may be configured separately from those of Jim so that each user within the group has unique security restrictions.

9.8.3 Adding a New Security Group

To add a new group to the Security Administration console:

1. Click the **Insert New Group** button, as shown in **Figure 9.50.**

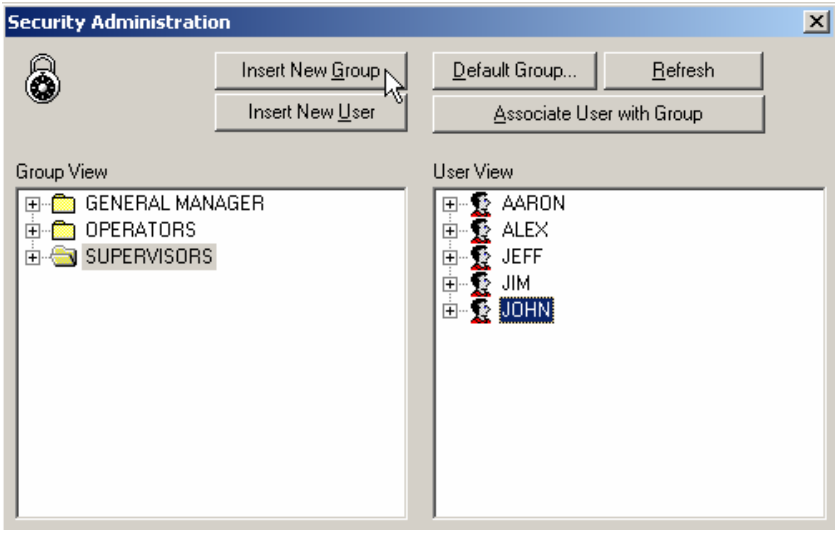


Figure 9.50. Adding a New Group

2. This adds a new group under the **Group View** tree. The name is highlighted, as shown in the figure below. It is suggested that you change the name at this point before further editing.

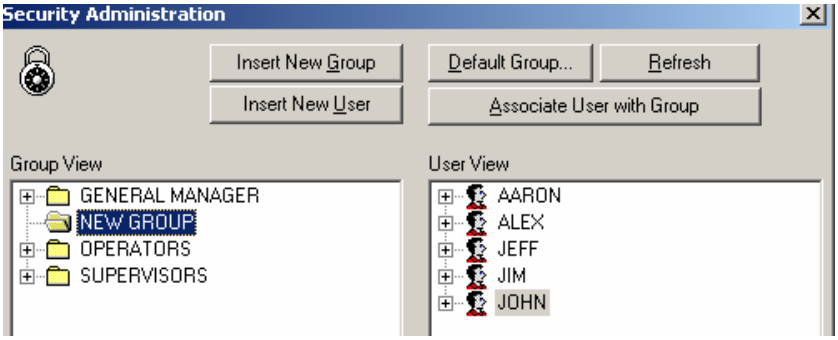


Figure 9.51. New Group Added to Group Tree

9.8.4 Adding a New User Profile

To add a new user profile to the Security Administration console:

1. Click the **Insert New User** button, as shown in **Figure 9.52.**

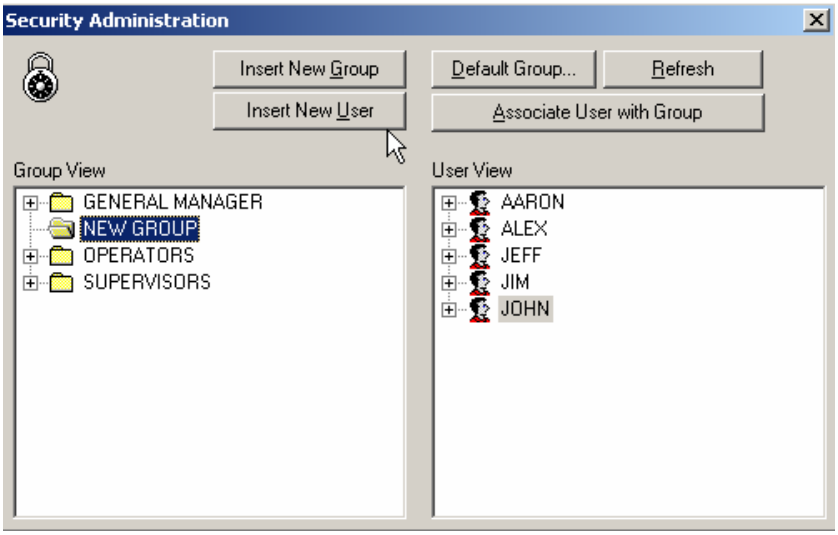


Figure 9.52. Adding a New User Profile

2. This adds a new user under the **User View** tree. The name is highlighted, as shown in **Figure 9.53.** It is suggested that you change the name at this point before further editing.

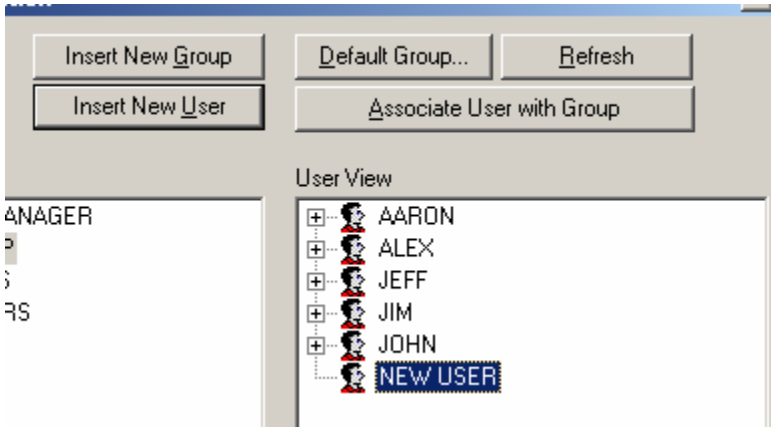


Figure 9.53. New User Added to User Tree

9.8.5 Deleting Users and Groups

To delete a user or a group from Security Administration console, select the desired group in the **Group View** tree, or the desired user in the **User View** tree, and do the following:

1. Right-click on the item and select **Delete** from the pop-up menu, as shown in **Figure 9.54.**

   Note: If you select a child item in the tree instead of a root item (i.e. you select a user in the group tree or a group in the user tree) and perform a delete as described above, you will remove the child item from the parent (dissociate the group from the user) but not actually delete it.

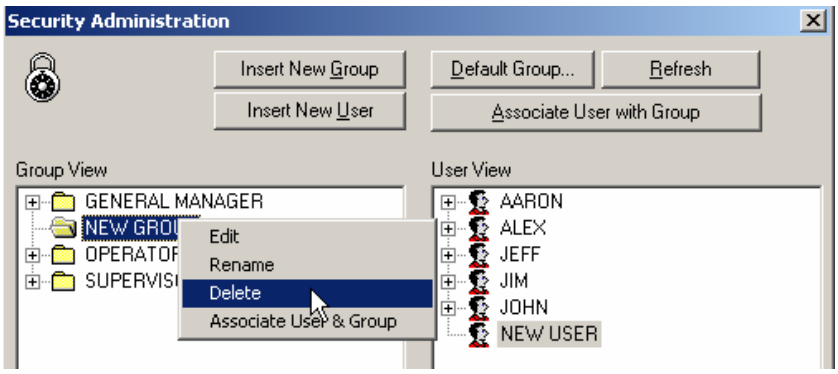


Figure 9.54. Deleting Users and Groups

2. You are then asked to confirm the deletion, as shown in **Figure 9.55.** Click **OK** to delete the user or group.

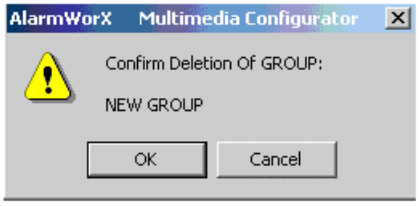


Figure 9.55. Confirming Deletion of a User or Group

9.8.6 Associating Users and Groups

To associate a group with a user in the Security Administration console:

1. Select the user to be associated under the **User View** tree.

2. Right-click the group to be associated under the **Group View** tree and select **Associate User & Group** from the pop-up menu (or click the **Associate User with Group** button), as shown in **Figure 9.56.**

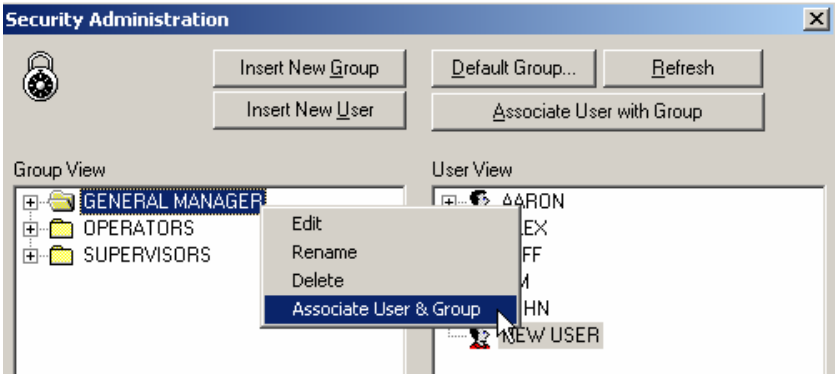


Figure 9.56. Associating Users and Groups

3. When a user and group are associated, the user appears as a child item under the group tree in the left pane, and the group appears as a child item under the user tree in the right pane, as shown in **Figure 9.57.** In this example, the user "Jeff" has been associated with the group "General Manager."

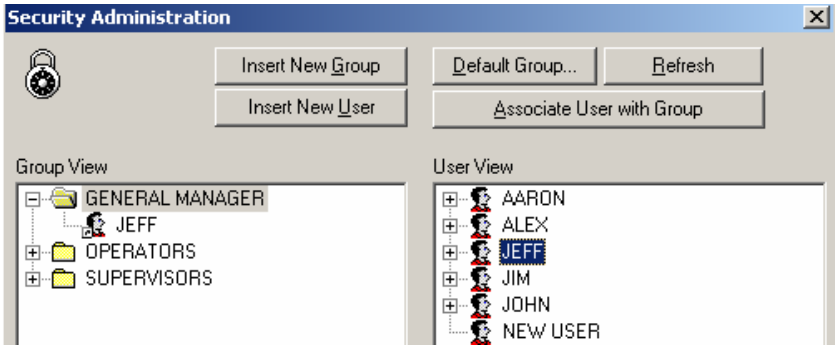


Figure 9.57. Viewing User and Group Associations

9.8.7 Removing Associations Between Users and Groups

To remove the association between a user and a group in the Security Administration console:

1. Select the user child item under the desired group in the left pane, or select the group child item under the desired user in the right pane.

2. Right-click the user or group to be dissociated and select **Delete** from the pop-up menu, as shown in **Figure 9.58.**

3. When the association is removed, the child user under the group in the left pane is removed, and the child group under the user in the left pane is removed.

Note: Performing this operation never deletes the selected user or group. Only their association is removed.

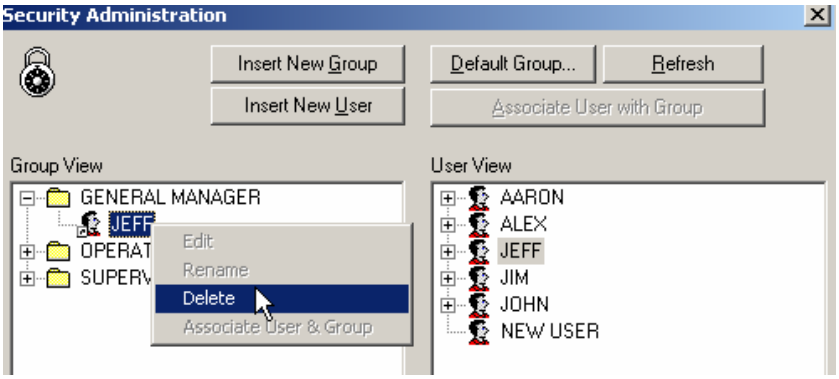


Figure 9.58. Dissociating Users and Groups

9.8.8 Editing Users and Groups

To edit the properties assigned to a user or a group in the Security Administration console:

1. Select the desired group in the group tree, or the desired user in the user tree.

2. Right-click on the group or user and select **Edit** from the pop-up menu, as shown in **Figure 9.59.**

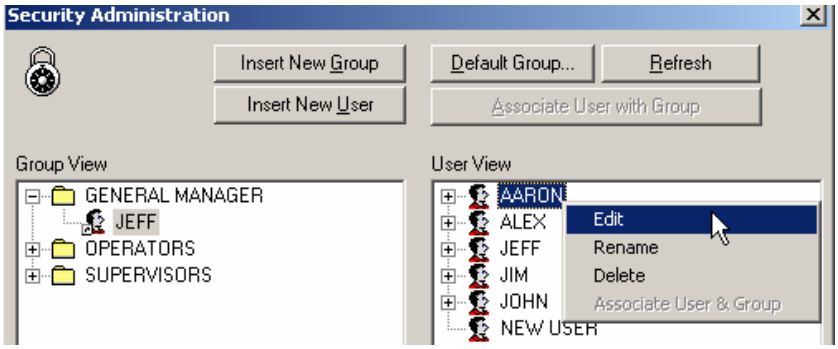


Figure 9.59. Editing User and Group Properties

This opens the **Properties** dialog box, shown in the figure below, which is used to configure a user or group. The **Properties** dialog box contains the following tabs:

- Properties
- Call-in Menus
- Points
- Time Sheet
- Account Policy

9.8.9 Configuring Properties for Users and Groups

The properties for users and groups vary slightly. The group fields are a subset of the user fields. The following fields are for users, as shown in **Figure 9.60.**

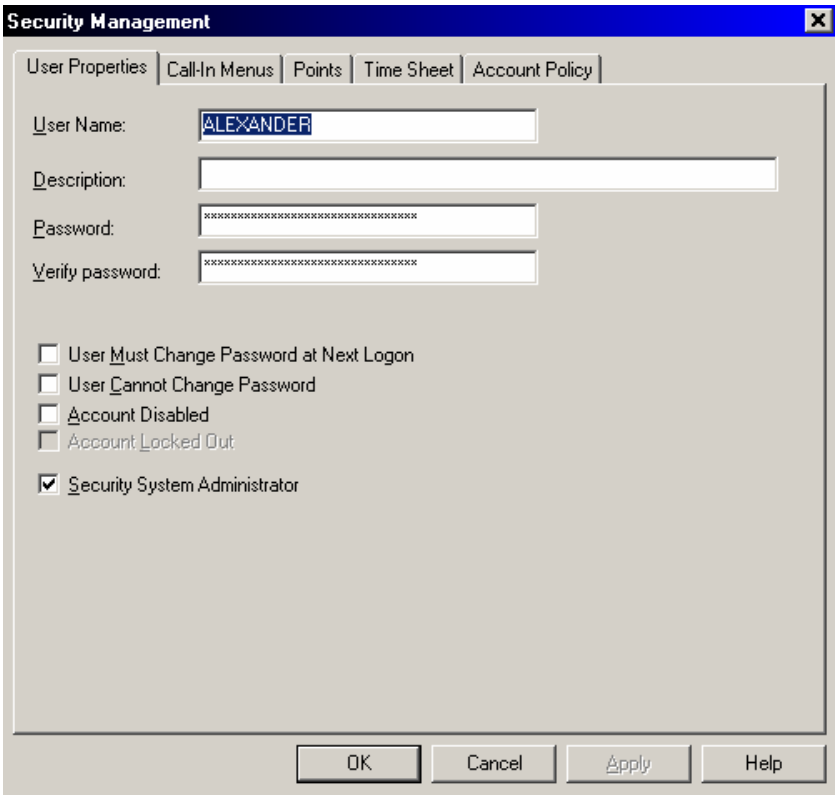


Figure 9.60. Configuring User Properties

Field	Description
User Name	Short name that the user types when logging on to the system.
Full Name	The user's full name for reference only (optional).
Description	Optional.
Password	The password the user must type to log in to the Security Server. This field is case-sensitive; no spaces are allowed.
Verify Password	If you change the **Password** field, you must type the exact same password into this field.
User Must Change Password at Next Logon	When checked, the user must change his or her password at the time of the next logon. This is often used when a new user created. The administrator enters a default password for the new user and checks this field to require a "real" password to be entered on first logon.
User Cannot Change Password	When checked, the user's password can only be changed from this dialog, and not from the Login Client.
Account Disabled	Checking this check box has the same effect as deleting the user without the permanence of an actual delete. The **Account Disabled** check box is checked by default, so you must uncheck this box in order to activate the user's account.
Account Locked Out	This field is normally unchecked and disabled. Should the account become locked out (see the account lockout description in the **Account Policy** tab), the field would be enabled and checked. From here, the administrator can uncheck the field to re-enable the user logon.
Security System Administrator	When checked, this user is allowed to log in as a Security System Administrator to configure all aspects of the security system.

The following fields are for groups, as shown in **Figure 9.61.**

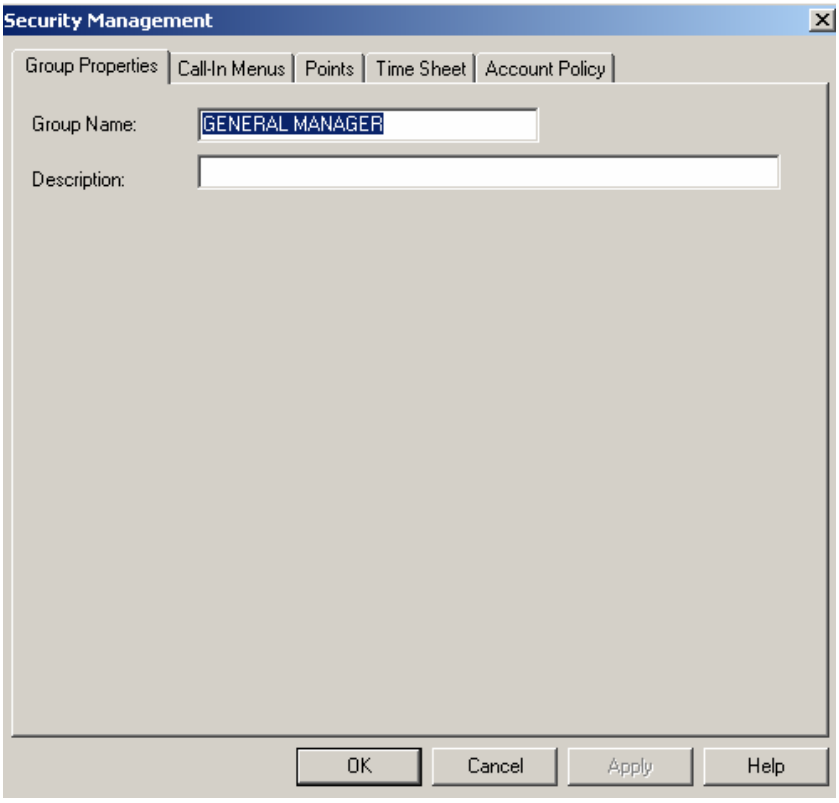


Figure 9.61. Configuring Group Properties

Field	Description
Group Name	Short name (no spaces) that uniquely identifies this group within the system.
Description	Optional.

Note: The **User Name** and **Password** can be used as key-in actions key-in menus.

9.8.10 Call-in Menus Security

The **Call-in Menus** tab of the user and group properties dialogs, shown in **Figure 9.62,** sets the user and group access restrictions for specific configured call-in menus. To allow or restrict access, the security administrator must include or exclude certain projects and pages by doing the following:

1. Click the **Browse** button under the **Include** or **Exclude** field.

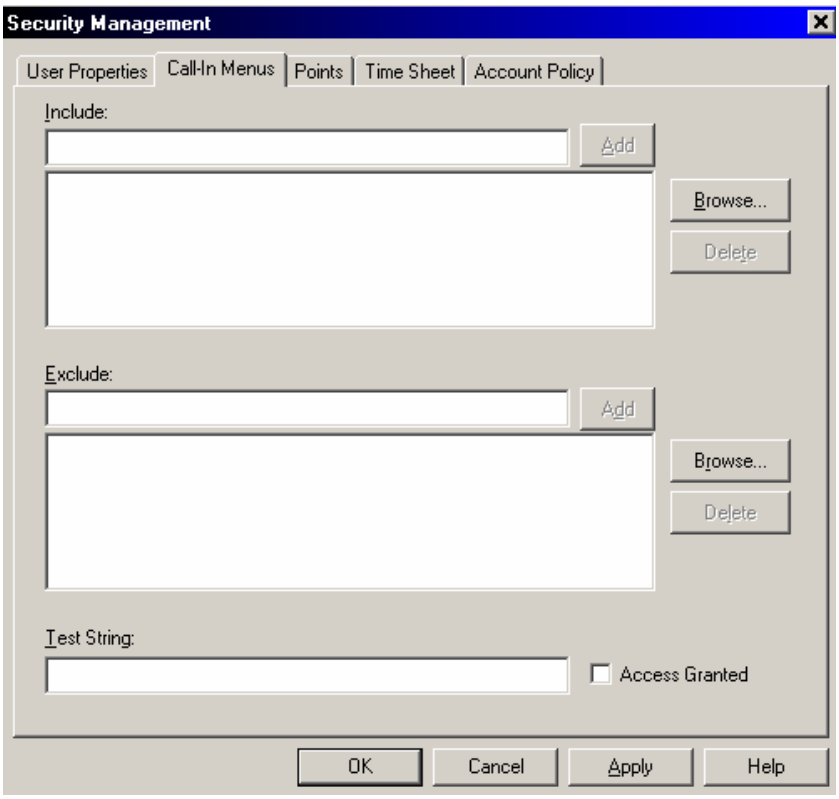


Figure 9.62. Setting User and Group Access Restrictions for Call-in Menus

2. This opens the **Call-in Menus Browser** dialog box, shown in **Figure 9.63,** which displays all available Call-in menus from the Configurator tree control. Simply select the menus that you wish to include to allow the user or group access (or exclude to prevent user or group access). Click **OK.**

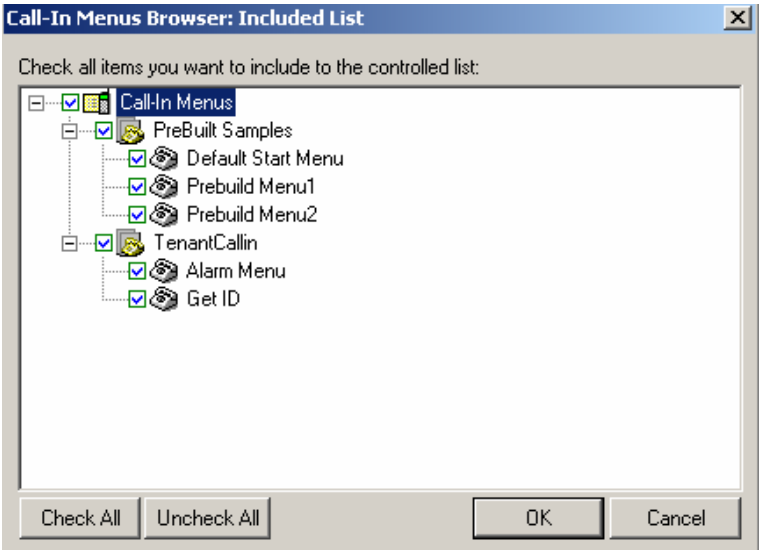


Figure 9.63. Selecting Call-in Menus To Include

3. The selected menus now appear under the **Include** and **Exclude** fields, as shown in **Figure 9.64.** To remove menus, highlight the item and click the **Delete** button. Click **Apply** to save changes to the user or group properties.

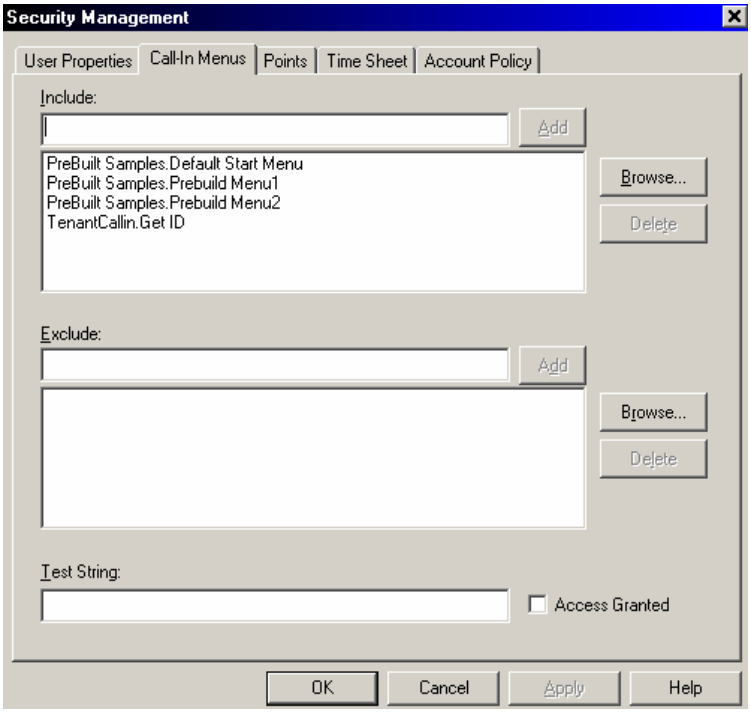


Figure 9.64. Included and Excluded Call-in Menus

9.8.11 Points

A ProcessView application that is configured to send outputs to points in OPC servers will disable them if denied by the Security Server. As with the file names, OPC point names with or without wildcards are placed in include or exclude lists for each user or group.

Before a ProcessView client outputs a process value to an OPC server, the unique string that identifies the OPC output point is sent to the Security Server to determine if the write should be allowed based on the currently logged-in user(s) and or the groups to which they belong. The **Points** tab of the **Properties** dialog box, as shown in **Figure 9.65,** is used to configure which OPC output points are allowed to be written to by users and groups.

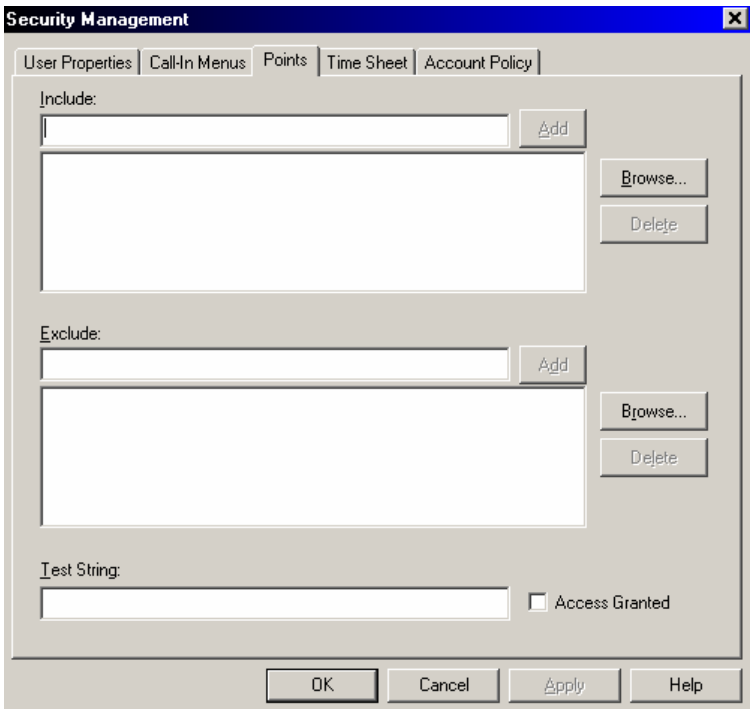


Figure 9.65. Points Configuration

The **Points** property page is divided into two sections, **Include** and **Exclude.** Each section contains an edit field and a list box. You can select strings by using the **Browse** buttons. Pressing the **Enter** key with the cursor in the edit field or clicking the **Add** button adds the edit field text to the list box. When an entry in the list box is selected, pressing the **Delete** key or clicking the **Delete** button deletes the selected entry.

If you type a string in the **Test String** field, the **Access Granted** check box indicates if access would be given to the user if the access to the "test string" was requested. The test is made using only the include and exclude lists that are visible.

During runtime, when a ProcessView client sends an OPC point string to the Security Server for access testing (granted or denied), the include and exclude lists are string compared as follows for each active user and group until access is granted:

1. Compare the OPC point string with each string in the include list until a match is found. If no match is found, access is denied.
2. If a match is found in the include list, compare the OPC point string with every string in the exclude list. If no match is found in the exclude list, access to the point is granted, and no further testing of active groups and users is performed.

Note: The exclude list entries can only remove rights granted in their corresponding include list. For example if user *Aaron* belongs to the group *Operators,* and *Operators* grants access to OPC point *xyz,* adding point *xyz* to *Aaron's* exclude list has no effect.

Wildcards and Pattern Matching

The entries in the include and exclude lists allow pattern matching similar to the Visual Basic LIKE operator. Built-in pattern matching provides a versatile tool for string comparisons. The pattern-matching features allow you to use wildcard characters, character lists, or character ranges, in any combination, to match strings.

Text results in string comparisons are based on a case-insensitive textual sort order determined by your system's locale, for example:

(A=a) < (À=à) < (B=b) < (E=e) < (Ê=ê) < (Z=z) < (Ø=ø)

The following table shows the characters allowed in patterns and what they match:

Character(s) in pattern	Matches in string
?	Any single character.
*	Zero or more characters.
#	Any single digit (0 - 9).
[*charlist*]	Any single character in *charlist.*
[!*charlist*]	Any single character not in *charlist.*

A group of one or more characters (*charlist*) enclosed in brackets ([ ]) can be used to match any single character in string and can include almost any character code, including digits.

Note: The special characters left bracket ([), question mark (?), pound sign (#), and asterisk (*) can be used to match themselves directly only by enclosing them in brackets. The right bracket (]) cannot be used within a group to match itself, but it can be used outside a group as an individual character.

In addition to a simple list of characters enclosed in brackets, *charlist* can specify a range of characters by using a hyphen (-) to separate the upper and lower bounds of the range. For example, [A-Z] in pattern results in a match if the corresponding character position in string contains any of the uppercase letters in the range A-Z. Multiple ranges are included within the brackets without any delimiters.

The meaning of a specified range depends on the character ordering valid at run time (as determined by the locale setting of the system the code is running on). The range [A - E] matches A, a, À, à, B, b, E, e. Note that it does not match Ê or ê because accented characters fall after unaccented characters in the sort order.

Other important rules for pattern matching include the following:

- An exclamation point (!) at the beginning of *charlist* means that a match is made if any character except the ones in *charlist* is found in string. When used outside brackets, the exclamation point matches itself.
- The hyphen (-) can appear either at the beginning (after an exclamation point if one is used) or at the end of *charlist* to match itself. In any other location, the hyphen is used to identify a range of characters.
- When a range of characters is specified, they must appear in ascending sort order (from lowest to highest). [A-Z] is a valid pattern, but [Z-A] is not.

- The character sequence [] is ignored; it is considered a zero-length string.

9.8.12 Time Sheet

The **Time Sheet** property page allows time-of-day restrictions on an hourly basis for users and groups. For hours that are selected (highlighted) in the lists, access is allowed. For hours that are not selected, access is denied. **Figure 6.66** shows a configuration that allows access from 8 AM to 4 PM each day.

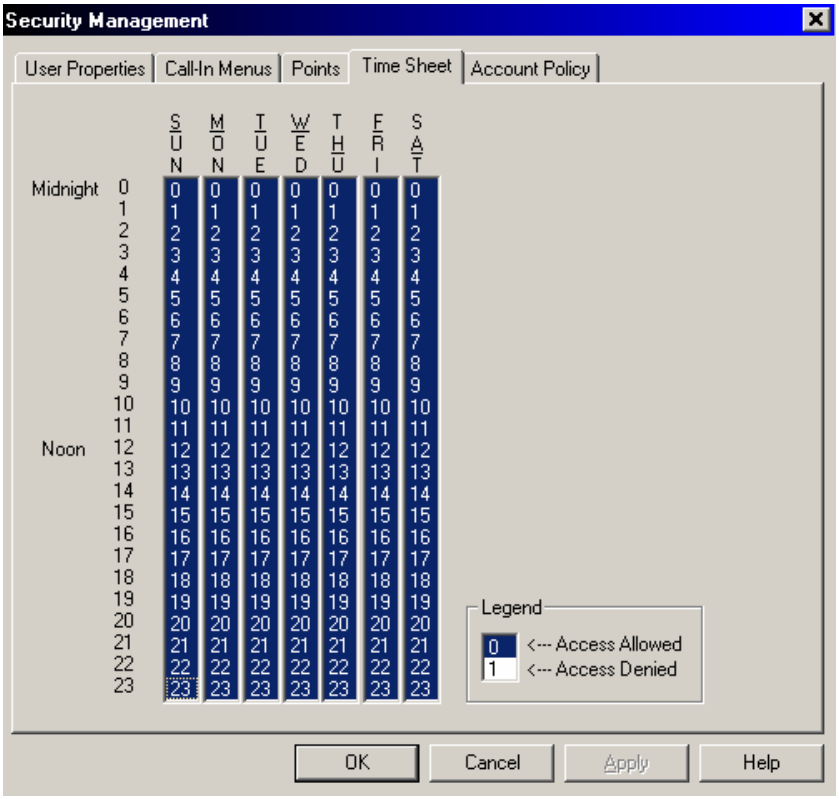


Figure 9.66. Time Sheet

9.8.13 Account Policy

The **Account Policy** property page is used to show how passwords must be used, and whether user accounts are automatically locked out after a series of incorrect login attempts. The base policy (i.e. the most restrictive) for the system is set in the default group (see the "Editing the Default Group" section). For users and groups other than the default group, each policy can selectively be enabled and set for that user or group.

During runtime, if more than one policy setting is in effect, the least restrictive is used. For this reason, the policy set in the default group must be the most restrictive. Individual users and groups can be made less restrictive than the default, but never more restrictive.

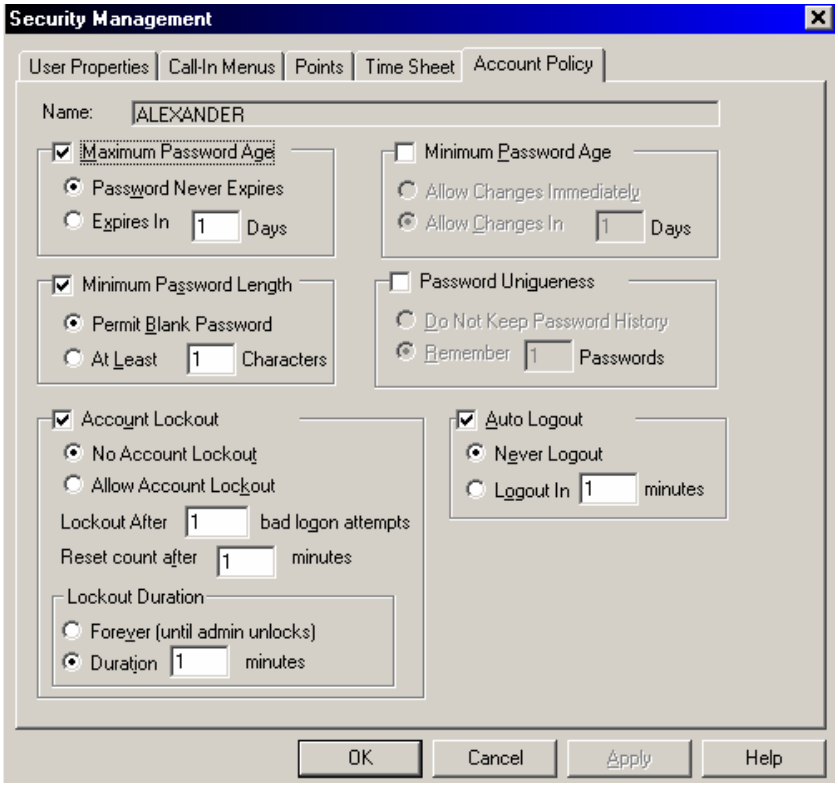


Figure 9.67. Account Policy Configuration

Field	Description
Maximum Password Age	Sets a time limit for a password, after which the user must change to a new password. If this is selected, the **Expires in** value can range from 1 to 999 days. To make the password permanent, select **Password Never Expires.**
Minimum Password Age	Sets the period of time a password must be in effect before the user can change it. If this is selected, the value can range from 1 to 999 days. To allow the user to change the password at any time, select **Allow Changes Immediately.** **Note:** Do not allow immediate changes if a **Password Uniqueness** value is entered.
Minimum Password Length	In the **At Least** field, this specifies the fewest number of characters a password can contain. If this is selected, the value can range from 1 to 14 characters. If **Permit Blank Password** is selected, there is no minimum password length.
Password Uniqueness	The number of new passwords that must be used by a user account before an old password can be reused. If **Remember Passwords** is selected, the value can range from 1 to 24 passwords. If **Do Not Keep Password History** is selected, there is no password uniqueness. **Note:** For uniqueness to be effective, an age value should be specified for **Minimum Password Age** (**Allow Immediate Changes** should not be selected).
No Account Lockout	When selected, user accounts are never locked out, no matter how many incorrect login attempts are made on a user account.
Account Lockout	If selected, all user accounts are subjected to lockout. If too many incorrect login attempts are made on a user account, no more than a specified amount of time between these, the account is locked out. If you select **Account Lockout,** you should also do the following: In **Lockout After,** type the number of incorrect login attempts that will cause the account to be locked. The range is 1 to 999. In **Reset Count After,** type the number of minutes that must pass between any two login attempts to ensure that a lockout will not occur. The range is 1 to 999. Click **Duration** and type the number of minutes that locked accounts will remain locked before automatically becoming unlocked. The range is 1 to 999. Or, select **Forever** in **Lockout Duration** to keep locked accounts locked out until an administrator unlocks them.

Field	Description
Password Complexity	This option mimics the NT test for complexity. The password must: Not contain all or part of the user's account name. Be at least six characters in length. Contain characters from three of the following four categories: English upper case characters (A-Z) English lower case characters (a-z) Base 10 digits (0-9) Non-alphanumeric (For example, !,$#,%)
Auto Logout	If selected, sets the number of minutes from the time of user login, before the system automatically logs the user off. The range is 1 to 999 minutes.
Logout Password	To log out of the Security Server, the user specified in the **User Name** field of the **Security Login** dialog of the Security Login application must click the **Log Out** button, as shown in the figure below. When a **Logout Password** is required in the user's account policies, the user must type in his or her password when logging out.

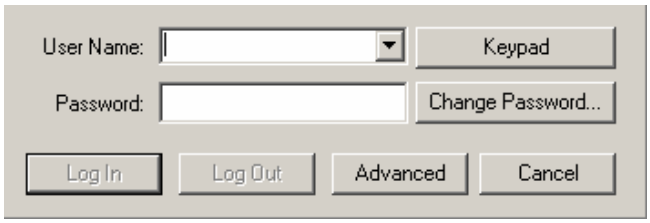


Figure 9.68. Security Login Dialog Box in Security Login Application

9.8.14 Editing Default Group Settings

The system **default group** (available in advanced security configuration mode only) is used to assign access rights that are granted regardless of whether any users are logged in. When the Security Server is first installed, the default group has full access to everything. The first step in configuring the security system is to remove most if not all access rights assigned to the default group.

Note: You must configure the default group to have minimum access rights, because individual users and groups can only add access rights but can never remove rights already granted in the default group**.**

1. To edit the default group, click the **Default Group** button in the Security Administration console, as shown in **Figure 9.69.**

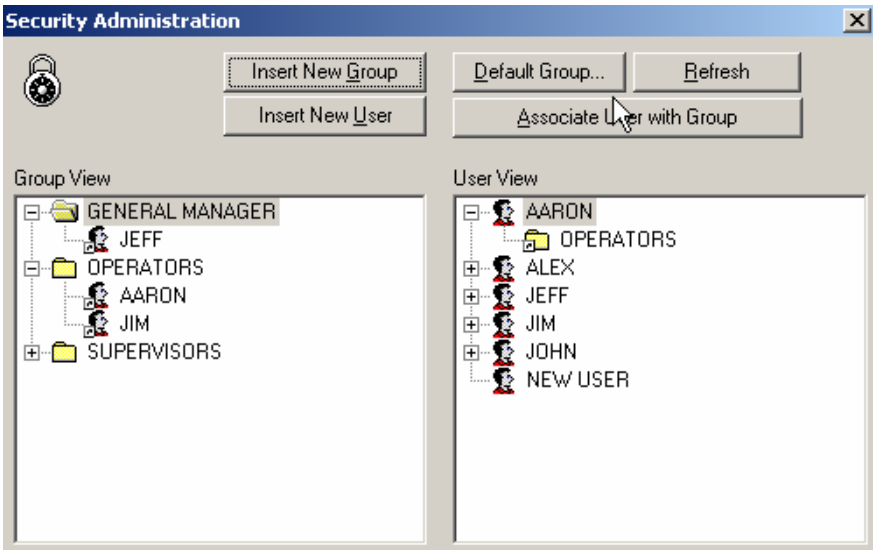


Figure 9.69. Editing the Default Group

2. This opens the **Properties** dialog box for the default group, as shown in the figure below. The same property pages used to edit ordinary groups are also used for the default group, with the following differences:

   - There is no **Time Sheet** property page. Default access is valid for all times.
   - **Account Policy** must be set in the default group, and there are two additional fields in this property page: **Simultaneous Logins** and **Allow Auto NT Login.** Checking the **Simultaneous Logins** box allows more than one user to be logged in to a single station at the same time. The effective access rights on that station become the sum of all rights of all logged in users.

Note: See **Editing Users and Groups** for details about configuring group properties. See the **Account Policy** section above for details about user and group account restrictions.

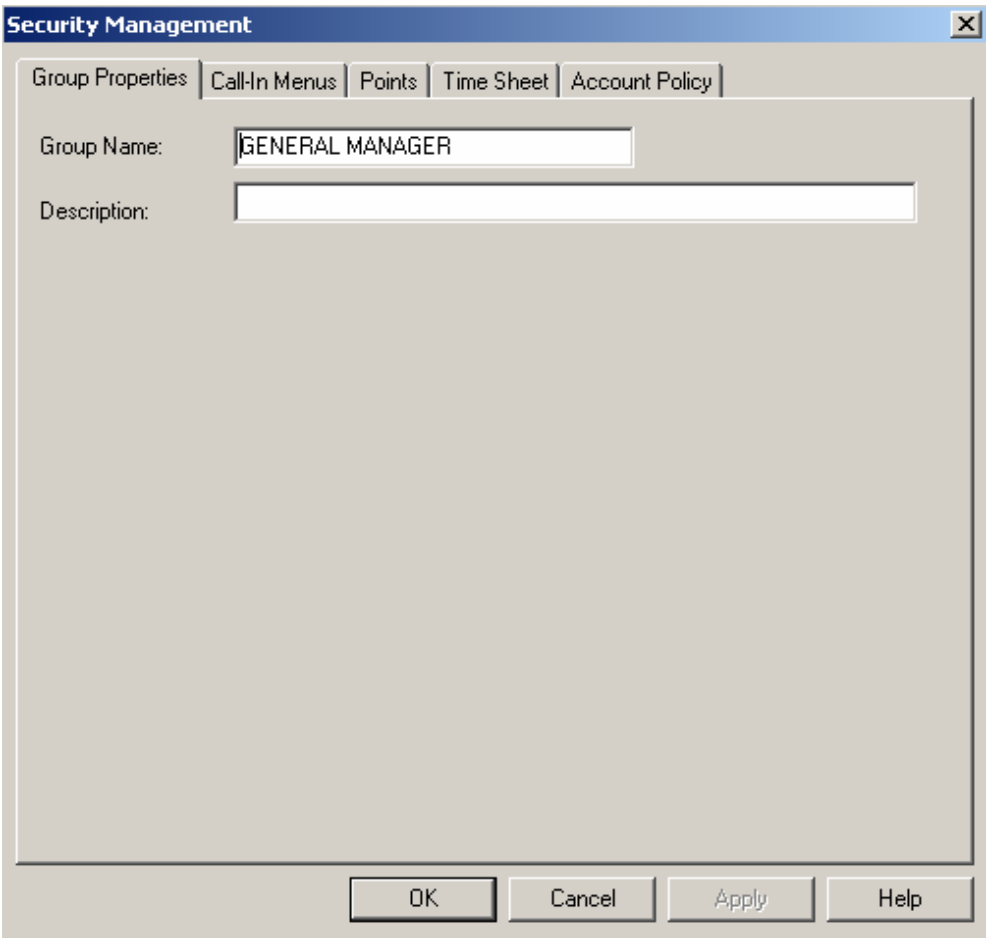


Figure 9.70. Default Group Properties

Appendix A

Pager Configuration

A.1 Overview of Pager Services Configuration

The Multimedia Configurator offers a Pager Agent that connects to a wide variety of pager services and supports the most popular paging protocols:

- Tele Alphanumeric Protocol (TAP)
- Simple Messaging Service (SMS)

Other variations are supported as well, such as Paging Entry Terminal (PET), which is basically the same as TAP.

The method through which a page is sent depends on the type of pager being used. For example, in the United States the predominant pager type uses TAP, and uses a standard modem to communicate. TAP pagers can also use Integrated Services Digital Network (ISDN) carriers. The Multimedia Configurator user interface calls out the use of "Modem/ISDN Service" (rather than specifying actual protocols used), as this is more straightforward for users to understand.

Note: It is the paging service and the Multimedia software that communicate via TAP; it is not something special in the modem itself. Therefore, most 'Hayes compatible" off-the-shelf modems should work for sending TAP messages.

SMS pagers offer more sophisticated interaction. For example, they permit two-way paging. In the case of Multimedia, this allows users to send an "Acknowledge" back to the alarm system directly from the pager. SMS paging messages are not sent over a modem, but rather use the Global System for Mobile Communications (GSM) network. Again, rather than calling out the low-level protocols used, the Multimedia Configurator interface refers to the method of communication, and calls this "GSM/PCS Service."

A.1.1 Installation

During the installation of AlarmWorX Multimedia, after checking the box for including the Pager Agent, you can select which paging services to include with the installation. There are two separate lists: one for the Modem/ISDN (TAP) pagers, as shown in **Figure A.1,** and one for GSM/PCS (SMS) pagers. Note that you can select more than one. Simply use **Shift-Click** to select a sequential set, or **Ctrl-Click** to select items that are not next to each other.

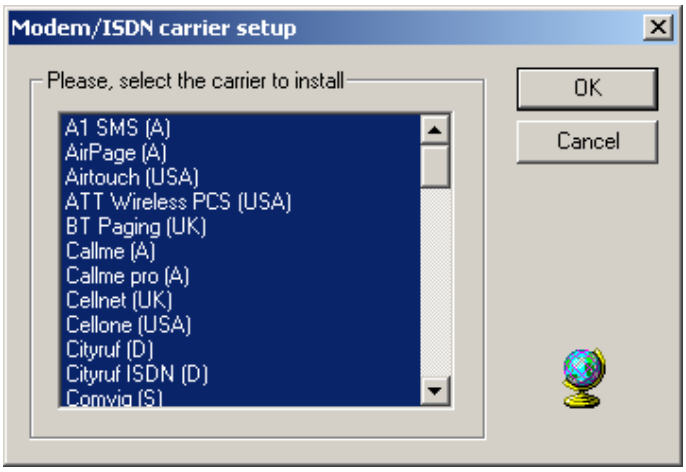


Figure A.1. Modem / ISDN Services Setup

A.1.2 Modem Configuration

To configure your modem, use the following procedure:

1. Plug in the modem hardware.
2. From the Windows Control Panel, select **Phone and Modem Options.**
3. Create or edit the dialing rules.
4. Add the appropriate drivers for the modem hardware.
5. Test the modem using a windows modem utility, such as HyperTerminal.

Note: The actual dialog boxes vary between Windows operating systems.

A.2 Creating and Modifying Pager Services

If you found your service in the list and have already installed it, you need not read this section. Instead, move on to the "Pager Configuration Settings" section below.

If you did not find your service in the list, you can set up a new TAP or SMS pager service. You can also edit the parameters for an existing pager service (e.g., in case the access phone number for your service changes).

1. Launch the Multimedia Configurator.
2. Select **Alarm Configurations - Multimedia Agents - Pager/SMS/GSM/TAP** from the tree control on the left-hand side, as shown in **Figure A.2.**
3. Launch the services configuration by clicking the **General Settings** button in the Pager Agent configuration, shown in Figure A.2.
4. The **TAP/SMS** diagnostics will be displayed, as shown in **Figure A.3,** giving you the option to view and log ISDN/GSM diagnostic messages during pager testing.
5. Click the **Modem Configuration** button to launch the Message Master configuration. This opens the **DERDACK Message Master Configuration** dialog box, as shown in **Figure A.4.** Here you have two options: **Message Master GSM/PCS** and **Message Master Modem/ISDN.** To configure TAP services, select the **Message Master Modem/ISDN** option, and then click the **Config...** button. To configure SMS services, select the **Message Master GSM/PCS** option, and then click the **Config...** button (or double-click on the item in the list).

   Note: Click the **Help** button at any time to view the Message Master help documentation.

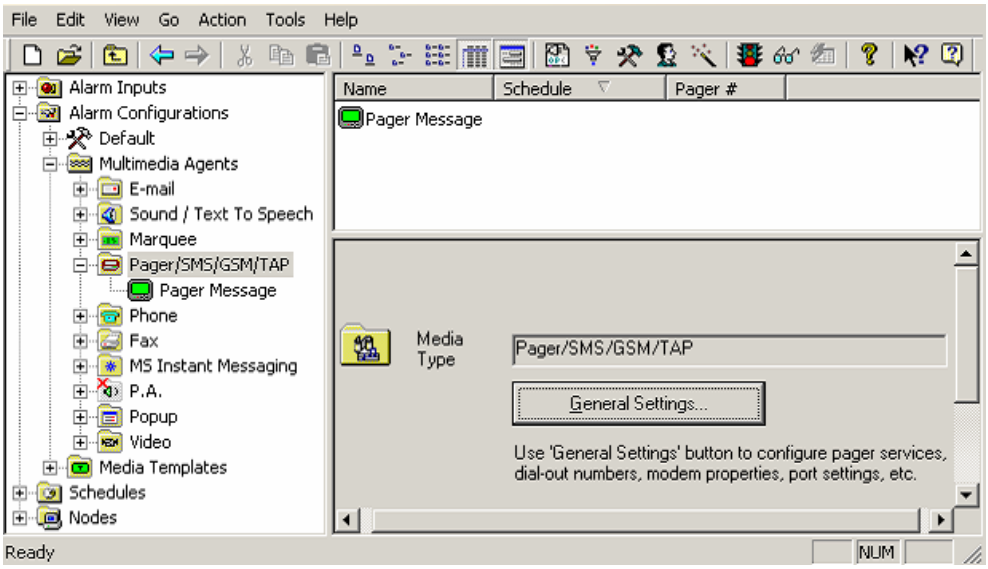


Figure A.2. Setting Up Pager Services

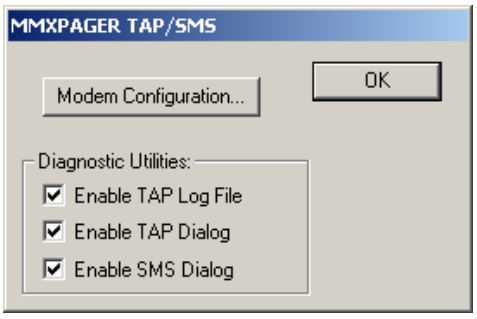


Figure A.3. TAP/SMS Diagnostic Utilities

6. Click on the **Defined Services** tab (labeled **Services** for GSM) and look to see if your service is listed. If it does appear in the list, you can select it. Click the **Properties** button to modify its parameters.

Note: The TAP and SMS dialog option will hold the MMXPager open until the dialogs are closed.

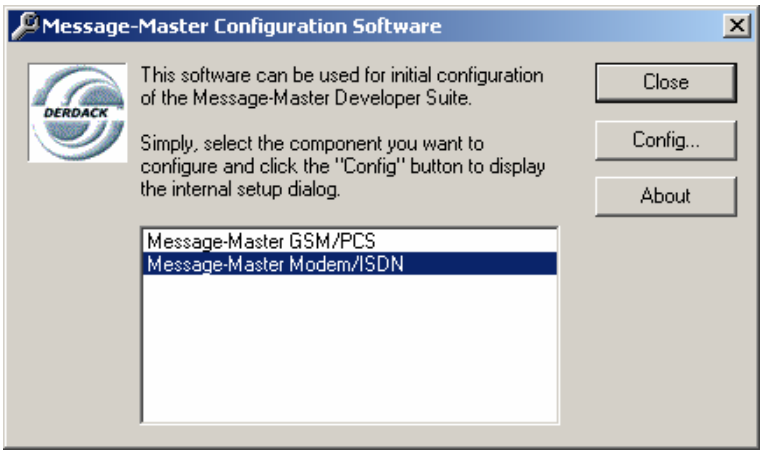


Figure A.4. DERDACK Message Master Configuration Dialog Box

A.3 TAP Configuration

This section covers the details of creating and modifying a TAP pager service. For details on SMS paging, see **Section A.4.** To configure TAP services, select the **Message Master Modem/ISDN** option (see Figure A.4), and then click the **Config...** button. The **TAP Configuration** dialog box will appear, as shown in **Figure A.5.**

1. On the **Dial Parameter and Modem Device** tab, shown in Figure A.5, configure the following parameters.

- **Location:** This is the location set when configuring the dialing rules (mentioned in the "Modem Configuration" section above.)
- **Device:** Select the device for the modem hardware.

  Note: We have found that many paging services (which must work with old technology modems for backwards compatibility) generally do not work with the out-of-the-box configurations of modern modems. Most often, the only change needed is to turn off the modem's **Error Control** features.

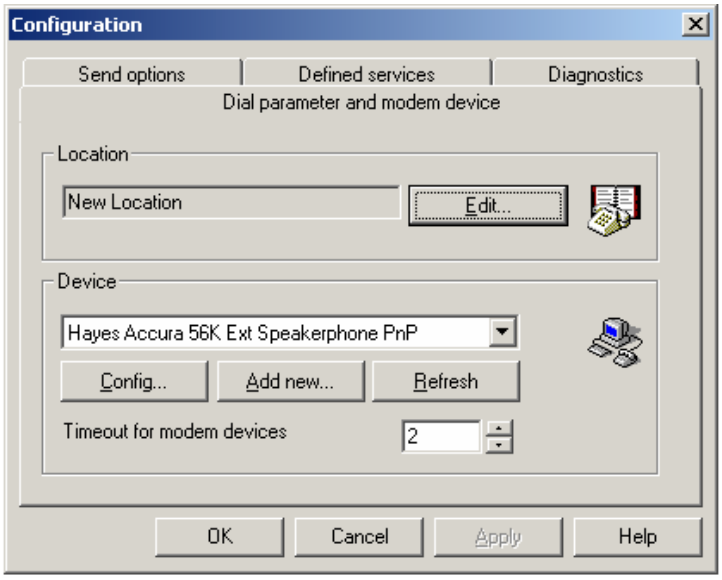


Figure A.5. TAP Configuration: Dial Parameter and Modem Device Tab

  This can be done with a Windows setting from the Control Panel. Conversely, some very old modems with max. Baud rates less than 9600 sometimes do not work well with the new Windows interfaces (TAPI) used by the MMX software. So make sure your modem is TAPI compliant. Test to see if it works with HyperTerminal.

- **Timeout for modem devices:** Select the re-initialization timeout for the modem (in seconds).

Note: The **Device Config..** button actives the Modem configuration used for the AlarmWorX Multimedia Pager Agent.

2. On the **Send Options** tab, shown in **Figure A.6,** configure the following parameters:
   - **Attempts for resending messages in error cases:** Select the number of times to retry in case of error.
   - Enable **Check messages for invalid characters.**
   - Check **Replace invalid characters automatically** if desired.

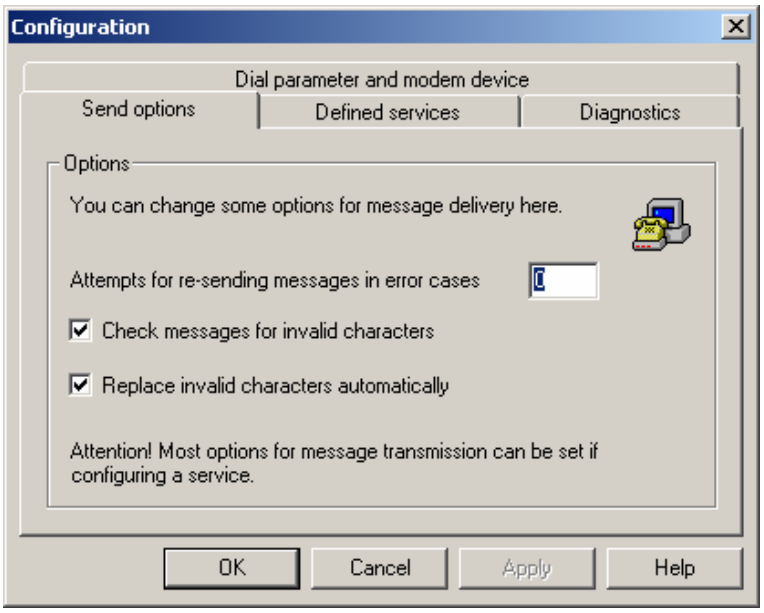


Figure A.6. TAP Configuration: Send Options Tab

3. On the **Defined Services** tab, shown in **Figure A.7,** check for your pager service provider. Verify that the service modem phone number is correct by selecting the service provider and clicking the **Properties** button. This opens the **Services** dialog box. The service provider number is located on the **Additional** tab in the **Number for dial-up terminal** field.

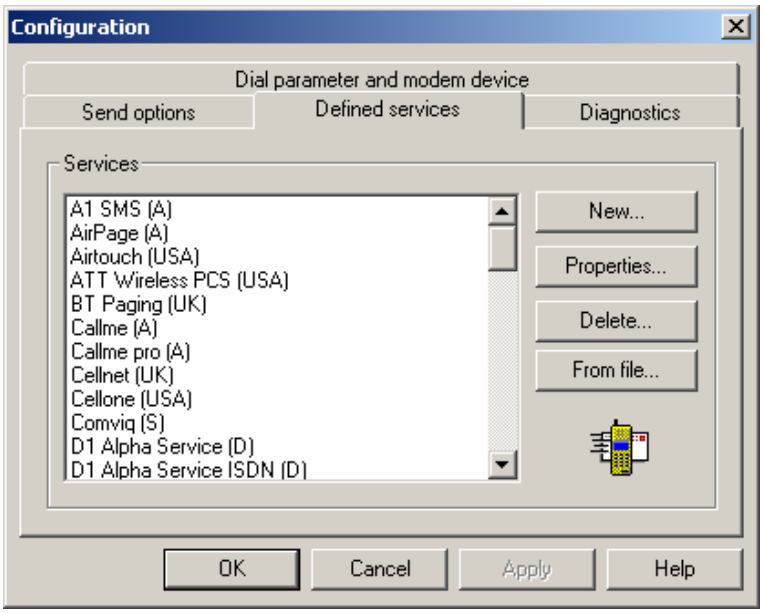


Figure A.7. TAP Configuration: Defined Services Tab

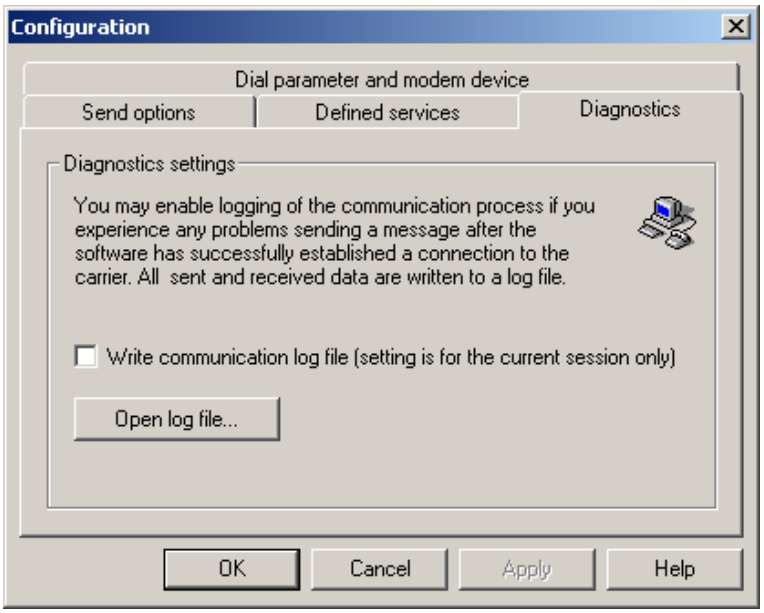


Figure A.8. TAP Configuration: Diagnostics Tab

4. On the **Diagnostics** tab, shown in **Figure A.8,** diagnostic support is available through the TAP dialog. The **Write communication log file** check box should not be used.

A.3.1 Setting up a New TAP Service

The standard Multimedia pager installation includes many of preconfigured TAP services. If your particular service is not listed, you can add it by following a few simple steps.

1. Launch the TAP configuration (as described above), and select the **Defined Services** tab, shown in Figure A.7.
2. If your service is not listed, click the **New** button.
3. On the **General** tab, shown in **Figure A.9,** configure the following parameters:
   - Enter a name for the new service.
   - Select **Message transmission based on data connections.**
   - Set the **Protocol type** field to TAP.
   - Pick a character set.

   Click the **Next** button to continue.

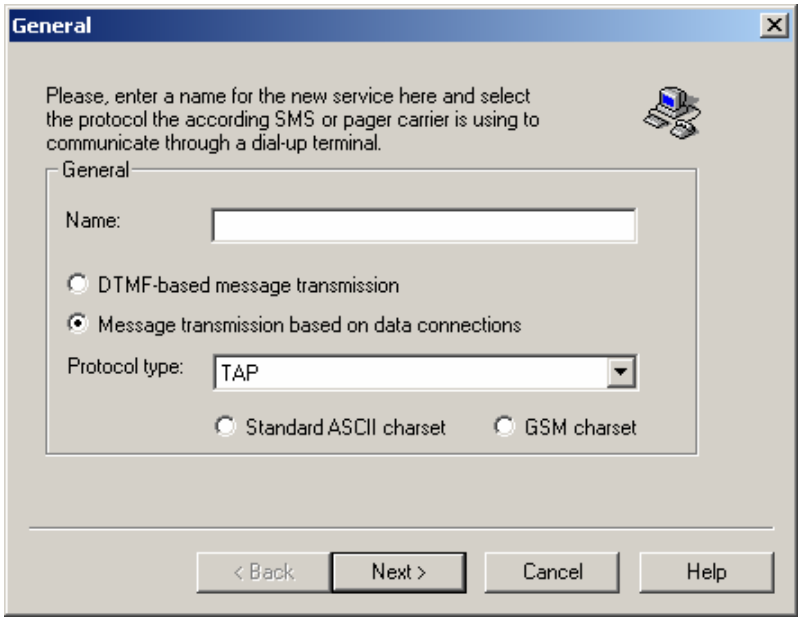


Figure A.9. Configuring a New TAP Service: General Tab

4. On the **Additional** tab, shown in **Figure A.10,** configure the following parameters:

- **Number for dial-up terminal:** Enter the service modem number. This is the phone number your modem will call to connect to the pager service provider. Your service provider will need to inform you of this number, which must be in TAP format. For the United States, the format is

  +1 (800) 2345678. The international format is +44 (215) 2345678.
- **Maximum message length:** Choose the maximum number of characters to display per message.
- **Password:** Not necessary
- **Calling zone:** Not necessary
- **Number of messages the carrier accepts at once:** 1

Click the **Next** button to continue.

Note: Find out (or simply test) whether your paging service can accept more than one message at a time. Quite often services do. Entering a number greater than one may result in fewer modem dial-outs when multiple paging

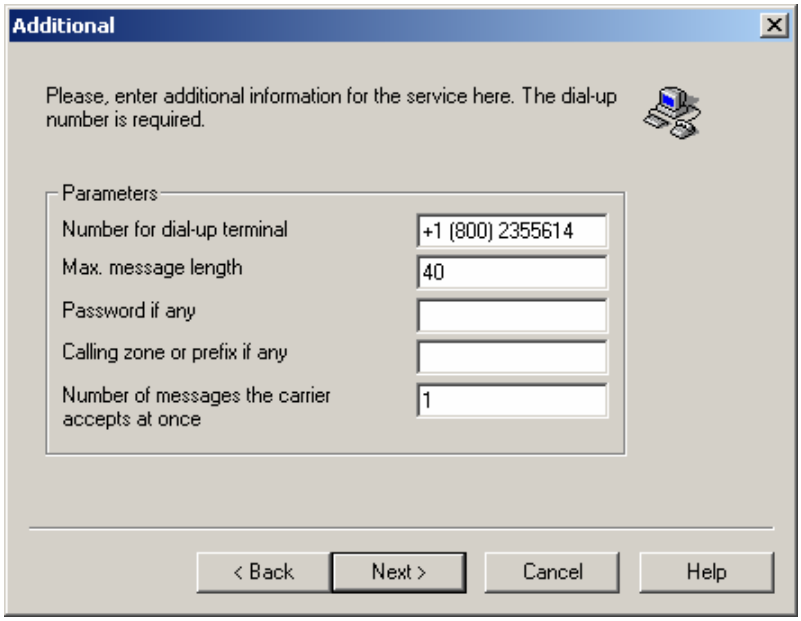


Figure A.10. Configuring a New TAP Service: Additional Tab

messages are queued up. In other words, if five messages have to be sent out over the modem, and this parameter is set to 1, it must dial out five separate times, once for each pager message. However, if this parameter is set to 5 and the paging service permits this, then only one dial-out session takes place, and all five messages are efficiently sent in that one phone call.

5. On the **Type** tab, shown in **Figure A.11,** configure the following parameters:

- Select the **Type** appropriate to the pager. Generally this is **Alphanumeric.**
- **UCP operation type:** This is not applicable.
- Check the **Breakup larger messages automatically** check box.
- **Maximum word wrap for breakup:** Generally, choose a number that evenly divides into the number chosen for the maximum message length (in the **Additional** tab shown in Figure A.10).

Click the **Next** button to continue.

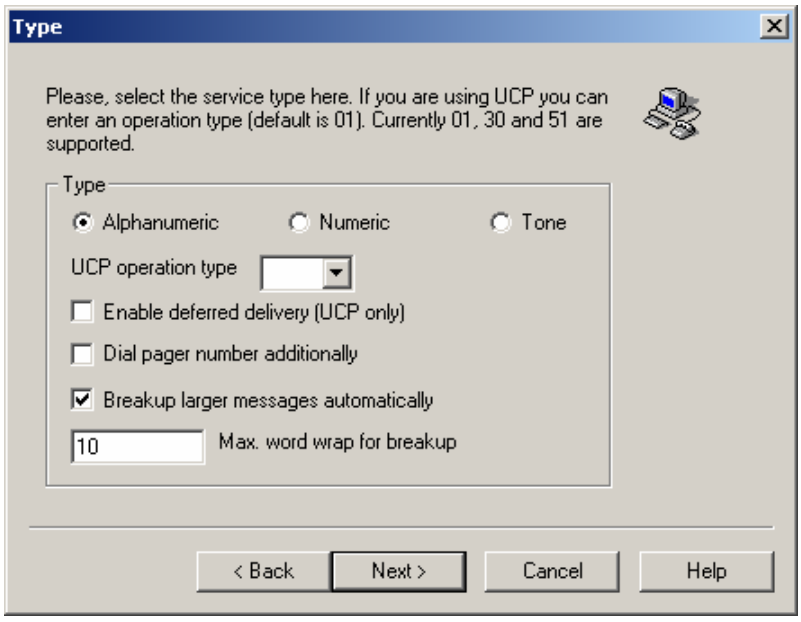


Figure A.11. Configuring a New TAP Service: Type Tab

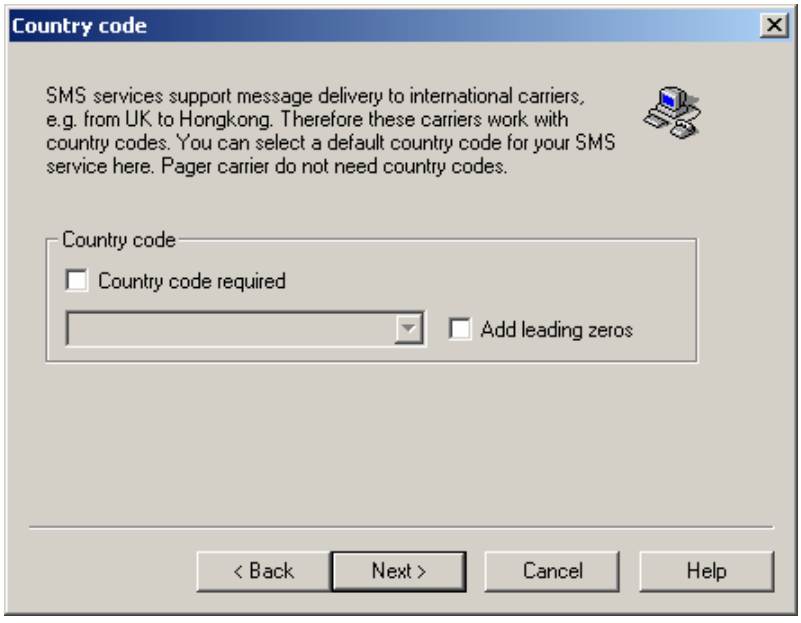


Figure A.12. Configuring a New TAP Service: Country Code Tab

In the Country Code **tab, shown in** Figure A.12, **enter a country code if applicable. Click the** Next **button to continue.**

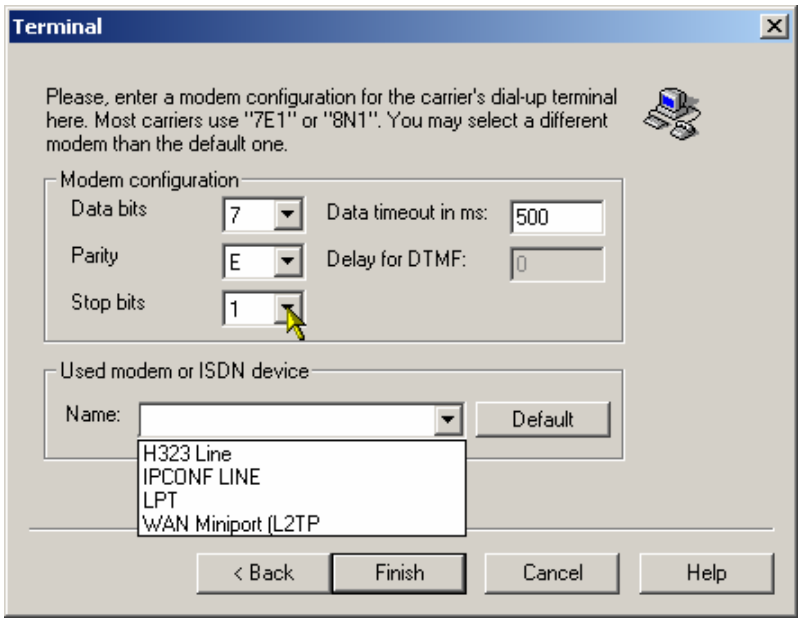


Figure A.13. Configuring a New TAP Service: Terminal Tab

6. On the **Terminal** tab, shown in **Figure A.13,** select the modem driver from the drop-down list under the **Used modem or ISDN device** field.
7. Click the **Finish** button to complete configuration of the new TAP service. Your new service is now available in the **Defined Services** list.

Note: While it is a good idea to configure this dialog, modem configuration is actually done by using the **Configure** button on the **Device** tab (see Figure A.5).

A.4 SMS Configuration

This section covers the details of creating and/or modifying an SMS pager service. If you are using TAP, then you can skip this section.

To configure SMS services, select the **Message Master GSM/PCS** option (see Figure A.4), and then click the **Config...** button. The **SMS Configuration** dialog box will appear, as shown in **Figure A.14.** On the **Services** tab, shown in Figure A.14, check for your pager service provider. Verify that the service modem phone number is correct by selecting the service provider and clicking the **Properties** button. This opens the **Service Properties** dialog box, shown in **Figure A.15.** For information about service properties, please see the "Setting up a New SMS Service" section below.

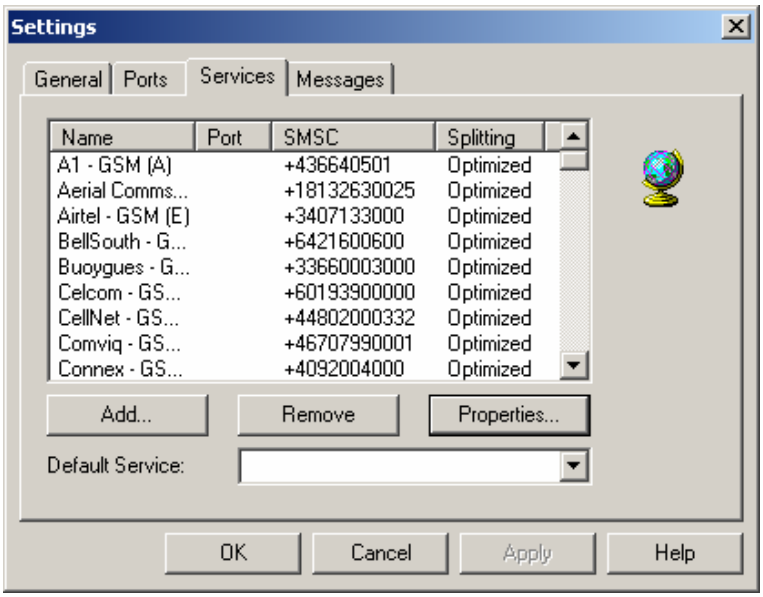


Figure A.14. SMS Configuration: Services Tab

Note: If a message window appears stating: "There is no port specified", then you must first add and configure a port to use for SMS paging via the **Ports** tab. You should have your SMS equipment connected to your appropriate COM port before completing the port configuration.

A.4.1 Setting up a New SMS Service

If your SMS service is not listed in the **Services** tab:

1. Click the **Add** button, as shown in Figure A.14. This opens the **Service Properties** dialog box, shown in Figure A.15.
2. On the **General** tab, shown in Figure A.15, configure the following parameters:
   - **Name:** Enter the name of the new service to be shown in the list of GSM/PCS services.
   - **Port:** Select the port the on which the GSM hardware is located.

     Note: If no port is configured, go to the **Ports** tab on the SMS Configuration **Settings** dialog box (see Figure A.14) and click the **Add** button to set up a port for GSM use.
   - **SMSC:** Enter the service modem number. Include a "+" before the first number.
   - **Default Country Code:** This is not applicable.
   - **Default Prefix:** This is not applicable.
   - **Resend Attempts:** Enter number of times to resend.

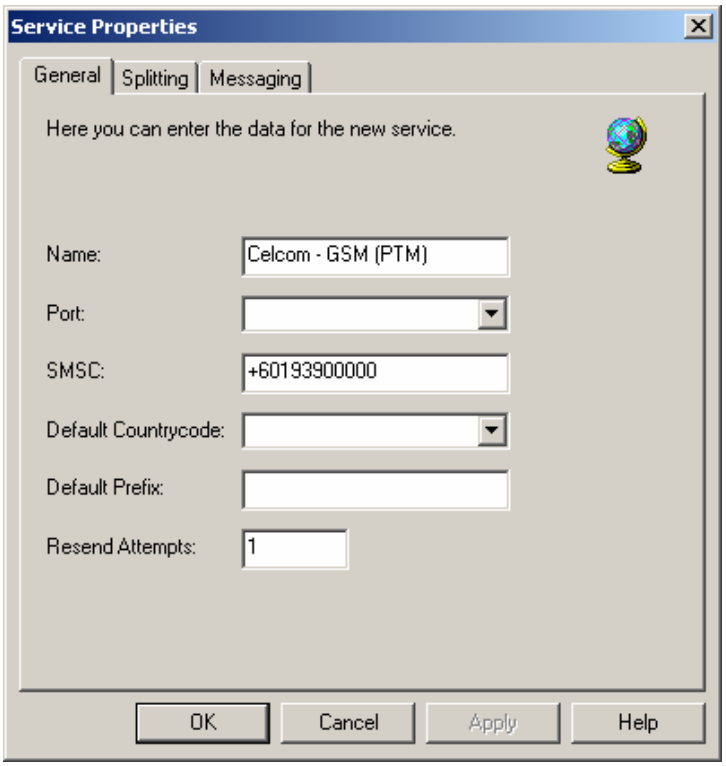


Figure A.15. SMS Service Properties: General Tab

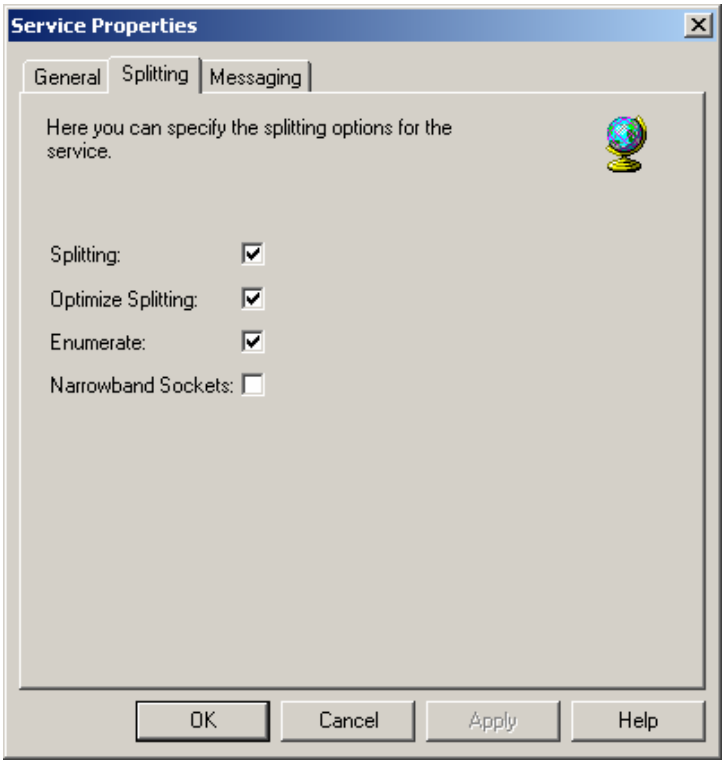


Figure A.16. SMS Service Properties: Splitting Tab

3. On the **Splitting** tab, shown in **Figure A.16,** check the **Splitting, Optimize Splitting,** and **Enumerate** check boxes.
4. On the **Messaging** tab, shown in **Figure A.17,** enter a string to add before the message (if this is necessary for your pager service).

5. Click the **OK** button. Your new service is now in the services list.
6. On the **General** tab of the **SMS Configuration** dialog box, check both the **Activate Outbox Spooler** and the **Activate Inbox Spooler** check boxes, as shown in **Figure A.18.**

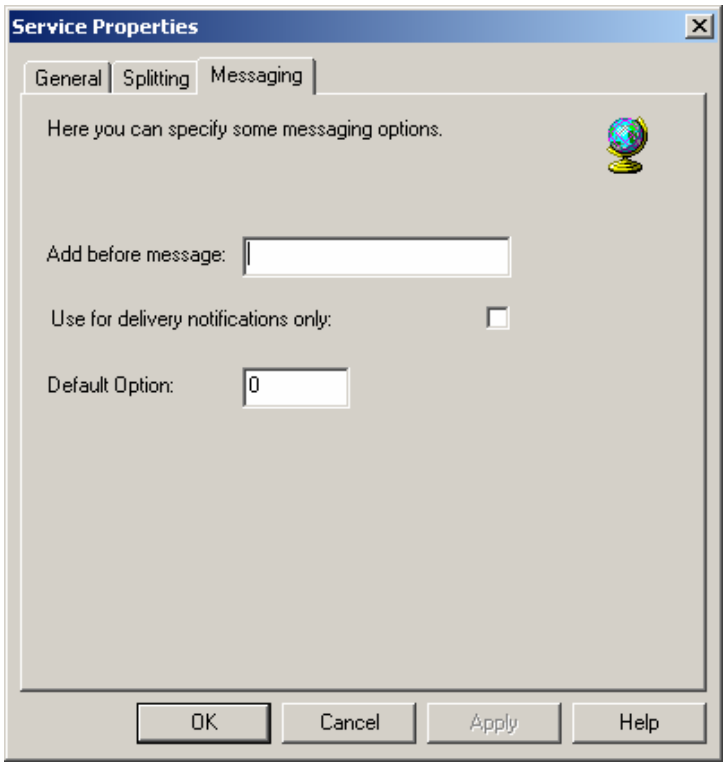


Figure A.17. SMS Service Properties: Messaging Tab

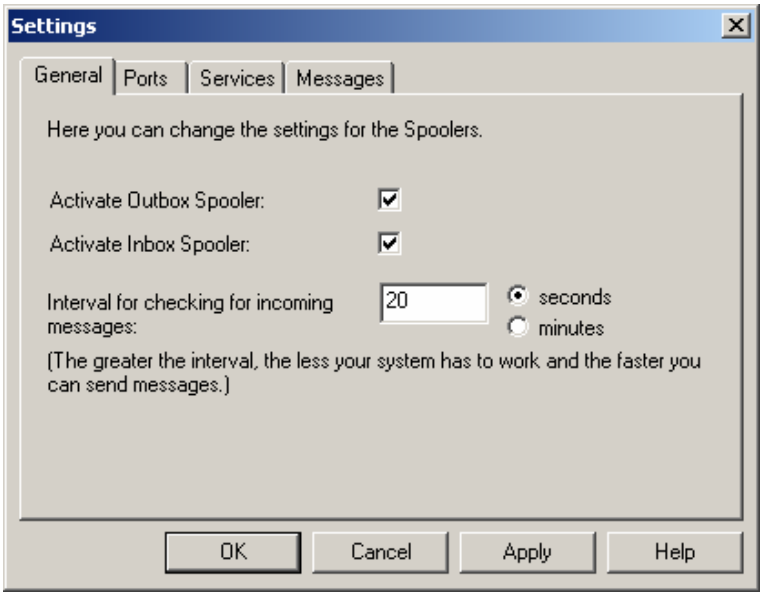


Figure A.18. SMS Configuration: General Tab

A.5 Pager Configuration Settings

Once you have properly set up your pager service, you can complete the Pager Agent configuration by using the following procedure. For more information about Pager Agent configuration fields, please refer to **Chapter 4.**

1. In the tree control in the left pane of the Multimedia Configurator screen, right-click **Pager/SMS/GSM/TAP** and select **New - Pager Contact** from the pop-up menu.
2. Enter the **Pager Media Name** in the configuration field in the right pane.
3. Enter the **Pager Number.** This is the phone number of the pager to contact, and is the same number you would use if you where paging from a touch-tone phone.
4. Select a template from the drop-down list.
5. If you are using a TAP pager, select **Use Modem/ISDN Service** and choose the service provider for your pager from the drop-down list. If you are using an SMS pager, select **Use GSM/PCS Service** and choose the service provider for your pager from the drop-down list. For an SMS Pager, also enter something in the **Acknowledge Code** field. This is used for "callbacks", when the user makes use of two-way paging to acknowledge an alarm message back into the system.

   Note: If a new pager service has been added, click the **Update Service List** button to display the service in the drop-down list. If your pager service provider is not listed, you will need to go back and follow the steps for setting up pager services.
6. Click **Apply** to save the changes.
7. To test your configuration without having to actually trigger an alarm, click the **TEST** button. If you experience problems in getting Multimedia to successfully send a page, enable the diagnostic dialog and/or log file to see where within the paging sequence the problem is occurring. If you chose to enable the diagnostic utilities (see Figure A.3) when configuring your pager services, the diagnostic dialog boxes will appear. The **SMS Diagnostic** dialog box is shown in **Figure A.19.** If you are using TAP and you chose to enable the TAP log file (in Figure A.3), you can view the log file by clicking the **Open Log** button in the **TAP Diagnostic** dialog, shown in **Figure A.20.**

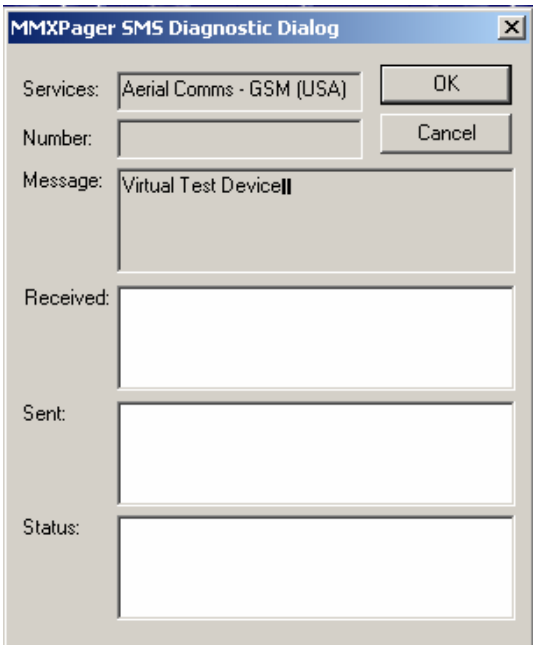


Figure A.19. SMS Diagnostic Dialog Box

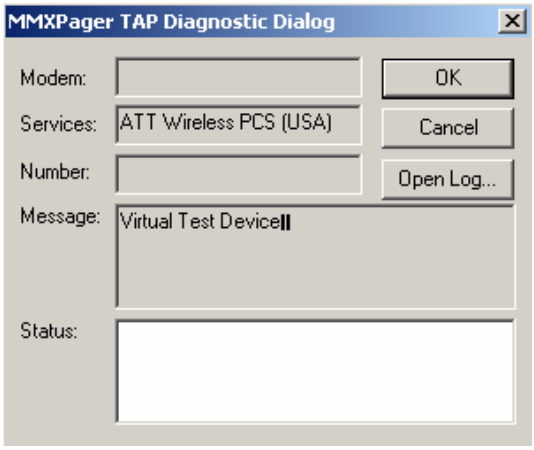


Figure A.20. TAP Diagnostic Dialog Box

Note: Status updates take place after the dial attempt. This does not affect single test cases. For multiple pages, the status information will often be one page behind the current page attempt.

A.6 Using the Multimedia Wizard for Pager Configuration

Perhaps the easiest way to configure the Multimedia software to send out a message to a pager when an alarm occurs is to use the **Multimedia Configuration Wizard**. The following example explains how to create a simple pager configuration using this wizard.

Note: You may also wish to explore the interactive **Multimedia Assistant** tutorial, which walks you through, using an animated talking teacher, the steps for creating alarm configurations. Choose **Multimedia Assistant** from the **Help** menu.

Note: If your paging service was not available in the list at installation time, or you did not choose a service, define a paging service now. Refer to **Section A.2** for details on how to define a service. This must be done before starting the wizard. Refer to **Chapter 2** for details about alarm configurations.

To start the Multimedia Configuration Wizard, click the button on the toolbar that looks like a magic wand starts, as shown in **Figure A.21.** (The wizard is also accessible from the **Tools** menu).

Figure A.21. Launching the Multimedia Configuration Wizard

The wizard will walk you through the following steps:

Step 1

The first step is to give this configuration a name, which will then appear in the left-hand tree control under **Alarm Configurations** once the wizard is complete. Each configuration can contain multiple action sets (described later) performing different types of multimedia notification (e.g., paging, voice, email, etc.), but is tied to just one OPC Alarm and Event Subscription (described in the next step). So, if you only have one alarm server, you will typically only need one configuration. Enter a name for identifying this multimedia configuration ("HVAC Alarms" in this example), as shown in **Figure A.22.** Click **Next** to continue to Step 2.

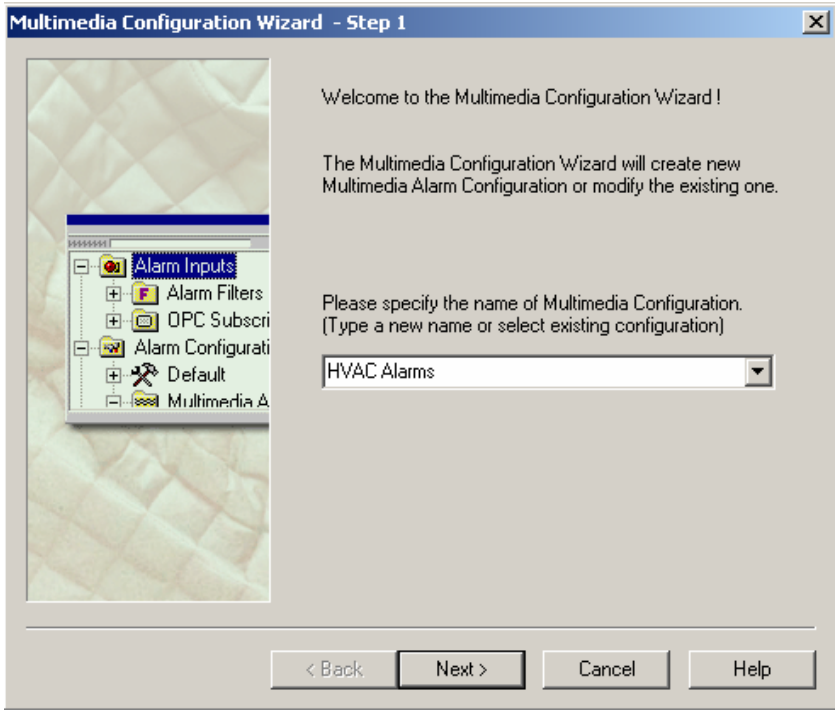


Fig. A.22. Naming the Alarm Configuration

Step 2

Step 2 specifies where alarms will come from. For Smar installations, this will typically be the Smar Alarm OPC Server, or possibly the SmarModbus OPC Server Version 3.05.

Basically the Multimedia Server subscribes to the OPC Alarm and Event server and receives all alarms made available by that server. The Multimedia Server will then use the alarm filters to select subsets of these alarms to determine the messages for which paging messages will be sent.

This is the same "subscription process" as is used for the Alarm Viewer ActiveX control to view the list of active alarms. For further details about subscriptions, please review the AlarmWorX documentation that came with your ProcessView software. Also refer to **Chapter 2,** or see the **Alarm Subscription** section later on in this appendix.

For this example, we will simply select the **Smar Alarm OPC Server** subscription already created in the database installed from the CD. Select **Use Existing OPC Subscription** and choose the appropriate one from the drop down list, as shown in **Figure A.23.** Then click **Next** to skip to Step 4.

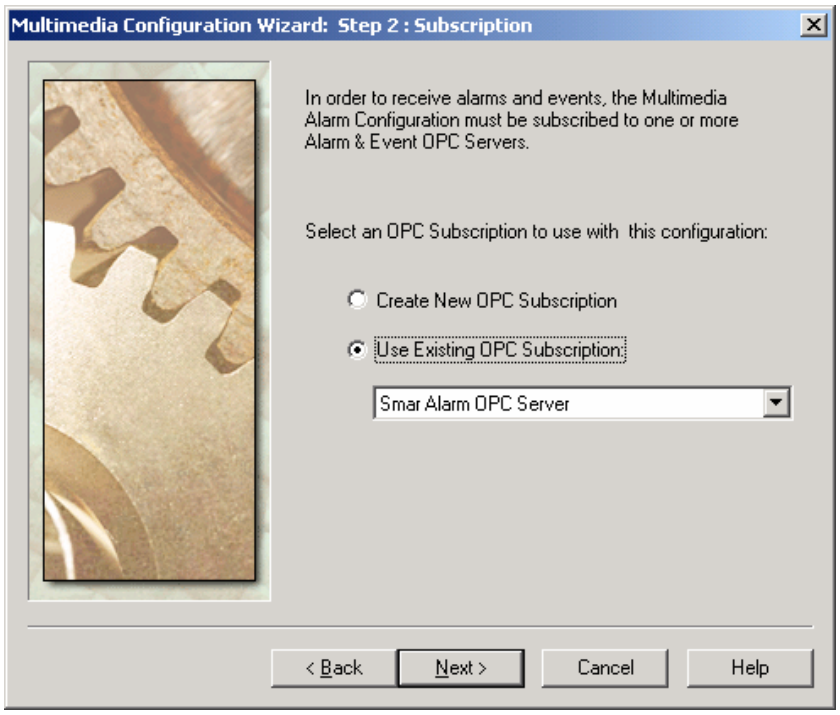


Figure A.23. Creating a Subscription Set

Step 3

Step 3 is shown only if you elected to create a new OPC alarm subscription in Step 2. Since you chose an existing alarm subscription, this portion of the wizard is skipped. For details on creating a subscription outside the wizard, please refer to **Chapter 2,** or see the "**Alarm Subscriptions"** section later in this appendix.

Step 4

In Step 4, the wizard helps create what is known as an alarm **Action Set.** This is a set of actions that the Multimedia Server will take whenever an alarm from that subscription occurs. For example, one action set could not only page the security guard, but it could also send an e-mail message to the technician on duty, announce the message over a P.A. system, and fax the alarm to a remote center. Here we will simply set up one entry for paging.

Note: For more information about action sets, please refer to **Chapter 2.**

First, give this action set a name ("SendPage" in the example below). This name will appear in the tree under the alarm configuration once the wizard is complete.

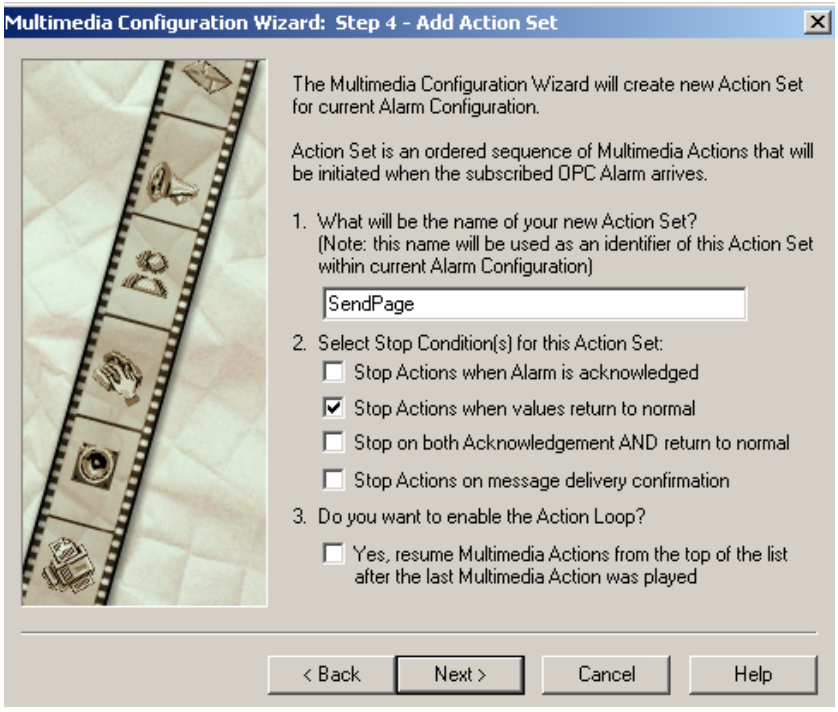


Figure A.24. Defining Action Set Parameters

Second, select what type of event will stop this action set from continuing through the list. For action sets with multiple notification options configured (as mentioned above) the progression through those actions will be interrupted by the stop condition, and the remainder of the actions will not be executed. For example, you could have the Multimedia Server stop sending messages once someone acknowledges the alarm, or perhaps when the alarm returns to normal. Simply check the appropriate box(es), as shown in **Figure A.24.**

Although there is also a third possible step shown for repeating the action set via the loop feature (e.g., keep paging someone every 20 minutes until the alarm returns to normal), this option will not be enabled for this action set.

Click **Next** to continue to Step 5.

Step 5

The wizard then permits you to add an **Alarm Filter** for this action set. While your OPC subscription may be receiving "ALL" the alarms generated by the OPC server, it is often necessary to specify which subset of those alarms will result in a message being sent to a pager. That's where an alarm filter is used. For example, you could set it up such that only HI ALARMS will send a pager message. Another filter might specify that only high priority alarms will initiate the sending of a pager message.

Please refer to **Chapter 2** for details about configuring alarm filters for Multimedia, or see the **Alarm Filters** section later in this appendix for more information on creating your own filters. For complete details on the use of alarm filters and how to construct them with the various OPC Alarm and Events servers, please consult the AlarmWorX documentation.

In this step of the wizard, you can either choose to create a brand new alarm filter, select an existing one, or forgo using any filter. For this example, select one of the default filters installed automatically from the CD. So, select the second option **I want to use existing Alarm Filter,** as shown in **Figure A.25.**

Then, select from the drop-down list the filter labeled **Radiation Level.**

Click **Next** to jump to Step 7. (Step 6, for creating new filters, is skipped).

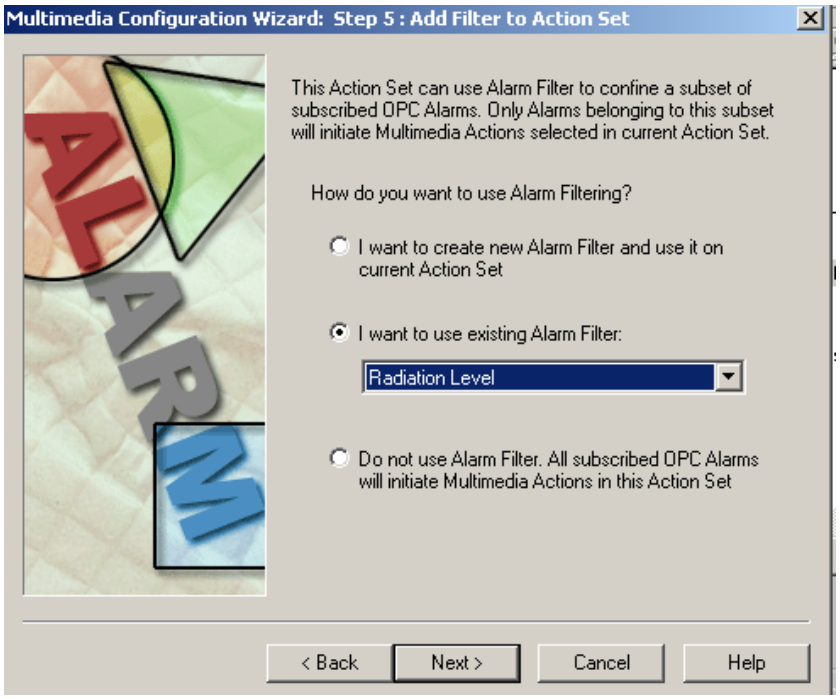


Figure A.25. Choosing an Alarm Filter for the Action Set

Step 6

Step 6 is for configuring a new alarm filter, and is skipped in this example because an existing filter was selected in Step 5. Refer to Chapter 2, or see the **Alarm Filters** section later in this appendix for more information on creating your own alarm filters for use within Multimedia.

Step 7

Each action set can actually execute multiple multimedia notification methods. For example, when an alarm occurs you can configure Multimedia to first announce the alarm over the local P.A. speaker system, and then send out an alphanumeric pager message, then send out an e-mail message to five people, and then send a fax to a remote site — all triggered by the same alarm.

Note: Only those multimedia agents selected during the installation process will work.

The wizard walks through setting up each action within the action set. For purposes of this example, we will only define one action within this action set: that of sending out a message to a pager.

Make sure **Sending pager message** is selected in Step 7, as shown in **Figure A.26.** Then, click **Next** to continue on to the next step.

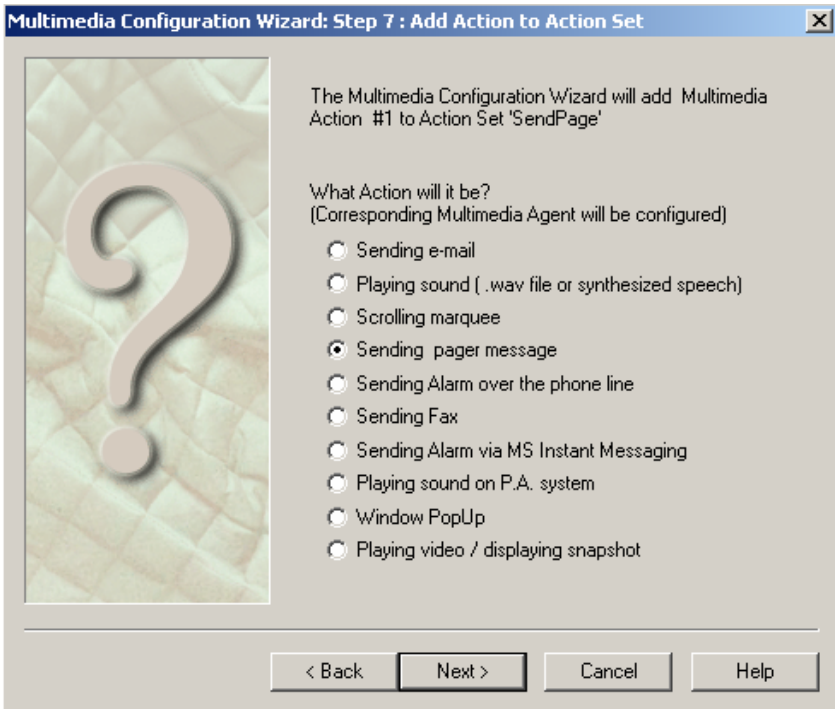


Figure A.26. Selecting Paging Action

Step 8

Step 8 of the wizard lets you choose to either use an existing Pager Agent definition or to create a new one. A Pager Agent defines to whom the message should be sent (e.g., the security guard's pager number), and identifies the paging service protocol to use (e.g., PageNet service).

For this example, we will walk through creating a new Pager Agent, so select **Yes, create new Pager/SMS/GSM/TAP Agent configuration,** as shown in **Figure A.27.**

Then click the **Next** button to continue to Step 9.

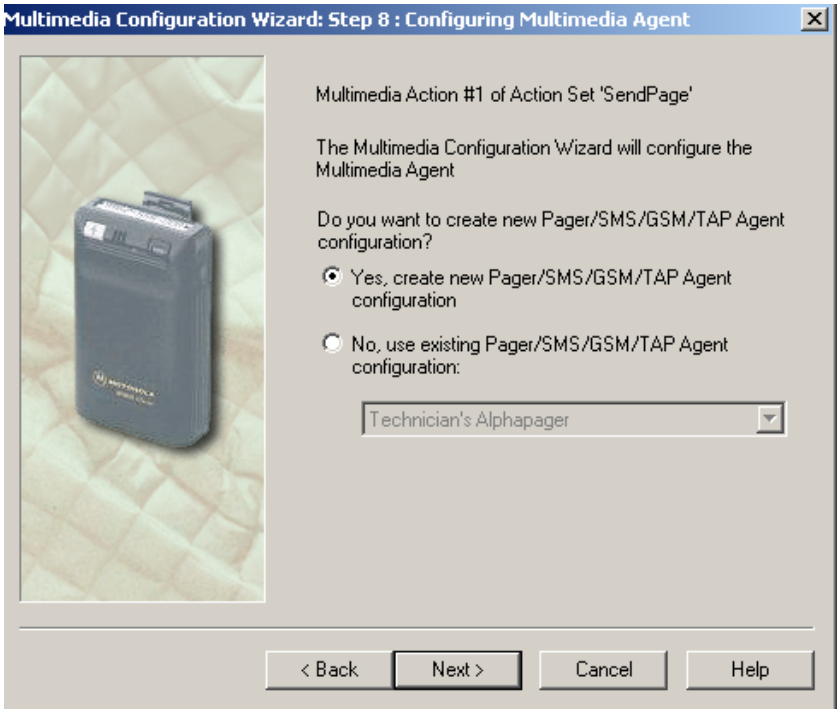


Figure A.27. Creating a New Pager Agent

Step 9

Step 9 of the wizard defines the Pager Agent settings.

First, enter a name to identify the pager recipient. This name will be used to identify this Pager Agent in the left-hand tree control under the Paging section once the wizard is complete.

Next, select whether the pager message will be sent via GSM/PCS (for SMS type paging, popular in Europe and other areas around the world) or Modem/ISDN (for TAP paging, popular in the US and around the world).

Select which paging service should be used from the drop-down list, as shown in **Figure A.28. Note:** If your paging service is not listed here, select one of the services provided anyway for now. Refer to **Section A.2** for information about how to add new paging services to the Multimedia configuration.

Finally, enter the Pager ID number associated with this person. This may or may not be the same ID that you would normally use when dialing a numeric beeper from a phone. Some paging services assign a different personal identification number (PIN) to pagers for use when alphanumeric messages are being sent via software (such as Multimedia) rather than just simple touch-tone keys on the phone. Contact your paging service provider for details.

Note: Please refer to **Chapter 4** for details about Pager Agent configuration settings.

Click **Next** to continue to Step 10.

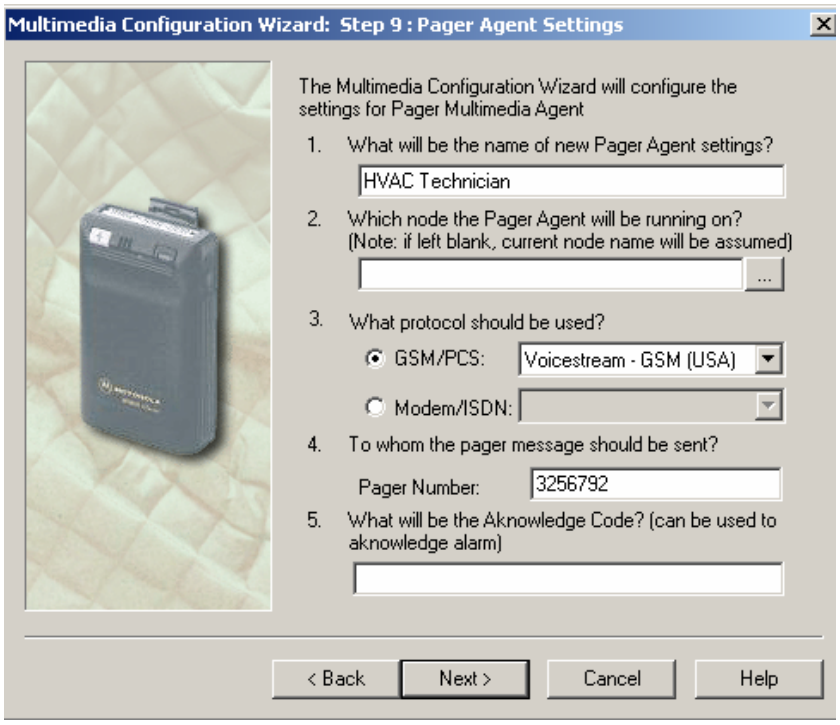


Figure A.28. Filling out the Pager Information

Step 10

A **Media Template** defined within Multimedia determines the actual message that gets sent to configured pagers. You can select whether the message includes the timestamp of the alarm, the tag name that generated the message, the actual alarm message itself, and many other parameters. Multimedia already comes with a template created for sending alphanumeric pager messages.

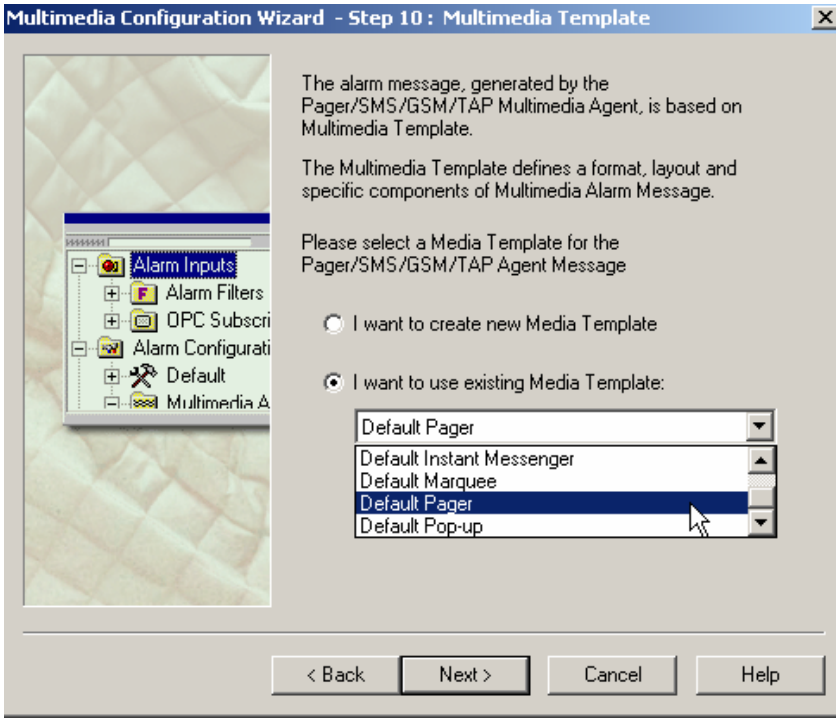


Figure A.29. Using the Alarms Template to Define the Message

For this example, simply select the option **I want to use existing Media Template.** Then, make sure the **Default Pager** template is selected from the drop-down list, as shown in **Figure A.29.**

Click **Next** to continue to Step 12.

Step 11

Step 11 (defining the media template) is skipped in this example, since an existing template was selected in Step 10 above. Please refer to **Chapter 5** for information about creating new media templates.

Step 12

Step 12 of the wizard permits you to define additional actions to be taken within this action set. As noted earlier, this can be used to have Multimedia also announce the same alarm message over a speaker, send e-mail messages, and more.

For purposes of this example, select **No, I don't want to add any more Actions to Action Set 'SendPage,'** as shown in **Figure A.30.**

Click **Next** to continue to Step 13.

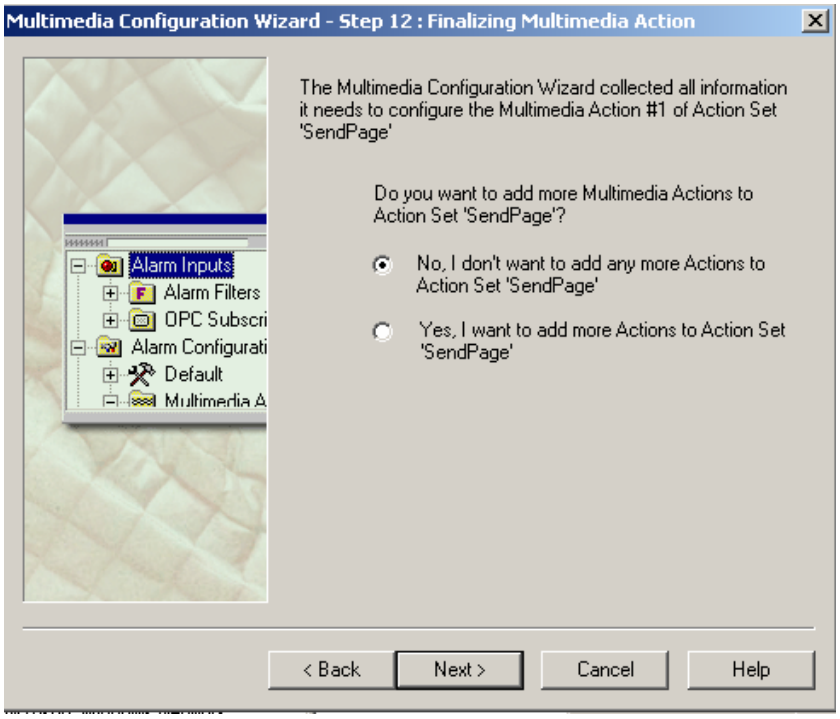


Figure A.30. Finalizing the Action Set

Step 13

The action set is now complete. The wizard now permits you to add additional action sets with different notification methods and recipients to be defined. For purposes of this example, select **No, I don't want to add any more Action Sets,** as shown in **Figure A.31.**

Click **Next** to continue to Step 14.

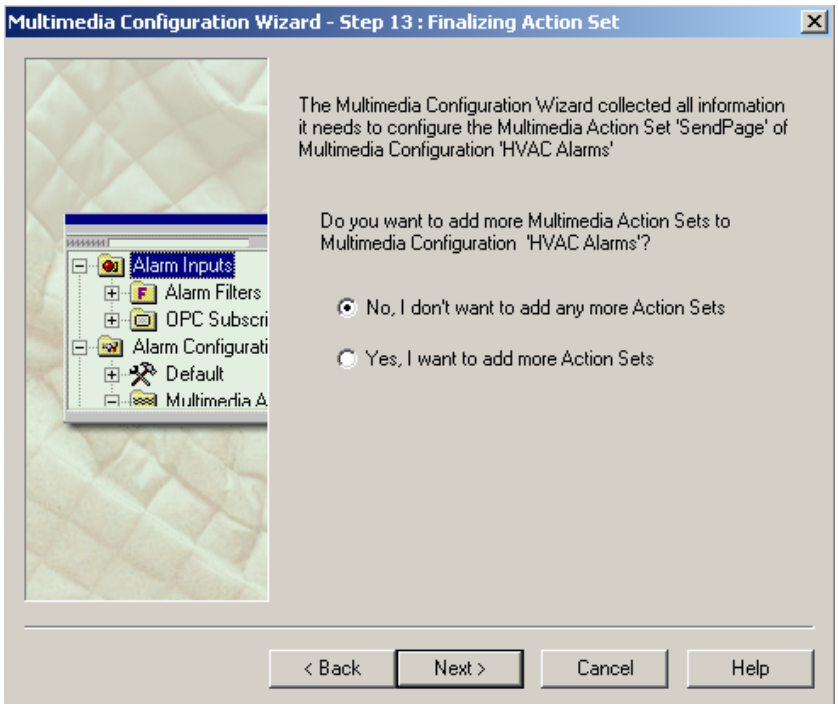


Figure A.31. Finalizing the Action Sets

Congratulations! The wizard is now complete. Click **Finish** to save the changes to your configuration, as shown in **Figure A.32.**

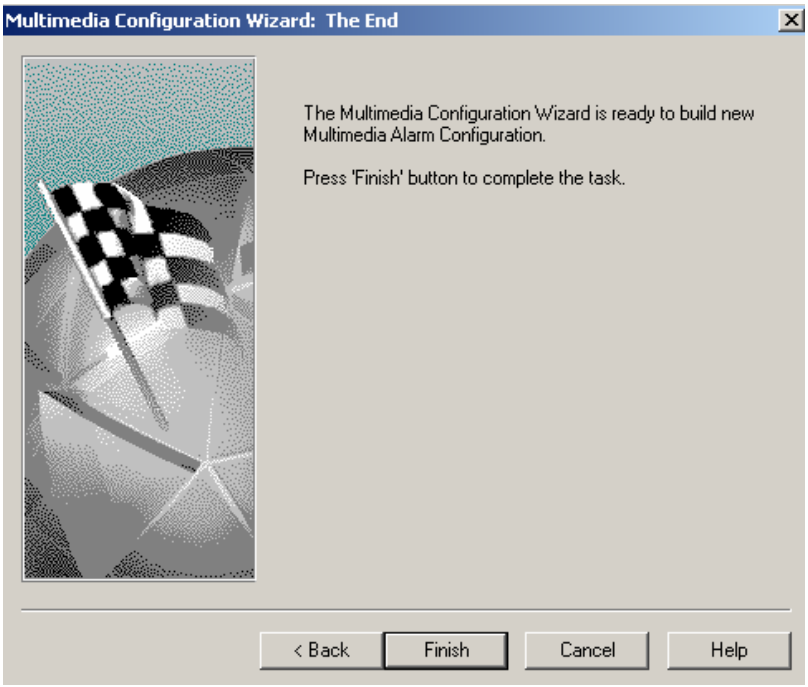


Figure A.32. Finished With the Wizard

A.6.1 Viewing the New Alarm Configuration

The configuration information is automatically saved to the .mdb database file (Microsoft Access database file). Expanding the **Alarm Configurations** folder in the left-hand tree control of the Configurator shows the newly added **HVAC Alarms** configuration, as shown in **Figure A.33.** Expanding that shows the **SendPage** action set just created using the wizard. Clicking on the **SendPage** item will show its details on the right-hand side of the window, as shown in Figure A.33.

In this action set, only one action is shown in the action set table: that of sending a message using the Default Pager media template to the HVAC Technician. And it only will do this for "Radiation Level" alarms.

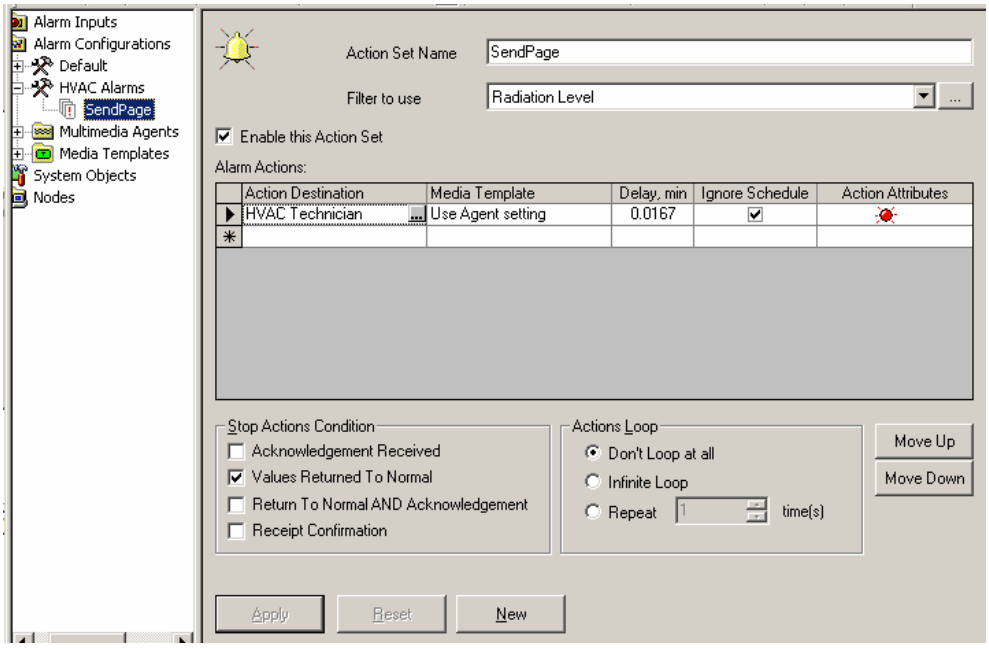


Figure A.33. Action Set Configuration Information

To view details on the configuration of the pager recipient configured in the wizard, expand the **Multimedia Agents** folder in the tree control, and then expand the **Pager/SMS/GSM/TAP** tree. Click on the **HVAC Technician** item, as shown in **Figure A.34.** Its details are then shown on the right-hand side of the display. Here you can see the paging number defined during the wizard, as well as the paging service selected.

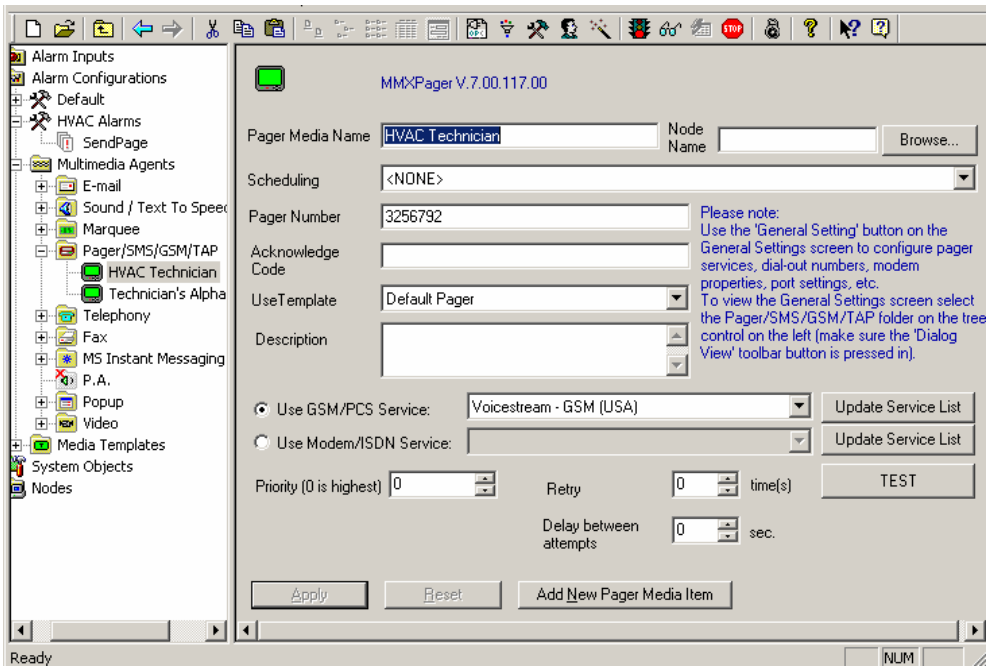


Figure A.34. Pager Configuration Information

The **TEST** button, shown in Figure A.34, can be used to verify that the paging service, modem, pager number, and other such parameters are correct before attempting to trigger pager messages based on actual alarms. It helps separate issues of alarm subscription versus pager setup when troubleshooting a system for the first time.

Other advanced options are available within Multimedia, including scheduling and roles. For example, you can assign a complex schedule (complete with vacation time, recurring patterns, excluded periods, etc) and have an action set use that schedule when determining whether someone should be notified. If you do assign a schedule to an agent, make sure the **Ignore Schedule** checkbox is NOT checked in the action set table. For details about configuring schedules and roles, please refer to **Chapter 6.**

A.6.2 Starting the Multimedia Server

To make the Multimedia Server use the setup information entered in the Configurator, the Server must be placed into "runtime" mode. To start/stop the server, click the stoplight button on the toolbar, as shown in **Figure A.35** and **Figure A.36,** (or choose **Start Multimedia Server** from the **Action** menu).

Figure A.35. Multimedia Server Toolbar Button – Server Stopped

Figure A.36. Multimedia Server Toolbar Button – Server Running

The Multimedia Configurator also offers a Monitor View for observing the triggering of multimedia actions by the Multimedia Server. To turn this on, either click on the Monitor button (looks like eye glasses) on the toolbar, or select **Monitor View** from the **View** menu.

A.7 Alarm Filters

As discussed in Step 5 of the Multimedia Configuration Wizard, the Multimedia Server receives all alarms subscribed to, and it uses alarm filters to narrow down the list to specify which subset of alarms will be used to initiate a multimedia action. For example, one filter could specify that only HI ALARMS will send a page, while another filter might specify that only high priority alarms will initiate the sending of a page.

Note: For details about creating alarm filters and expressions, please refer to **Chapter 2.**

A.7.1 Creating a New Filter

This section walks through how to add a new filter to your Multimedia configuration.

1. Expand the **Alarm Inputs** folder in the left-hand tree control of the Multimedia Configurator, and then expand the **Alarm Filters** folder. This shows all of the filters already defined in your system, as shown in **Figure A.37.**

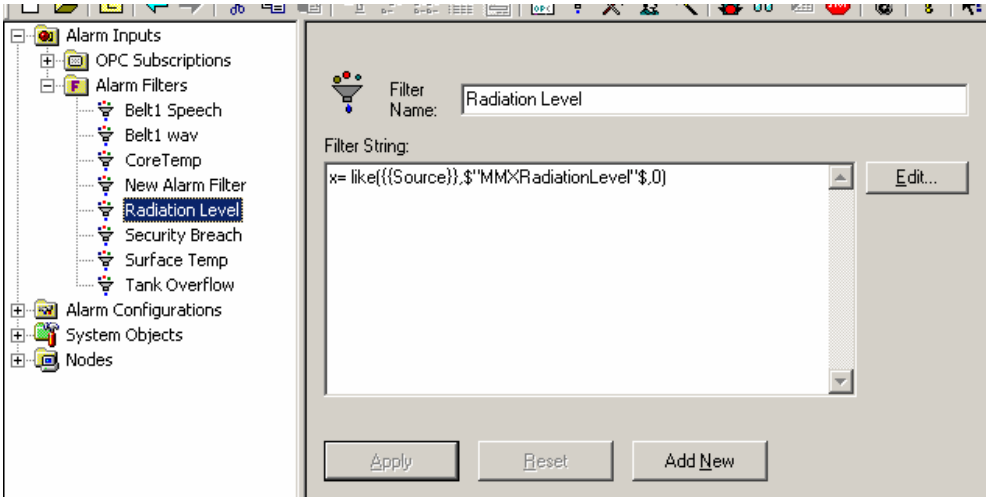


Figure A.37. Alarm Filters in the Multimedia Configurator

2. Right-click the **Alarm Filters** folder and select **New - Alarm Filter** from the pop-up menu (or select from the **Edit** menu). A new filter is inserted into the list.
3. Enter a name that adequately describes the alarm filter being created. For this example, we will set up an alarm filter that will trigger our **Send Page** action set only when an alarm with a Priority (Severity) greater than or equal to 500 occurs. So enter as the name: **Just Priorities (Severities) >= 500**.
4. Click the **Edit** button. The alarm filter **Edit Expression** dialog box appears, as shown in **Figure A.38.**

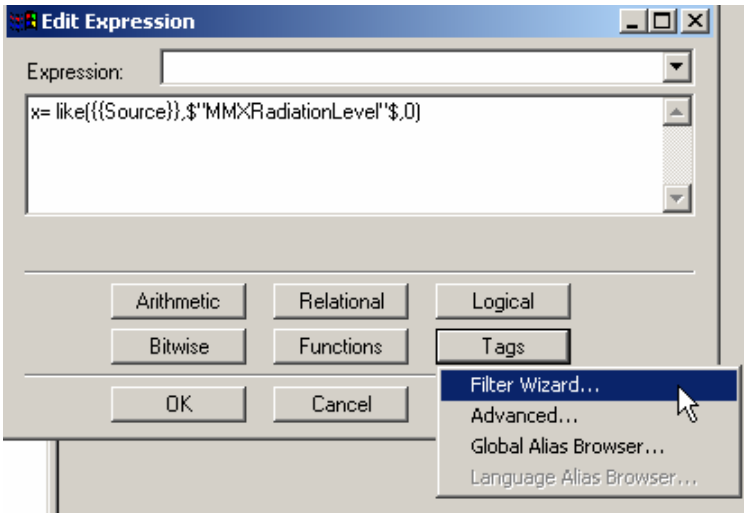


Figure A.38. Alarm Filter Expression Editor and Filter Wizard Selection

5. Click the **Tags** button, and then select **Advanced** from the pop-up menu, as shown in Figure A.38. This shows a listing of all possible alarm attributes for use in your filter.
6. Select **Severity** from the **Alarm Tag** window, as shown in **Figure A.39,** and then click **OK.** Note that the filter wizard then inserts into the Expression Editor workspace the necessary filter "code" of: ***{{Severity}}***

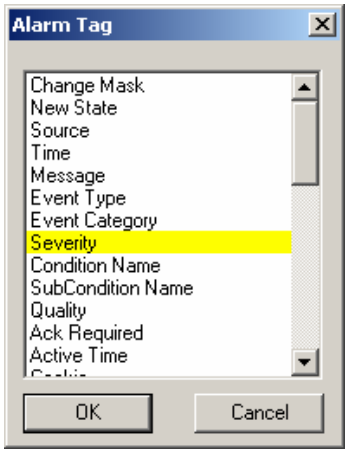


Figure A.39. Alarm Attributes for Use in Filters

7. To finish the filter, click on the **Relational** button and choose **>= Greater Than or Equal.** Next, type in **500.**

   Note: You did not necessarily have to click on all the buttons. You could have simply typed in the expression: **{{Severity}} >= 500** directly in the text field. However, using the buttons helps make sure the syntax is correct.

8. Click **OK** to complete this filter. (**Note:** The expression editor will add an "**x=** " in front of the expression to complete it for you). Your final alarm filter should appear as shown in **Figure A.40.**

9. Finally, click the **Apply** button to save this filter. It then gets placed alphabetically in the tree control, as shown in Figure A.40. It may now be used in the action set to limit which alarms will trigger the action(s).

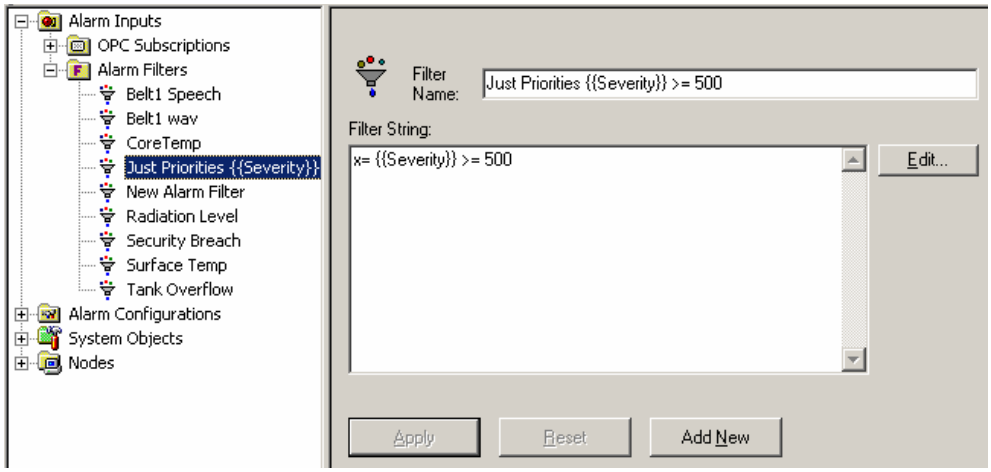


Figure A.40. Completed Alarm Filter

A.7.2 Using Alarm Filters

If you have a lot of alarm filters to create and use, you may elect to create them en-mass by first exporting an existing one (as a "template") by selecting **Export CSV** from the **File** menu. You can then use a spreadsheet, word processor, or other tool to replicate and create more filters. Then simply re-import those filters into Multimedia.

If desired, you can remove all other references in the CSV file, and only work on the **#MMX_Filter** section. That way when you import that CSV file, only those filters are brought into your system.

The filters can then be applied to each action set defined in your Multimedia configuration.

A.8 Alarm Subscriptions

As mentioned earlier, the Multimedia Server subscribes to other alarm systems for current status information. Unless you are creating multiple subscriptions for many sites, or are networked to the machine running the OPC Alarm and Event server, the default subscriptions that were installed with Multimedia from CD should suffice.

However, if you need to create your own subscription to an alarm server, this section will walk you through the basics within the context of the Multimedia System. For complete details, you must consult the documentation that came with your alarming system. Also refer to **Chapter 2** for more information about creating subscriptions.

1. Expand the **Alarm Inputs** icon in the left-hand tree control of the Multimedia Configurator, and then expand the **OPC Subscriptions** folder. This shows all of the alarm subscriptions already defined in your system.

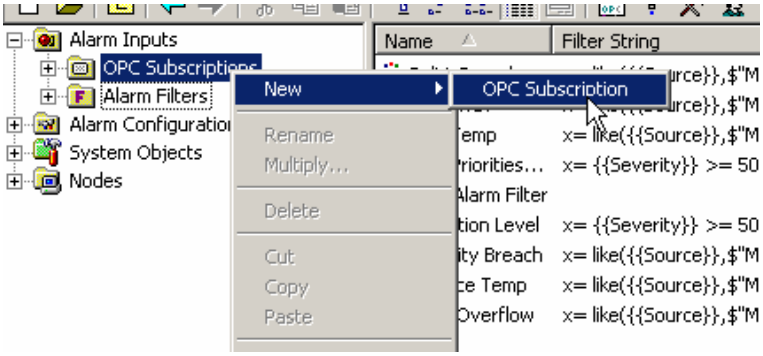


Figure A.42. Inserting a New Alarm Subscription

2. Right-click the **OPC Subscriptions** folder and select **New - OPC Subscription** from the pop-up menu, as shown in **Figure A.42** (or, select from the **Edit** menu). A new subscription is inserted into the list.
3. In the **Subscription Name** field, enter a name to identify the types of alarms coming from this alarm subscription (e.g., "All Alarms from Buildings 2 & 3"). This name will be used when you assign a subscription to an alarm configuration.
4. Click on the **Subscribe/Edit** button. This opens a **Subscriptions Properties** window for defining the alarm subscription, as shown in **Figure A.43.**

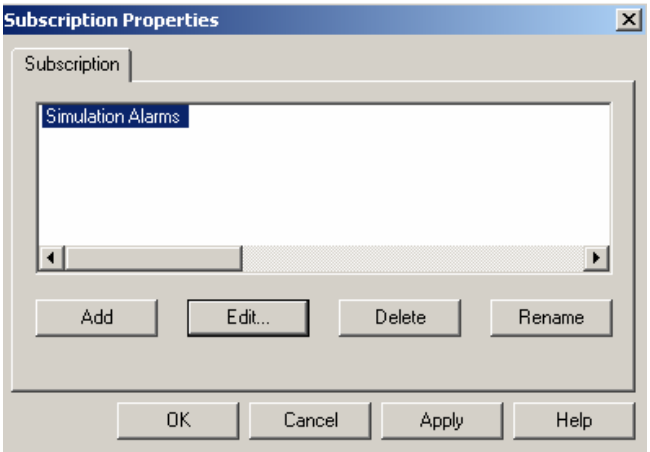


Figure A.43. Adding a New Subscription

5. Each alarm subscription can actually contain links to multiple OPC Alarm and Event servers (e.g., you may need to link into both the Smar Alarm and Event Server as well as the Modbus Server in order to get all alarms in your system).
6. To add a link, click the **Add** button. Give the new entry a name. (This name will not appear or be used anywhere else; it is just a way of identifying this OPC Alarm and Event Server link).
7. Click the **Edit** button. Another pop-up window appears, allowing you to define the specific OPC Alarm and Event subscription.
8. Click the **Browse** button and navigate to the appropriate OPC Alarm and Event server typically found in the "My Computer / Alarm & Event" path (unless you want to connect to a server on another PC on your network). Highlight the desired Alarm and Event server, as shown in **Figure A.44.**

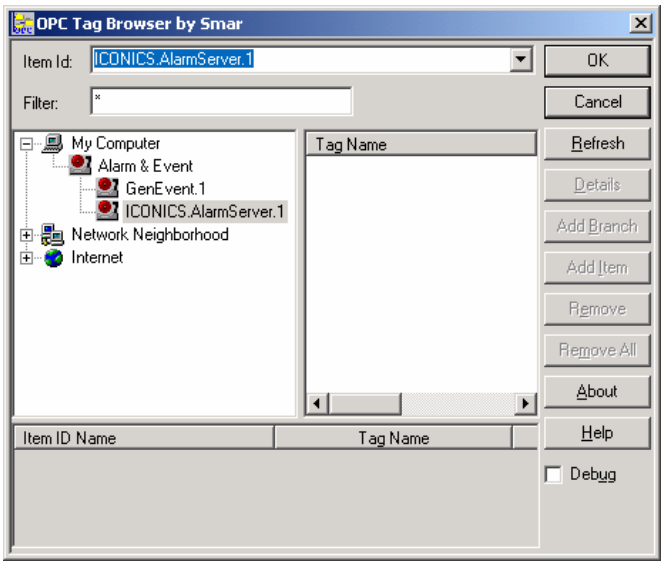


Figure A.44. Selecting an Alarm and Event Server

9. The selected server will now appear in the **Event Server** field of the **Event Subscription** dialog box, as shown in **Figure A.45.**

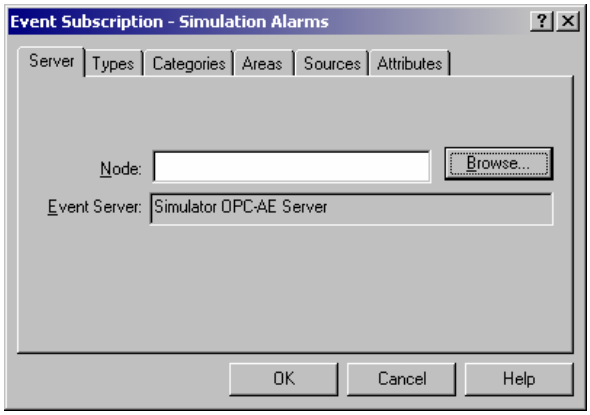


Figure A.45. Defining the Alarm and Event Subscription

While for this example it is not necessary to modify any of the details in any of the other tabs shown in this dialog box (hence all alarms will be delivered to Multimedia for notification), we will quickly go over two example settings that may prove useful.

10. First, click on the **Categories** tab. If no categories appear in the right-hand **Subscribed** list, then "all" categories are used. However, adding **Digital** to the list tells the OPC Alarm and Events server to deliver only those alarm messages to Multimedia. This is a "first-pass" filter on the server side. With this setup, none of the Analog Limit alarms will be sent to the Multimedia Server, freeing up the communication traffic. Again, do this only if you just want digital alarms (otherwise leave this blank to subscribe to "all" alarms).

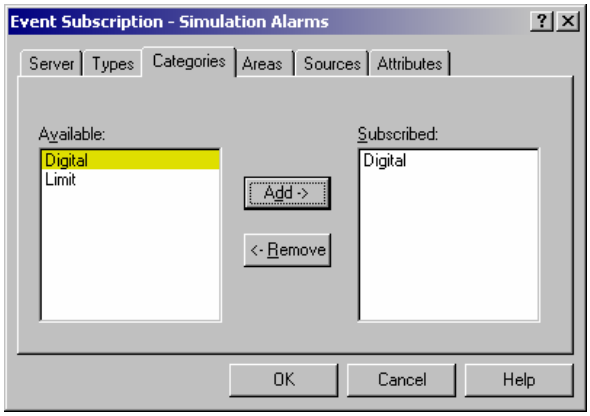


Figure A.46. Alarm Server Categories

11. Click on the Attributes tab, shown in Figure A.47. Here you can tell the OPC Alarm and Events Server to send additional information about each alarm. For example, in Figure 4.47 the ACK COMMENT field has been added as Attribute 1. This will permit any comments the operator added during the alarm acknowledgement process to also be available to your multimedia templates for the notification messages to be sent out.

Note: You must do this for each event category you are subscribed to in order for it to be available for each alarm type.

12. Click **OK** in the **Event Subscription** dialog box.

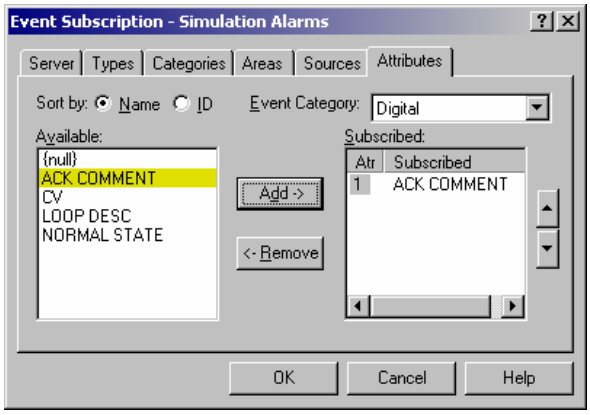


Figure A.47. Additional Attributes for Alarm Server

13. Click **OK** in the **Subscription Properties** dialog box to return to the Configurator screen.

14. Click **Apply** to save your changes to the database.

Note: To learn more about the additional subscription details found on the **Types, Categories, Areas, Sources** and **Attributes** tabs, please refer to **Chapter 2,** or consult the Alarm OPC Server's documentation.

A.9 Troubleshooting Pager Configurations

If you have any questions about the configuration of the Multimedia software, other than the OPC Alarm and Event subscription to third-party alarm servers themselves, please contact the Smar support center. In general, all questions related to the Smar AlarmWorX Multimedia software will probably fall into this category.

You may run into the scenario that Alarms do not appear to be triggering the multimedia notifications you have configured in the Multimedia Configurator.

If you have made sure the Multimedia Server is indeed running, and that the configuration you are using is the active database, then follow these simple steps to determine whether to contact a third-party vendor or Smar:

1. Take the OPC alarm subscription(s), and any alarm filters, defined in the Multimedia software and use those exact same configurations in the SMAR AlarmWorX Viewer ActiveX window.

2. If the SMAR AlarmWorX Viewer ActiveX window is successfully showing your alarm conditions, the problem probably lies within the configuration of the Multimedia software, and so you should contact the SMAR technical support center. But before you do, please work through the flow chart troubleshooting guide shown in **Figure A.48.**

3. If the SMAR AlarmWorX Viewer ActiveX window does NOT successfully show your alarms coming in, the problem is with the subscription itself, or possibly the OPC server and/or the hardware generating the alarms. If that is the case, Smar technical support cannot be of assistance, and you must first get this running with the help of your vendor's OPC Alarm and Event server technical support.

A.9.1 Troubleshooting Flow Chart

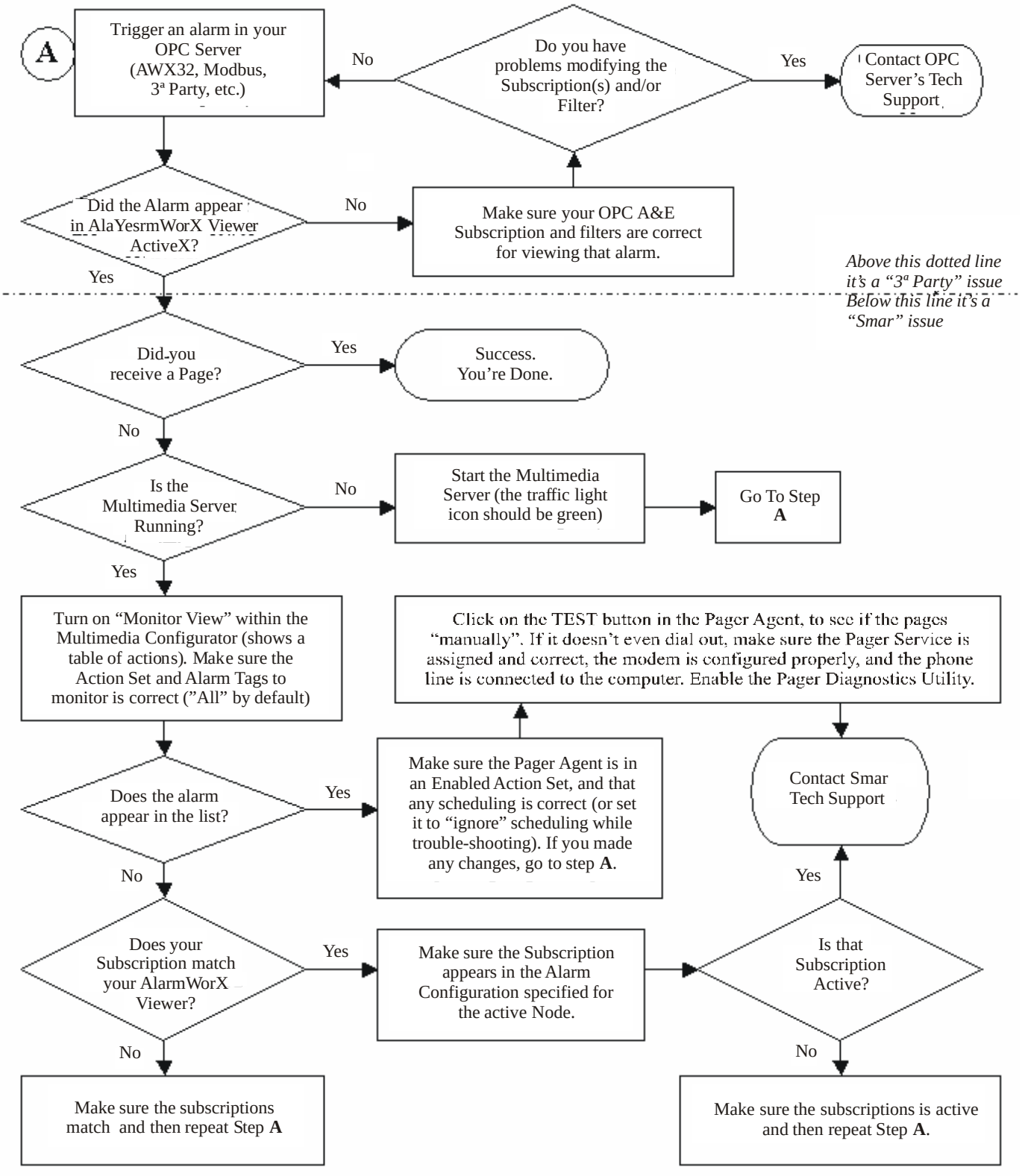


Figure A.48. Troubleshooting Flowchart

Appendix B

Advanced Telephony Settings

B.1 Overview of Phone Agents Configuration

To set the default settings for the **Phone Agents,** click on the **Phone** folder in the Multimedia Configurator, as shown in **Figure B.1.** If you do not see the **General Settings,** make sure that **Dialog View** is checked on the **View** menu. Please refer to **Chapter 4** and **Chapter 9** for information about general settings for the Phone Agents.

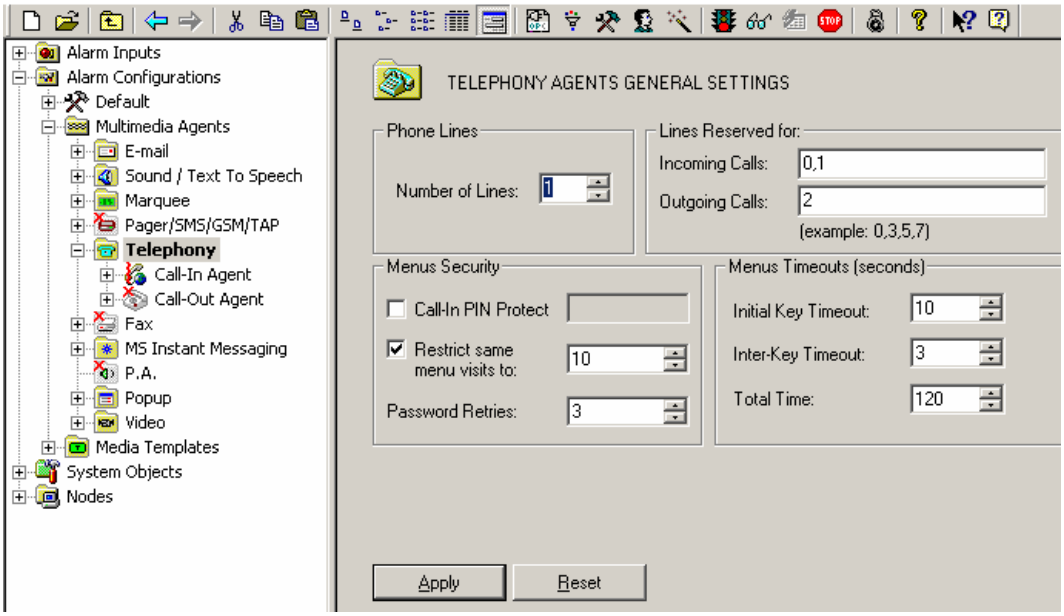


Figure B.1. Telephony Agents: General Settings

Dialogic Configuration

You must have a telephony card installed on the computer on which you are running the Phone Agents (both Call-in and Call-out). AlarmWorX Multimedia supports Intel® Dialogic® boards. **Dialogic boards do not work for Windows 98, so neither the Call-in Agent nor the Call-out Agent will work on Windows 98.** You also need to have an analog phone line connected to the board. (**Note:** Digital lines are not supported.) Only Dialogic boards are supported for the current version of AlarmWorX Multimedia. Please see **Appendix B** for information about installing and configuring Intel Dialogic boards. For more information about purchasing and installing Intel Dialogic boards, please visit the Intel Web site at www.intel.com/network/csp/products/index_vp.htm.

B.2 Creating Call-out Templates

The Multimedia Configurator provides a default media template for the Call-out Agent. To view this template, select **Alarm Configurations - Media Templates - Default Telephone** from the tree control. The telephone template field will be displayed in the right pane, as shown in **Figure B.2.**

You can create a new template for the Call-out Agent by right-clicking the **Media Templates** folder in the tree control and selecting **New - Media Template** from the pop-up menu. Select the **Phone** radio button in the template configuration field in the right pane, as shown in Figure B.2.

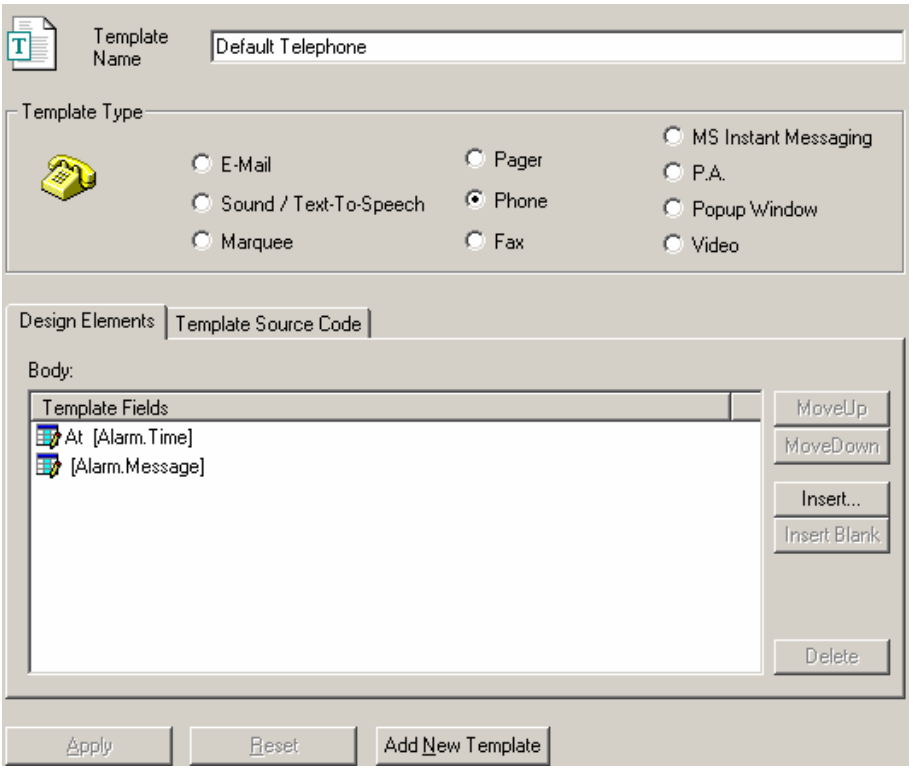


Figure B.2. Default Template for Call-out Agent

In the **Design Elements** tab of the template configuration dialog box, shown in Figure B.2, click the **Insert** button. This opens the **Template Definition Wizard** dialog box, shown in **Figure B.3,** which contains a list of available field types to add. (For a complete list of available field types, please refer to **Chapter 5.**) Choose a field type and select from the additional options under **Field Properties,** and then click **Insert.** If you wish to change the order of the fields or to delete a field, use the appropriate buttons to do so. The **Insert Blank** button will insert a line break.

Two field types—**Sound File** and **Delay**—are used specifically for the Phone Agent templates. (These field types may also be used for video and/or sound / text-to-speech templates.) The **Sound File** field type allows you to select or add a sound file to the phone template.

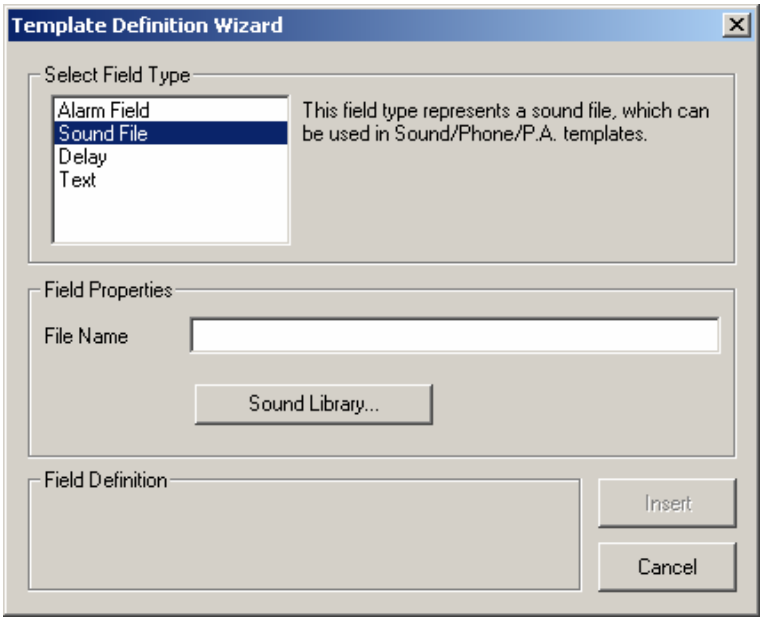


Figure B.3. Template Definition Wizard: Sound File

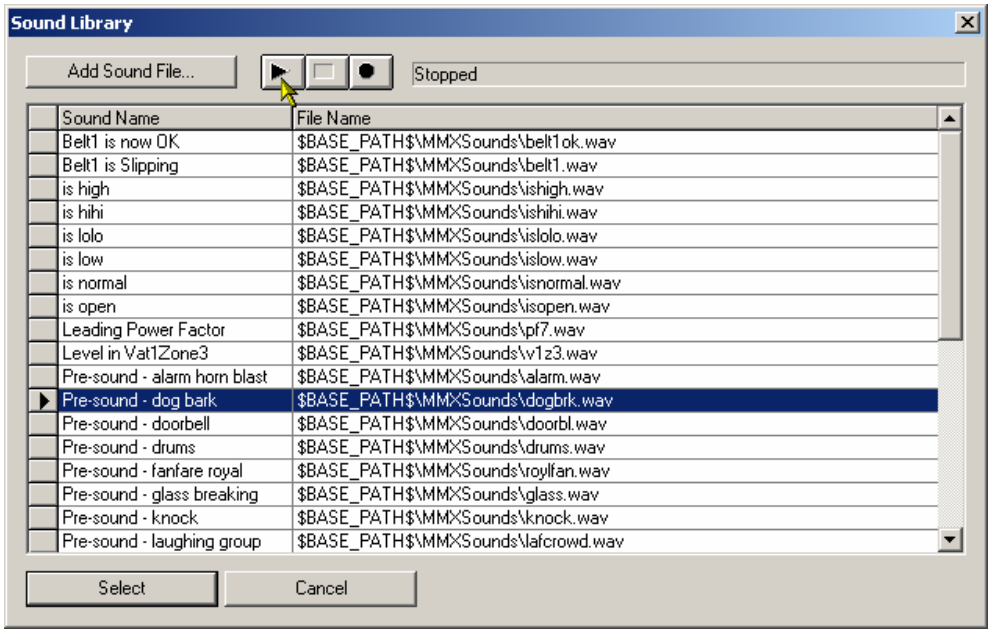


Figure B.4. Sound Library Dialog Box

Clicking on the **Sound Library** button opens the **Sound Library** dialog box, shown in **Figure B.4.** Click the **Add Sound File** button to browse for .wav and .mid files. Click **Open** to add the selected file to the Sound Library. To listen to a file, highlight the file and click the **Play** button, as shown in Figure B.4. To select an existing sound file from the Sound Library, highlight the entire row for that file, and then click the **Select** button. The selected sound file will appear under **Field Definition** in the **Template Definition Wizard** dialog box.

You can also set a delay for the templates by selecting the **Delay** field type in the **Template Definition Wizard** dialog box, as shown in **Figure B.5.** Under **Field Properties,** you can enter the delay time (in milliseconds) before the next template can be activated. Click the **Insert** button to add the delay to the list of template fields.

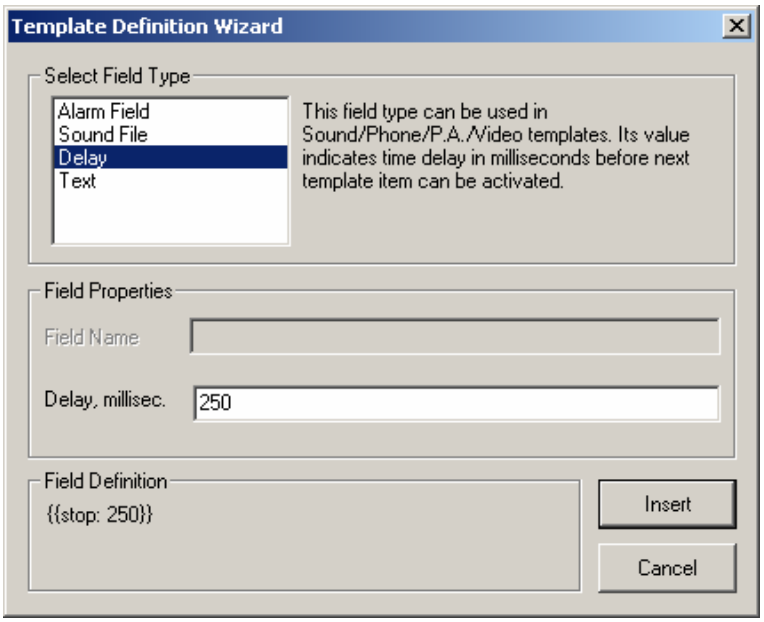


Figure B.5. Template Definition Wizard: Delay

All current template fields are displayed the **Design Elements** tab (see Figure B.3). The **Field Definition** for these template fields is also displayed in the **Template Source Code** tab, shown in **Figure B.6,** where you can manually edit a template field if desired.

Note: The **Template Source Code** tab is recommended for advanced users only. Do not modify any fields here unless you are absolutely sure of what you are doing. For more information about templates, please refer to **Chapter 5.**

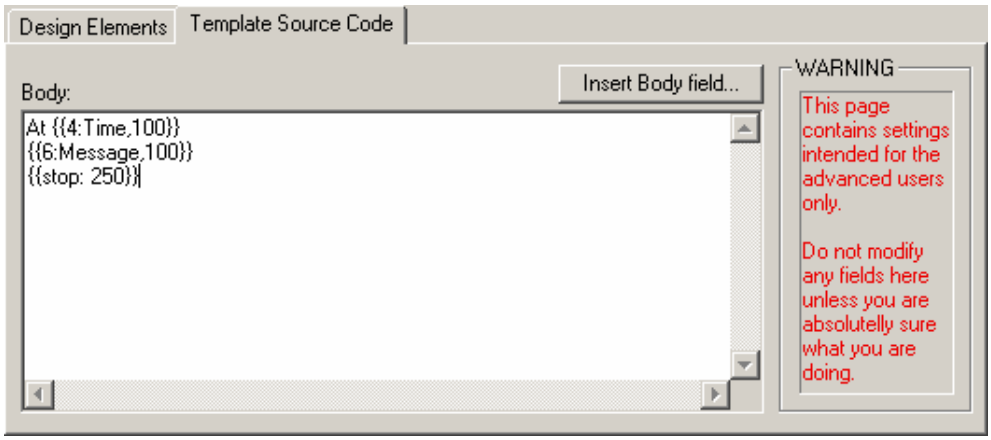


Figure B.6. Template Source Code Tab

To save the changes to your template, click the **Apply** button in the phone template configuration field. Now you can go to the Phone Agent configuration field under the **Multimedia Agents - Phone** folder in the tree control of the Configurator and select your template from the **Use Template** drop-down list, as shown in **Figure B.7.** Be sure to click the **Test** button to test your configuration.

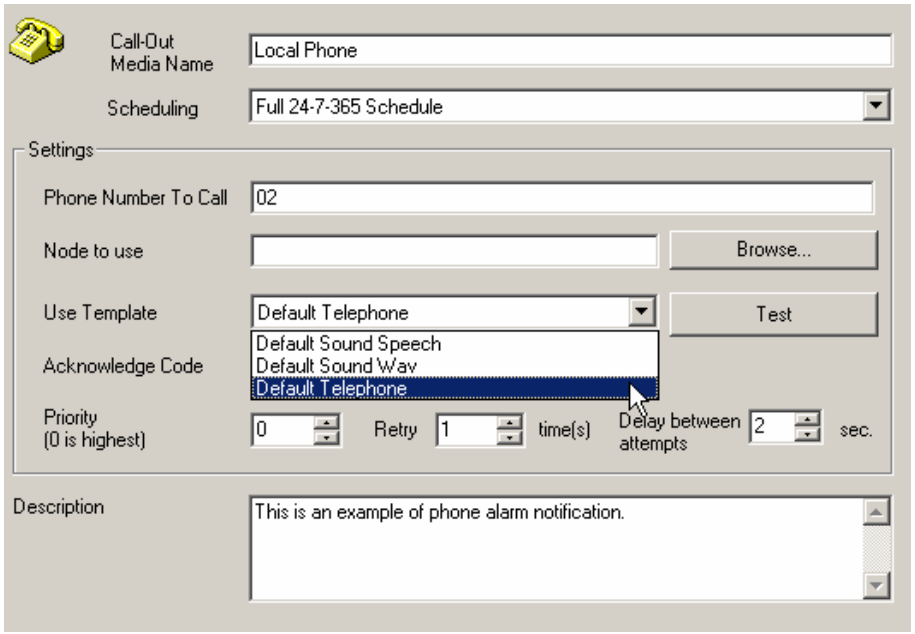


Figure B.7. Selecting the Template in the Telephony Agent Configuration

B.3 Intel Dialogic Boards

Generally, any Intel Dialogic telephony card will work with the Phone Agent. It requires the proper installation of Intel Dialogic System Release Version 5.1 software as well as proper card installation and configuration. The Phone Agent uses Topaz tools for working with Intel Dialogic System Release Version 5.1 software. Topaz components are embedded in the Phone Agent. The following Intel Dialogic telephony cards have been tested:

- D/4PCI (supports up to four phone lines)
- Dialog/4 ISA (supports up to two phone lines)
- ProLine/2V (supports up to two phone lines)

Note: For more information about purchasing and installing Intel Dialogic boards, please visit the Intel Web site at www.intel.com/network/csp/products/index_vp.htm.

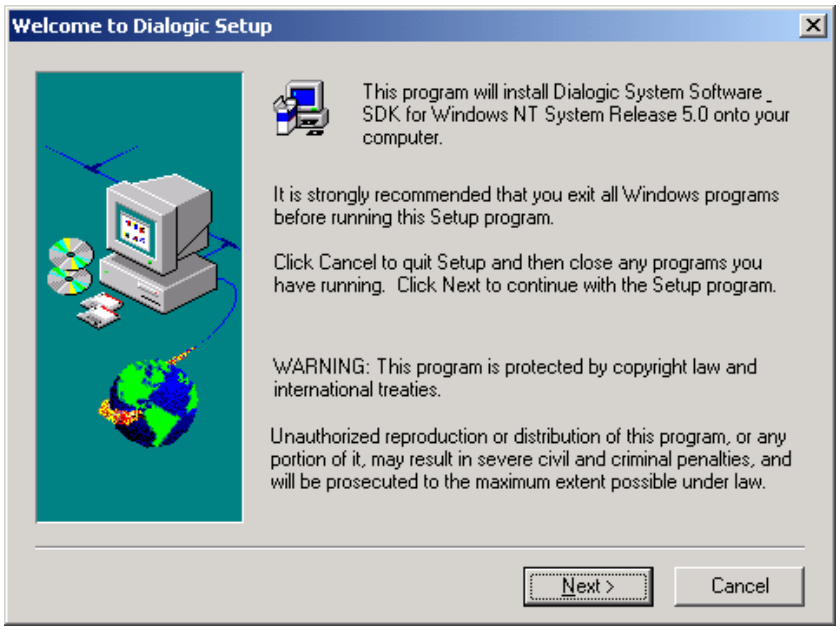


Figure B.8. Welcome to Dialogic Setup Installation Screen

B.3.1 Installing Intel Dialogic Boards

This section describes the procedure for installing Intel Dialogic System Release Version 5.1 software.

Note: Please refer to the Intel Dialogic help documentation for more information.

1. Insert the Intel Dialogic System Release Version 5.1 CD.
2. The **Welcome to Dialogic Setup** dialog box will appear, as shown in **Figure B.8.** Click the **Next** button to continue.
3. The **Registration** dialog box will appear. Enter your name and your company's name. Click the **Next** button to continue.
4. The **Setup Options** dialog box will appear. Select the **Typical** setup. Click the **Next** button to continue.
5. The **Destination Location** dialog box will appear, as shown in **Figure B.9.** Click the **Browse** button to select a directory for installation. Click **Next.**

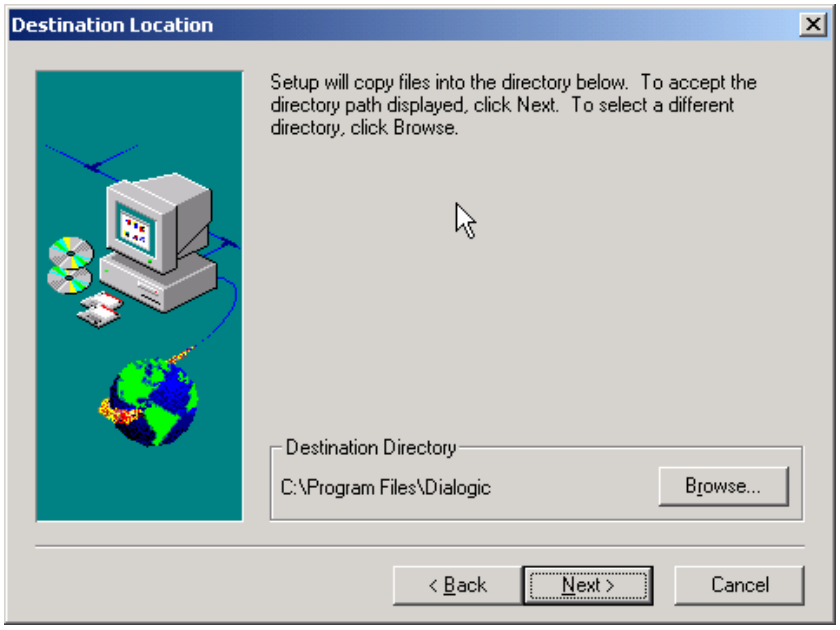


Figure B.9. Choosing a Location for the Installed Files

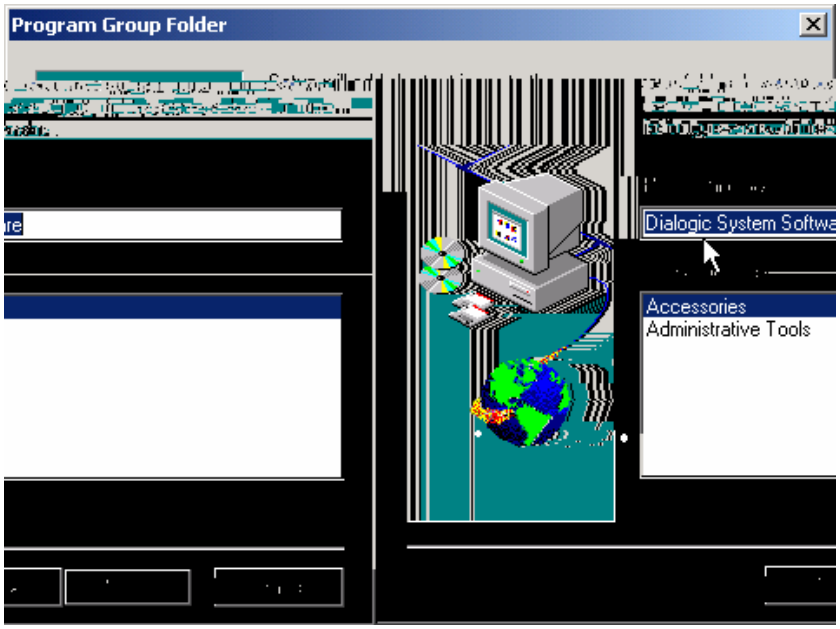


Figure B.10. Specifying the Program Group Folder

6. The **Program Group Folder** dialog box will appear, as shown in **Figure B.10.** Specify a program folder, and then click the **Next** button to continue.
7. The **Selecting Options Summary** dialog box will appear, listing the settings that you have chosen. To accept the settings, click the **Next** button.
8. The installation will now copy files to your system.
9. The **Selection** dialog box will appear, as shown in **Figure B.11.** Check the **View Release Guide** check box, and then click the **Next** button to complete installation.
10. The **Setup Complete** dialog box will appear. It is recommended that you restart your computer. Click the **Finish** button to complete the installation. Now you are ready to install and configure a telephony card.

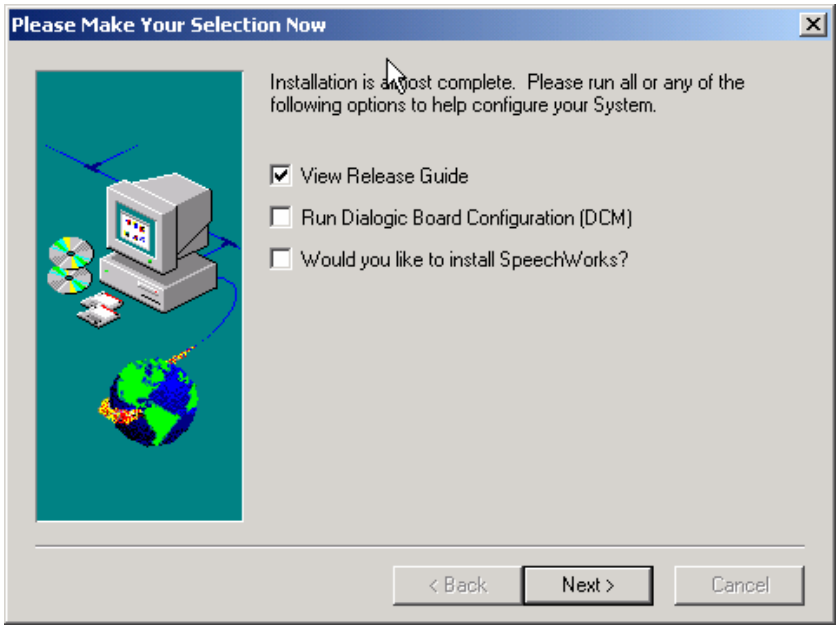


Figure B.11. Selection Dialog Box

B.4 Installing and Configuring Telephony Cards

This section covers the procedure for installing and configuring the Dialogic Proline/2V telephony card. (You can use other telephony cards if desired.) The following steps must be followed to ensure proper card installation and configuration. Click on the **Help** menu at any time to view the Dialogic help documentation.

1. Install the Intel Dialogic Proline/2V card as it described in the manual, which can be found inside the card package.
2. Start the **Dialogic Configuration Manager,** as shown in **Figure B.12.**

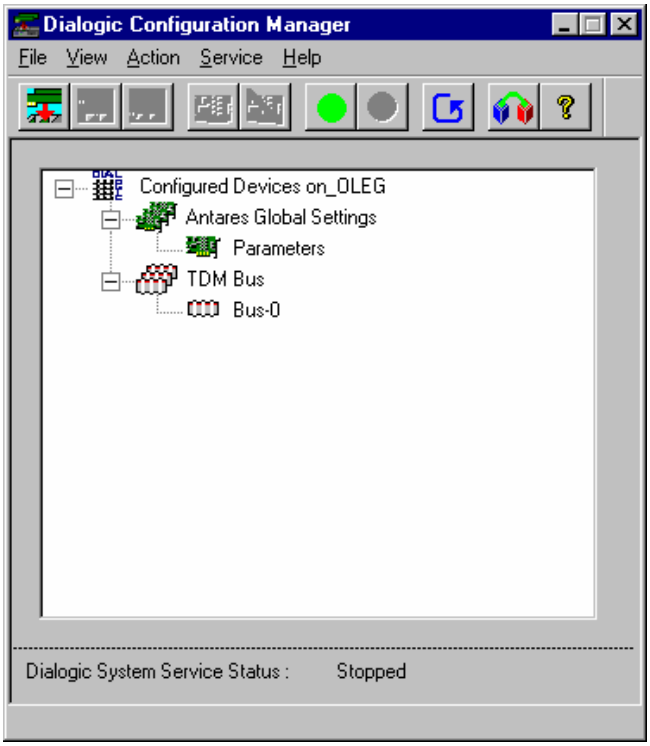


Figure B.12. Dialogic Configuration Manager

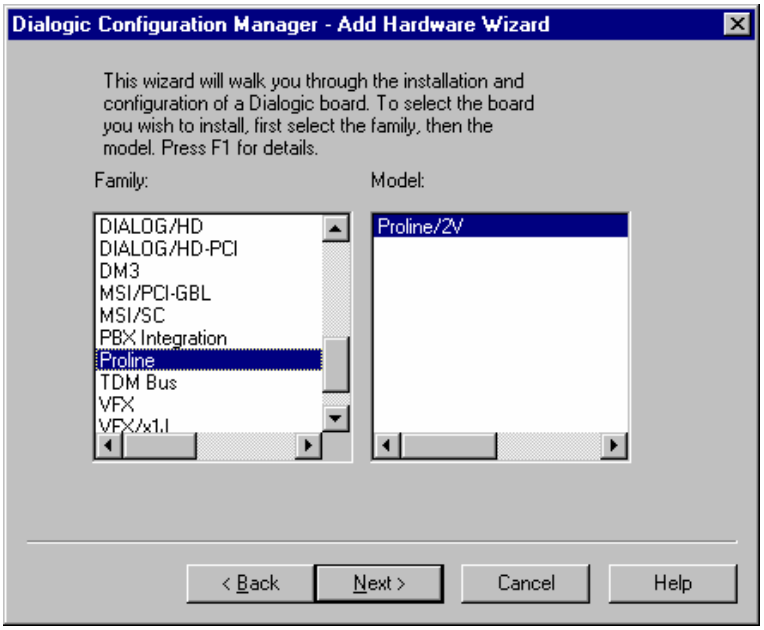


Figure B.13. Add Hardware Wizard: Choosing the Telephony Card

3. Select **Add Device** from the **Action** menu. This opens the **Add Hardware Wizard** dialog box, as shown in **Figure B.13.** Scroll down the list of cards under **Family** and select **Proline.** Then, under **Model,** select **Proline/2V.** Click the **Next** button to continue.
4. Enter a unique name for the board, as shown in **Figure B.14.** Click the **Next** button to continue.

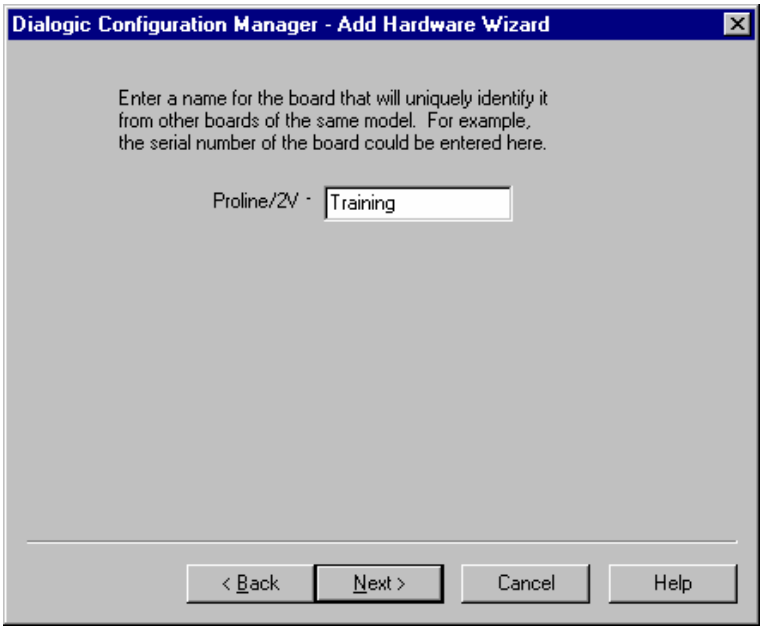


Figure B.14. Add Hardware Wizard: Naming the Board

5. This opens the **Properties** dialog box for the telephony card, as shown in **Figure B.15.** On the **System** tab, select the correct memory address from the **Parameter** field. In this case it is "d2000", as shown in Figure B.15. Also choose the same interrupt number that was chosen during the actual card installation.

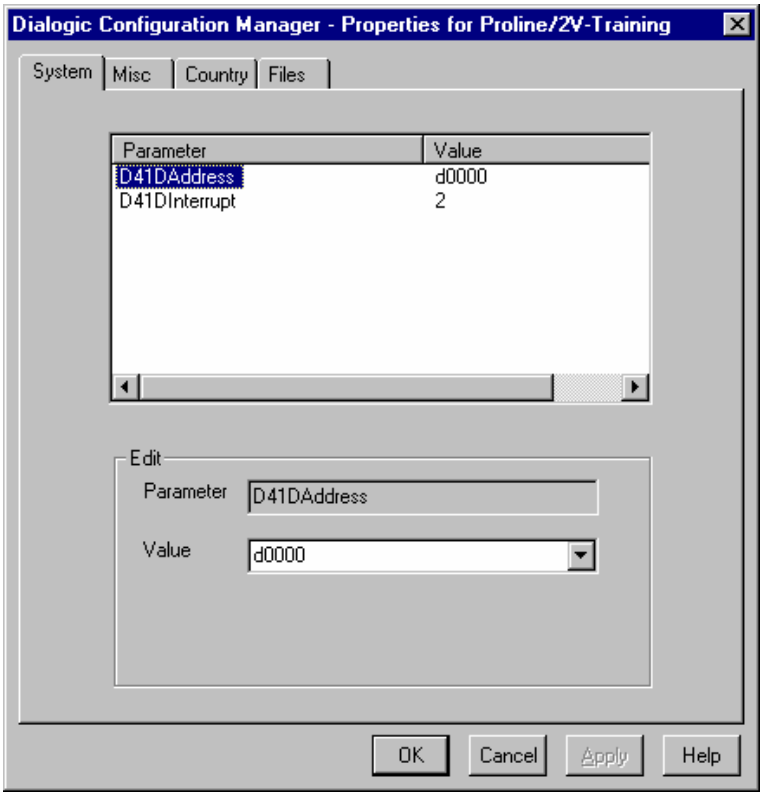


Figure B.15. Dialogic System Properties

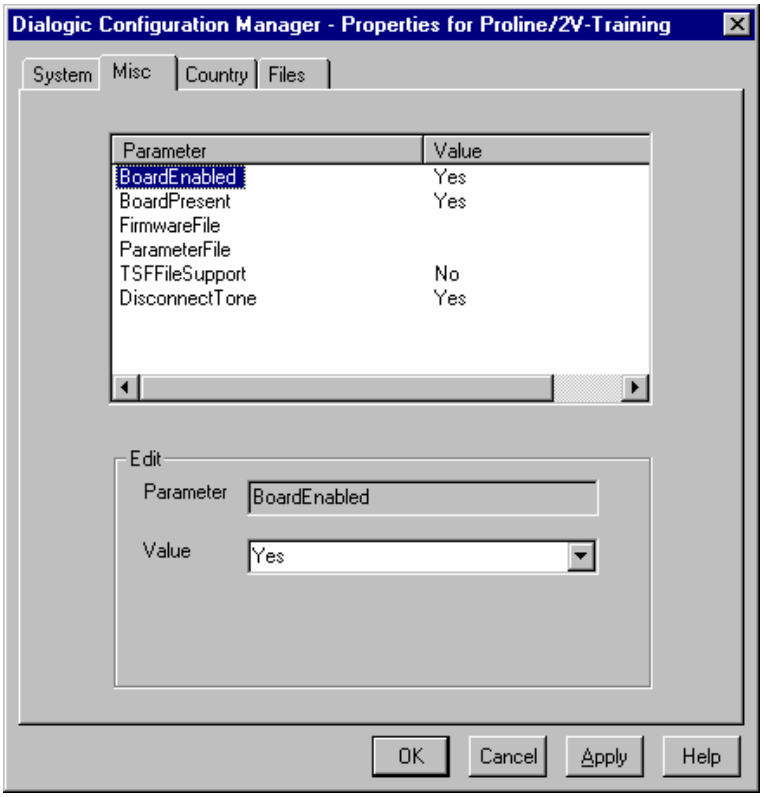


Figure B.16. Dialogic Miscellaneous Properties

6. Click on the **Misc** tab on the **Properties** dialog box, as shown in **Figure B.16.** Verify that the configured parameters are correct. Then click **Apply** and **OK.**
7. **Figure B.17** shows how a properly configured Proline/2V card looks. Now you are ready to start the service.

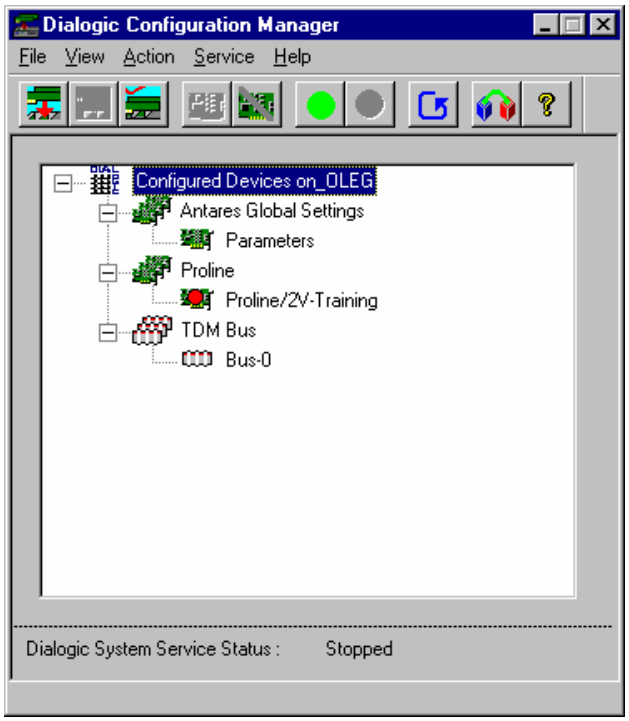


Figure B.17. Completed Card Configuration

8. To start the service, click the **Start Service** (green circle) button on the **Diagnostic Configuration Manager** toolbar. This will start the Proline/2V telephony card, as shown in **Figure B.18.** The Status box will indicate whether the telephony card started successfully. Now you are ready to start using the Phone Agent.

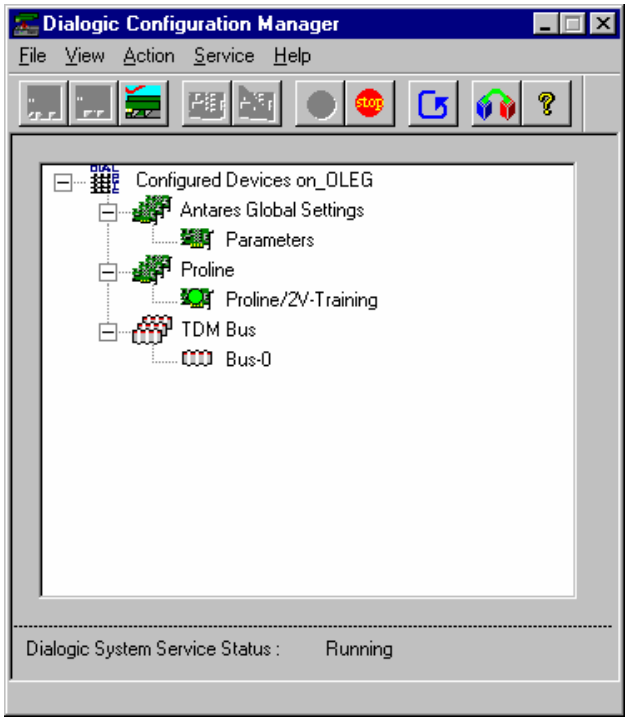


Figure B.18. Activated Telephony Card

B.5 Using the Dialogic Diagnostic Utility

The **Universal Dialogic Diagnostic Utility** (UDDU) provides diagnosis of telephony card failure or other problems.

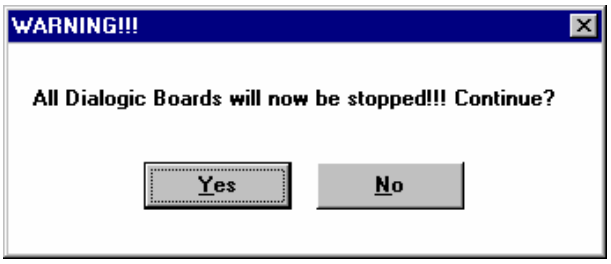


Figure B.19. Universal Dialogic Diagnostic Utility Warning

1. Go to "Program Files/Dialogic System Software/Universal Dialogic Diagnostics Utility" to start the UDDU. A message box will appear warning you that the UDDU is about to stop all configured and running Dialogic boards, as shown in **Figure B.19.** Click **Yes** to stop the Dialogic boards, in order for the UDDU to work properly. This opens the **Universal Dialogic Diagnostics** screen, shown in **Figure B.20.**

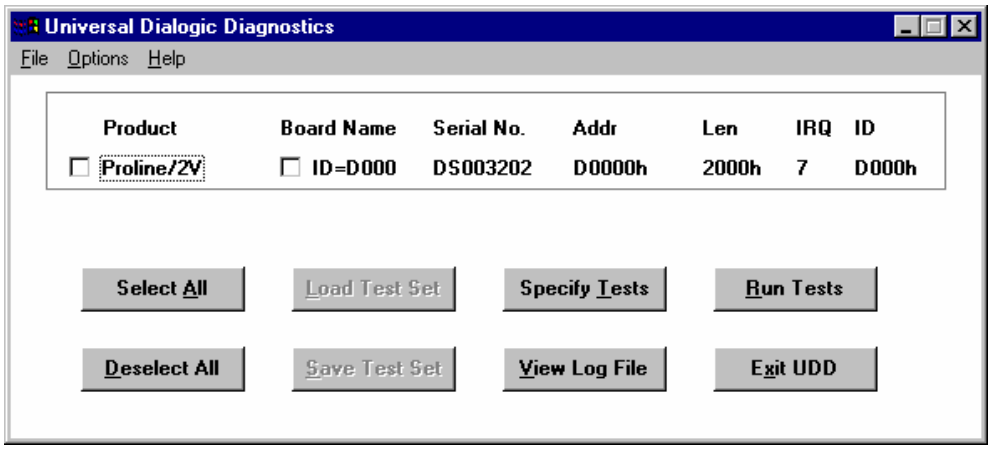


Figure B.20. Universal Dialogic Diagnostics Utility Screen

2. Check the **Proline/2V** check box, as shown in Figure B.20, and then click the **Specify Tests** button.
3. This opens the **Specify Tests** dialog box, shown in **Figure B.21.** Choose the appropriate tests from the list, and then click **OK.**
4. Click **Run Tests,** and then analyze the results. If you need any help, refer to the Dialogic help documentation.

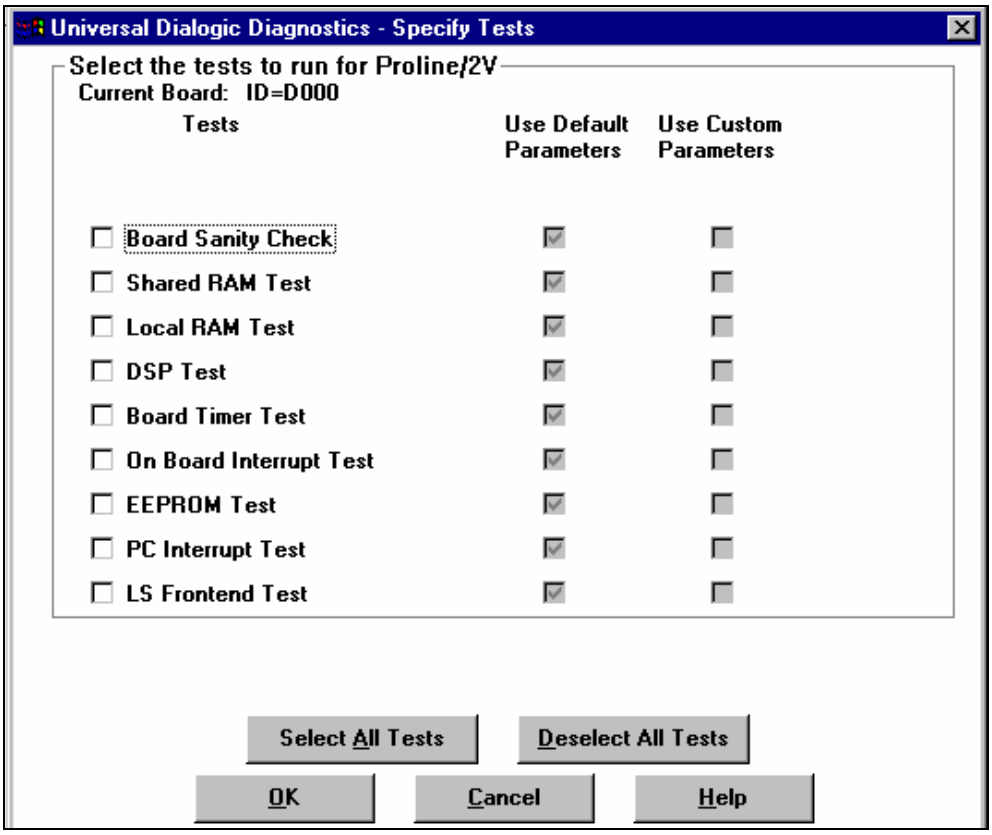


Figure B.21. Specifying Diagnostics Tests for the Card

Note: It is a good idea to test the Dialogic card has been installed and configured. Dialogic provides several sample applications that can be used for this purpose. The Voice Horoscope program is a good starting application. To launch it, select **Start > Programs > Dialogic System Software > Dialogic Sample Programs > Voice Horoscope.** Once the program is launched, select **Channels > Open.** The program is now ready to receive phone calls. If the Dialogic card is correctly installed, you should hear a response to a call.

Appendix C

Advanced Video Settings

C.1 Configuring a Video Capture Device

The Multimedia Video Agent allows you to send a video or a video snapshot to a computer providing alarm information. The general settings for video agents may vary depending on which device is used. General settings will only function if you have a video capture device (Web camera) installed on your computer. If no video capture device is found, you will get an error message informing you that the application could not find any video capture devices.

If you are using a remote node for video capture, you will have to go to the remote node and change the settings for video capture on that node. If there is no Multimedia Configurator installed on your video capture node, then you can run the "bin/'MMXSnapshot.exe" to set the general settings.

Although many different kinds of video capture devices can be used with the Video Agent, we will use the Logitech® QuickCam® video camera here as an example configuration. This example assumes that the Logitech QuickCam software has already been installed on the system. Once the video capture device is installed, go to the **Alarm Configurations - Multimedia Agents - Video** folder on the tree control of the Multimedia Configurator. Click on the **General Settings** button, as shown in **Figure C.1.** If you do not see the **General Settings** button, make sure that **Dialog View** is checked on the **View** menu.

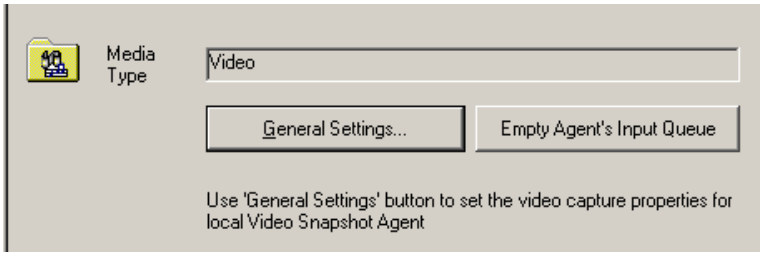


Figure C.1. Video Agent: General Settings

C.1.1 SnapShot Configuration

Clicking **General Settings** opens the **Snapshot Configuration** dialog box, shown in **Figure C.2.** The **Snapshot Configuration** dialog box contains the following options.

Display

Clicking the **Display** button in the **Snapshot Configuration** dialog box allows you to choose display properties for the video capture device. In this case, the display properties are not supported by Logitech QuickCam, so a message appears as shown in **Figure C.3.**

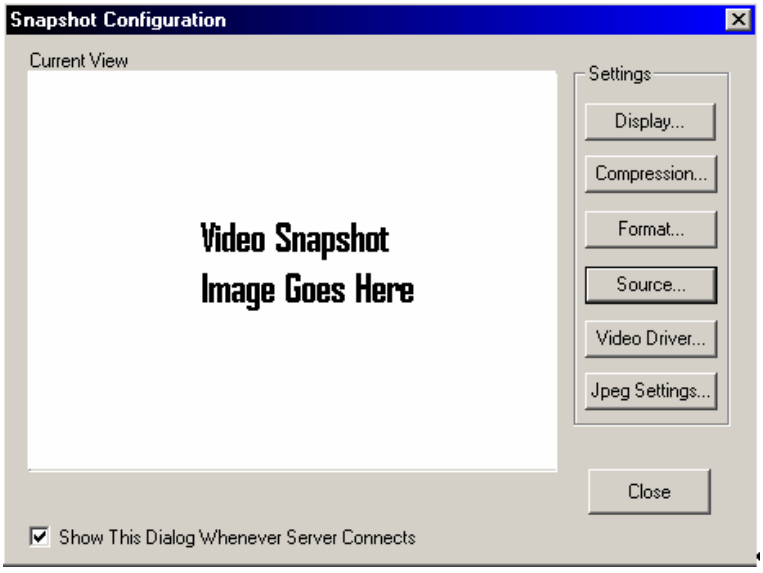


Figure C.2. Snapshot Configuration Dialog Box

Figure C.3. Display Properties Not Supported

Compression

Clicking the **Compression** button in the **Snapshot Configuration** dialog box allows you to choose a component to use if you wish to compress the video files, as shown in the **Video Compression** dialog box in **Figure C.4.**

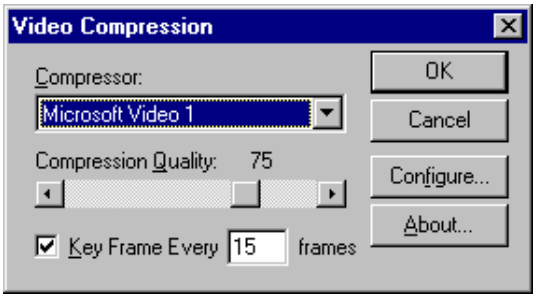


Figure C.4. Video Compression Setup

Format

Clicking the **Format** button in the **Snapshot Configuration** dialog box allows you to set options such as color, mirror, flip, and size, as shown in **Figure C.5.** Choose the desired settings, and then click **OK.**

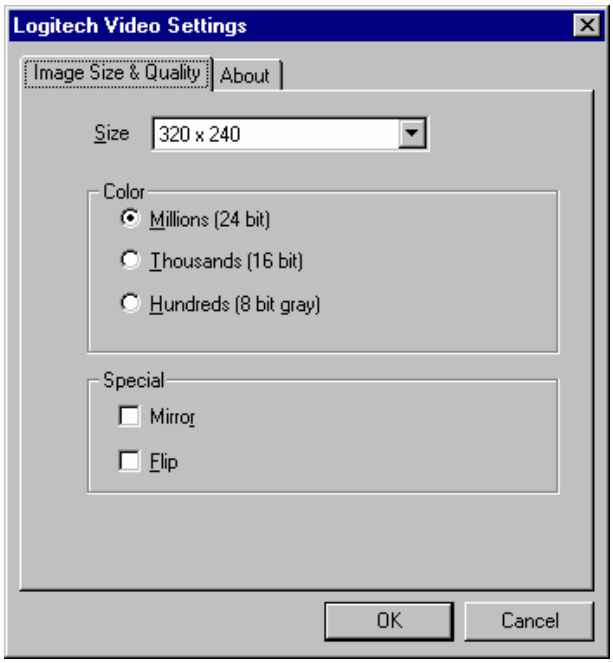


Figure C.5. Video Settings: Format

Source

Clicking the **Source** button in the **Snapshot Configuration** dialog box allows you to configure hardware settings based on the video driver you choose to use. As shown **in Figure C.6,** you can specify the brightness, hue, quality, exposure time, and light sensitivity.

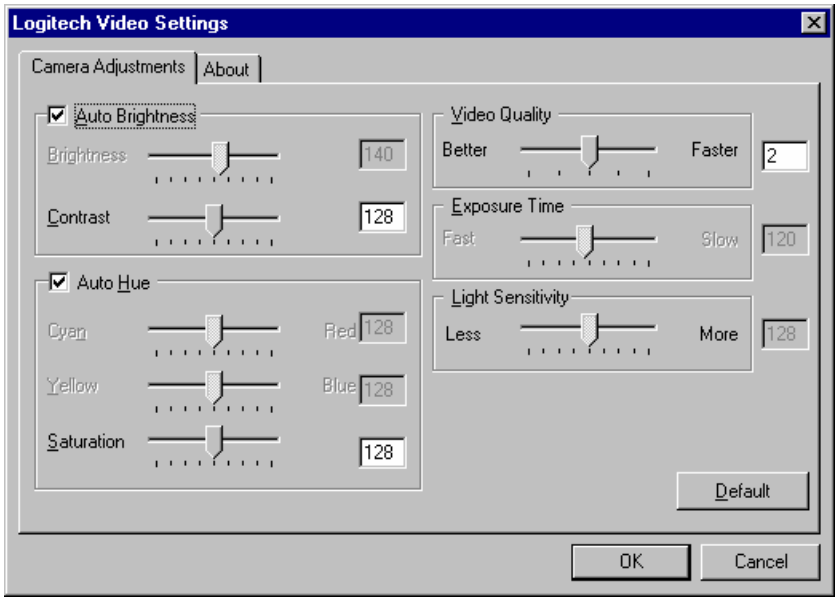


Figure C.6. Video Settings: Source

Video Driver

Clicking the **Video Driver** button in the **Snapshot Configuration** dialog box opens the **Video Capture Selection** dialog box, shown in **Figure C.7.** Select the video capture driver from the drop-down list.

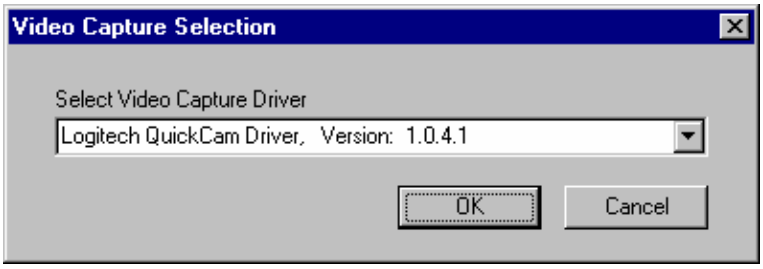


Figure C.7. Video Capture Driver Selection

JPEG Settings

Clicking the **Jpeg Settings** button in the **Snapshot Configuration** dialog box allows you to select the quality level and the option to display in color or grayscale for snapshots, as shown in **Figure C.8.**

Note: For details about Video Agent configuration fields, refer to **Chapter 4.**

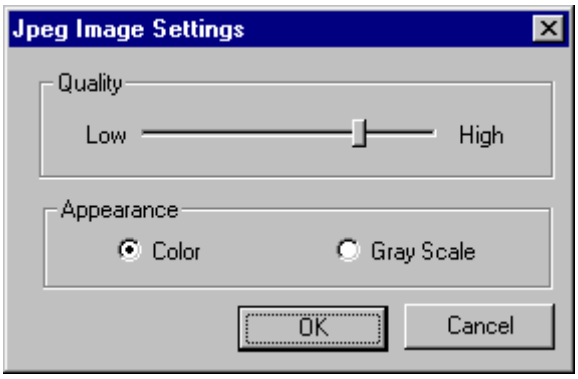


Figure C.8. Jpeg Image Settings for Video Camera

C.2 Creating Video Templates

The Multimedia Configurator provides a default template for the Video Agent. To view this template, select **Alarm Configurations - Media Templates - Default Video** from the tree control. The video template field will be displayed in the right pane, as shown in **Figure C.9.**

You can create a new template for the Video Agent by right-clicking the **Media Templates** folder in the tree control and selecting **New - Media Template** from the pop-up menu. Select the **Video** radio button in the template configuration field in the right pane, as shown in Figure C.9.

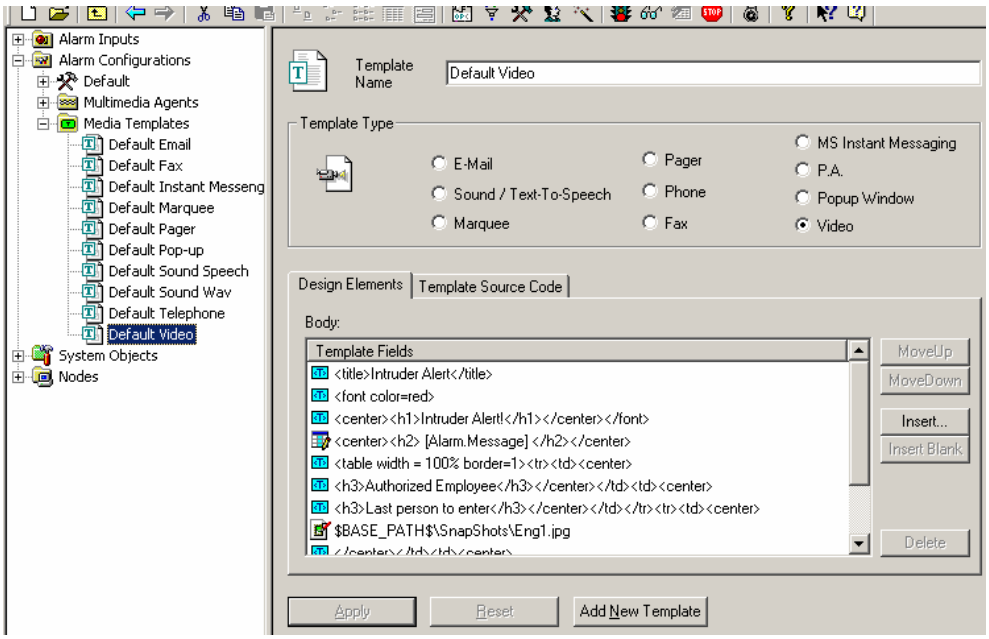


Figure C.9. Default Template for Video Agent

In the **Design Elements** tab of the template configuration dialog box, shown in Figure C.9, click the **Insert** button. This opens the **Template Definition Wizard** dialog box, shown in **Figure C.10,** which contains a list of available field types to add. (For a complete list of available field types, please refer to **Chapter 5.**) Choose a field type and select from the additional options under **Field Properties,** and then click **Insert.** If you wish to change the order of the fields or to delete a field, use the appropriate buttons to do so. The **Insert Blank** button will insert a line break.

Three field types—**SnapShot Capture, Picture File,** and **Video File**—are used specifically for the Video Agent templates. (**Picture File** and **Video File** field types may also be used for popup templates.)

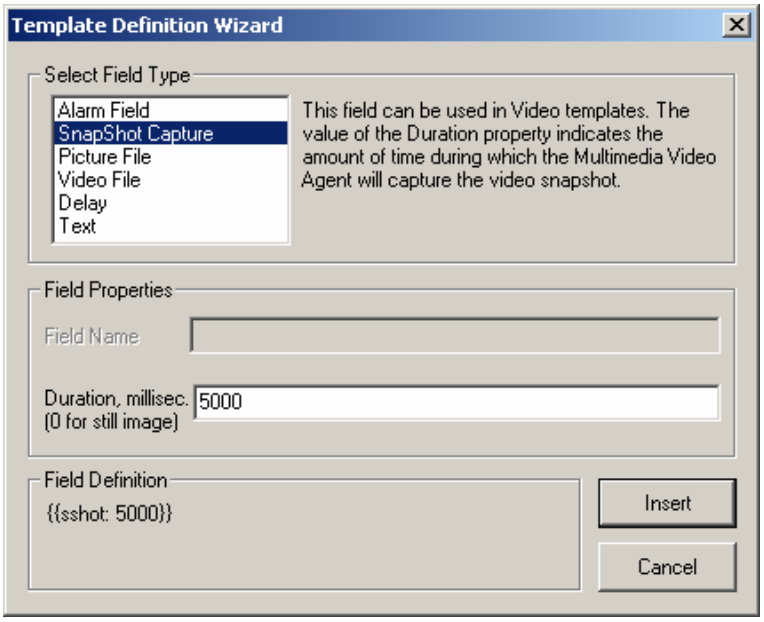


Figure C.10. Template Definition Wizard: SnapShot Capture Field

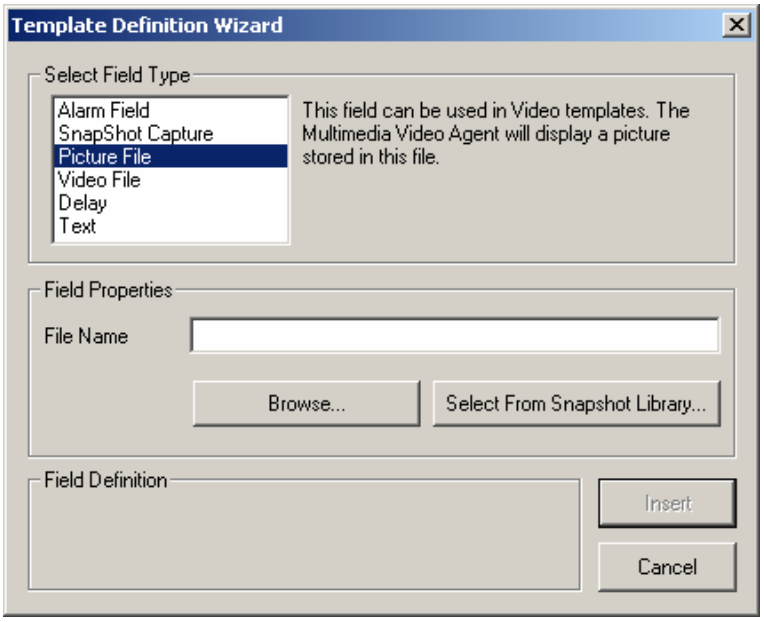


Figure C.11. Template Definition Wizard: Picture File Field

SnapShot Capture

In the **SnapShot Capture** field type in the **Template Definition Wizard** dialog box, you can set the amount of time (in milliseconds) during which the Video Agent will capture the video snapshot, as shown in **Figure C.10.**

Picture Files

In the **Picture File** field type in the **Template Definition Wizard** dialog box, shown in **Figure C.11,** you can choose a picture file (.jpg, .jpeg, .gif) for the Video Agent to display. Click the **Browse** button to select a file. You can also click the **Select From Snapshot Library** button to choose from a list of existing picture files.

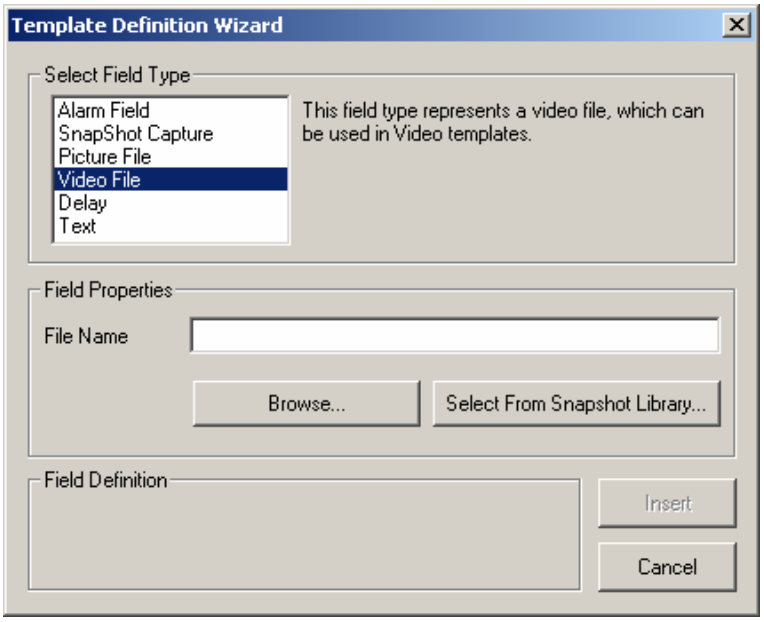


Figure C.12. Template Definition Wizard: Video File Field

Video Files

The **Video File** field type in the **Template Definition Wizard** dialog box, shown in **Figure C.12,** is similar to the **Picture File** field. You can choose a video file (.avi, .mpg, .mpeg, .mov) for the Video Agent to display. Click the **Browse** button to select a file. You can also click the **Select From Snapshot Library** button to choose from a list of existing video files.

This opens the **Snapshot Library,** shown in **Figure C.13.** To view an image in the Snapshot Library, highlight the row of that image, and then click the **Play/Show** button. You can also add existing images to the Snapshot Library by clicking the **Add Snapshot** button. This allows you to browse for an image to add. Select the image file, and then click **Open.**

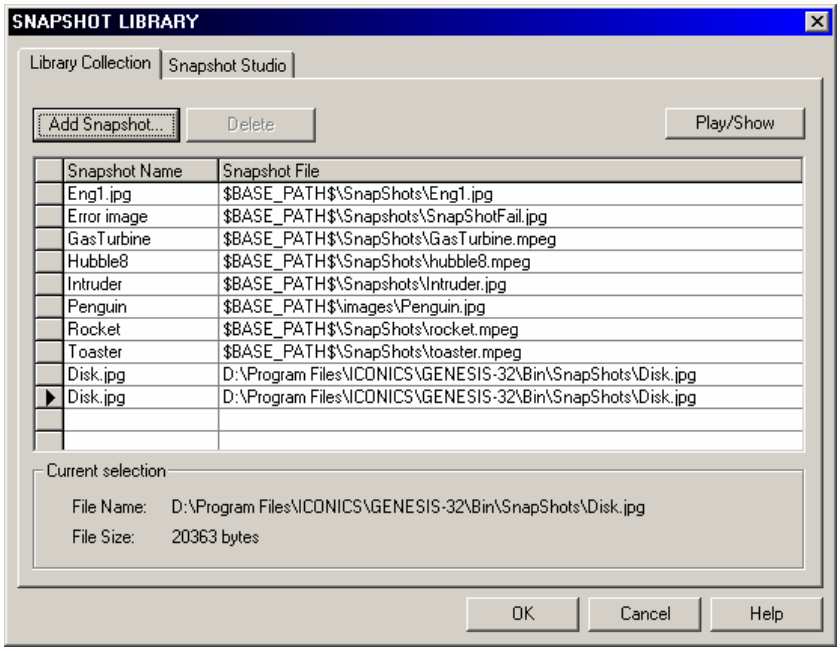


Figure C.13. Snapshot Library: Library Collection

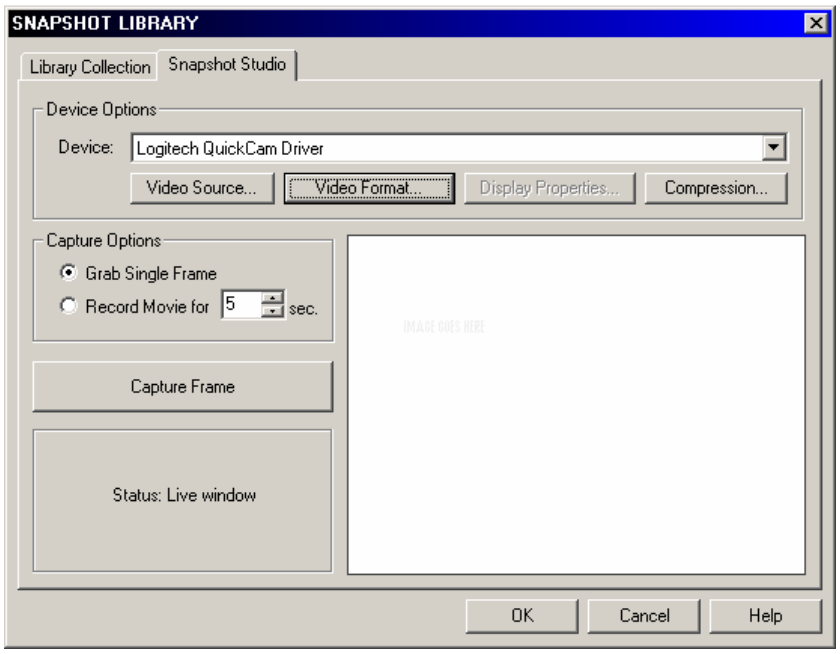


Figure C.14. Snapshot Library: SnapShot Studio

To add a brand new image to the Snapshot Library, click on the **Snapshot Studio** tab, as shown in **Figure C.14.** Select the appropriate video capture device from the **Device Options** field. You may also adjust the **Video Source, Video Format**, or **Compression** (as described above). The **Capture Options** field allows you to capture a single picture frame or to record a movie for a specified duration (in seconds).

After all settings are configured, click the **Capture Frame** button. This captures the image shown in the window to the right. Save the captured picture or movie in .jpg or .avi format, respectively. Then you can add this snapshot to the library and use it later for video template modifications.

Delay

You can also set a delay for the templates by selecting the **Delay** field type in the **Template Definition Wizard** dialog box, as shown in **Figure C.15.** Under **Field Properties,** you can enter the delay time (in milliseconds) before the next template can be activated. Click the **Insert** button to add the delay to the list of template fields.

All current template fields are displayed in the **Design Elements** tab (see Figure C.9). The **Field Definition** for these template fields is also displayed in the **Template Source Code** tab, shown in **Figure C.16,** where you can manually edit a template field if desired. You can also add HTML code to the template.

Note: The **Template Source Code** tab is recommended for advanced users only. Do not modify any fields here unless you are absolutely sure of what you are doing. Refer to **Chapter 5** for information about HTML commands for video templates.

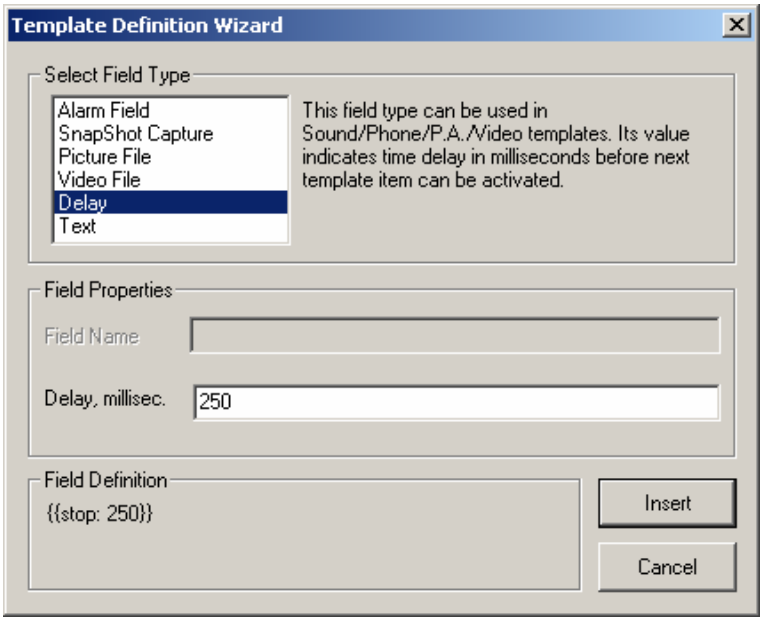


Figure C.15. Template Definition Wizard: Delay

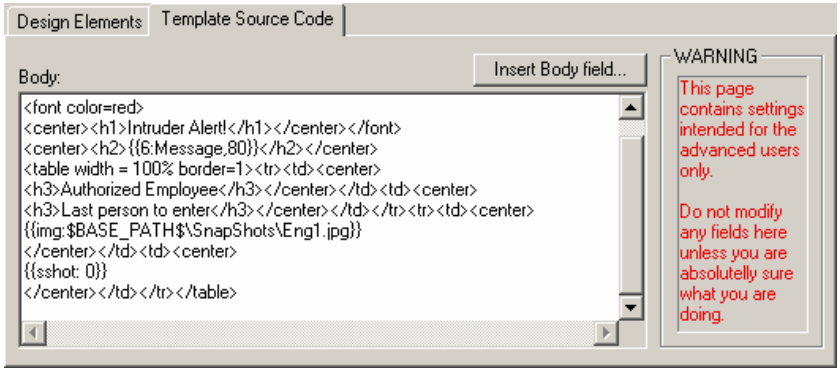


Figure C.16. Template Source Code Tab

To save the changes to your template, click the **Apply** button in the video template configuration field. Now you can go to the Video Agent configuration field under the **Multimedia Agents - Video** folder in the tree control of the Configurator and select your template from the **Use Template** drop-down list, as shown in **Figure C.17.** Be sure to click the **Test** button to test your configuration.

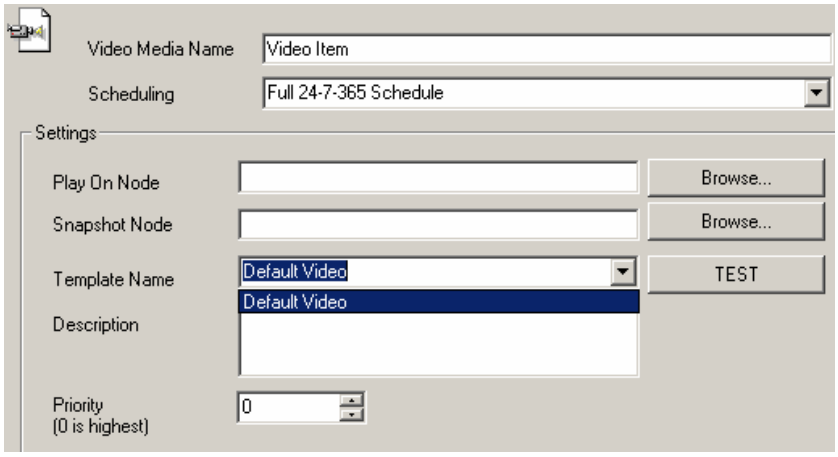


Figure C.17. Selecting the Template in the Video Agent Configuration

Appendix D

Upsizing Databases

D.1 Introduction to Database Upsizing

You can upsize your Smar AlarmWorX Multimedia databases from Microsoft Access (.mdb) to MSDE, allowing you to take advantage of the powerful relationship database technology in MSDE. MSDE supports databases up to 2 GB with up to five concurrent users. This appendix provides instructions for upsizing databases from Microsoft Access to MSDE.

Though the default Multimedia configuration database is a Microsoft Access database ("AWXMMX.mdb" file), both the Multimedia Configurator and the Multimedia Server are designed to work with SQL Server databases as well.

In some cases (heavy alarm flow, etc.) the transition to a SQL Server database is required to make use of the better memory management, database security, robustness, and higher performance of SQL Server or MSDE.

D.2 Using Universal Data Link Files

The Multimedia Configurator connects to a SQL database by using the Microsoft Universal Data Link file (.udl). Files of this type contain OLE DB connection information that allows the application to create and manage connections to OLE DB databases.

D.2.1 Creating a Universal Data Link File

To create Universal Data Link file:

1. Open Windows Explorer.
2. Select the folder in which you want to save the .udl file. Right-click in the right (results) pane, and select **New - Text Document** from the pop-up menu.
3. From the **Tools** menu, select **Folder Options.** On the **View** tab of the **Folder Options** dialog box, shown in **Figure D.1,** clear the **Hide file extensions for known file types** check box, and then click **OK.**

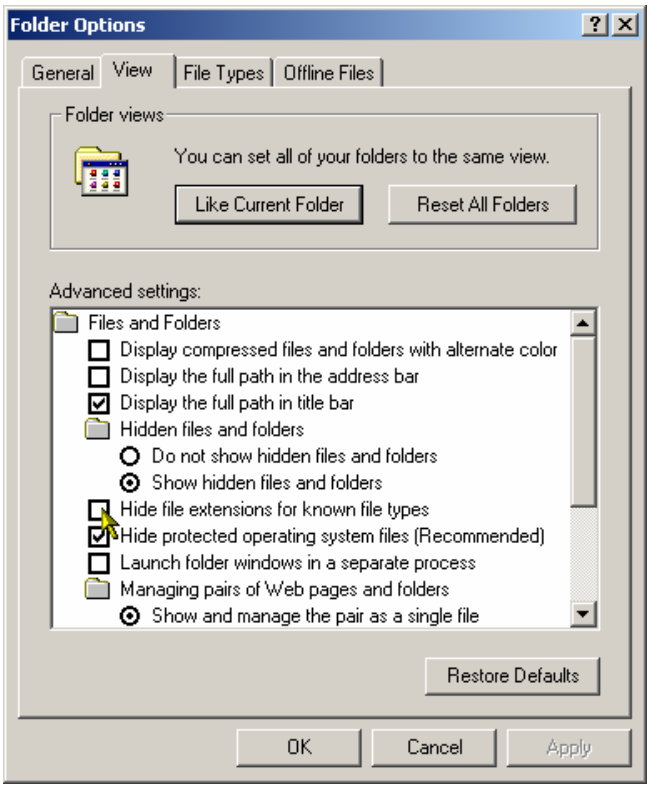


Figure D.1. Windows Explorer: Folder Options Dialog Box

4. Right-click on the text file you created in step 2 above, and then click **Rename.** Type the new file name using the .udl file extension. Press **Enter.** A warning may appear, explaining that changing file extensions may cause files to become unusable. Disregard this warning. You can store .udl files anywhere on your system or network.

5. Double click on the .udl file in Windows Explorer to display the **Data Link Properties** dialog box. On the **Provider** tab, shown in **Figure D.2,** select **Microsoft OLE DB Provider for SQL Server.**

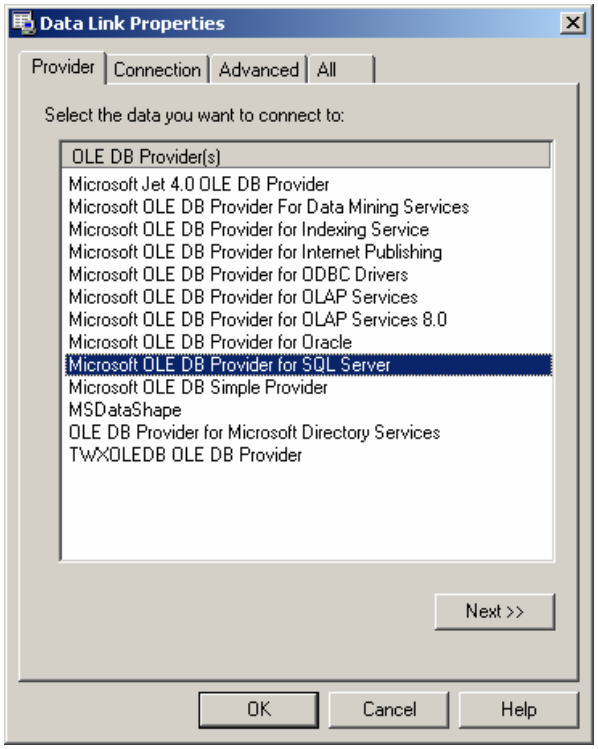


Figure D.2. Data Link Properties Dialog Box: Provider Tab

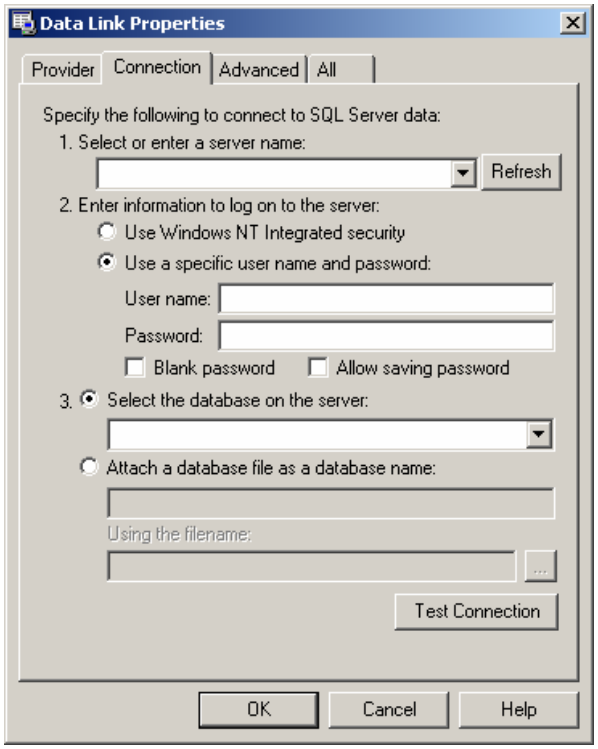


Figure D.3. Data Link Properties Dialog Box: Connection Tab

In the **Connection** tab, shown in **Figure D.3,** specify the SQL Server name, user name, password, and database name. Click **OK** to save OLE DB connection information in the .udl file.

D.3 Using the Microsoft Access Upsizing Wizard

Microsoft Access 2000 installs a powerful Upsizing Wizard that allows you to upsize any existing .mdb database to SQL Server. Use the following procedure to upsize the Multimedia configuration database using the Upsizing Wizard:

1. Run Microsoft Access 2000 and open the Multimedia configuration database file. The default database file is ProcessView\Bin\"AWXMMX.mdb".
2. From the **Tools** menu, select **Database Utilities - Upsizing Wizard,** as shown in **Figure D.4.** At this point, Access may give you the option to install the wizard. Follow the installation steps, and then run the Upsizing Wizard from the **Tools** menu.

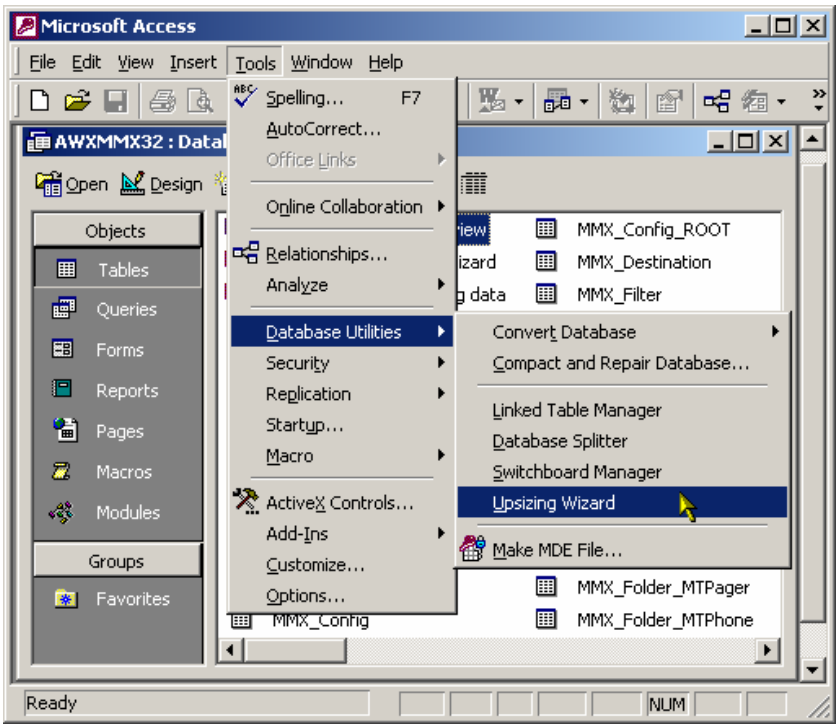


Figure D.4. "AWXMMX.mdb" Database File

3. Select the **Create New Database** option, and then click **Next.**
4. Make sure your SQL Server is up and running. Select a server name from the SQL Server drop-down list. Specify the **Login ID** and **Password** of the SQL Server database administrator. Provide a name for the new SQL Server database. Click **Next** to continue.
5. Use the **>>** button to bring all entries from the **Available Tables** list box into **Export to SQL Server** list box. Click **Next** to continue.
6. In the **Table Attributes** group, check **Indexes, Validation Rules, Defaults,** and **Table Relationships.** Select the **Use triggers** radio button. In the **data options,** group select **No, never** for the table timestamp fields, and uncheck the **only create the table structure** check box. Click **Next** to continue.
7. Click **Finish.** When the wizard finishes, close Microsoft Access.

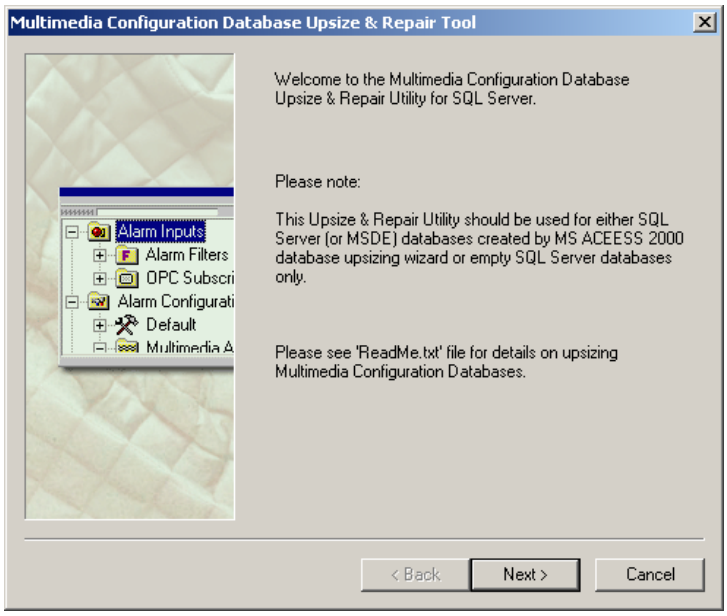


Figure D.5. Multimedia Upsize and Repair Tool: Step 1

D.3.1 Using the Multimedia Upsize and Repair Tool

Now run the Multimedia configuration database **Upsize and Repair Tool** to verify the table structure of the newly created SQL Server database. The Upsize and Repair Tool will also fix some triggers and index problems that were skipped by the Microsoft Access Upsizing Wizard. The Upsize and Repair Tool is located on the SMAR Product CD under the "Tools/MMX_SQLUpsizing" folder. Open the "MMXSqlRepair.exe" file in this folder.

1. When "MMXSqlRepair.exe" loads, click the **Next** button at the bottom of the dialog box, as shown in **Figure D.5.**
2. Click the **Log On SQL Server** button to connect to the upsized database (the one created by the Access Upsizing Wizard), as shown in **Figure D.6.** Provide the administrative login name and password. When a connection to the SQL Server database is established, the traffic light indicator turns green, and the **Next** button becomes enabled. Click the **Next** button to continue.

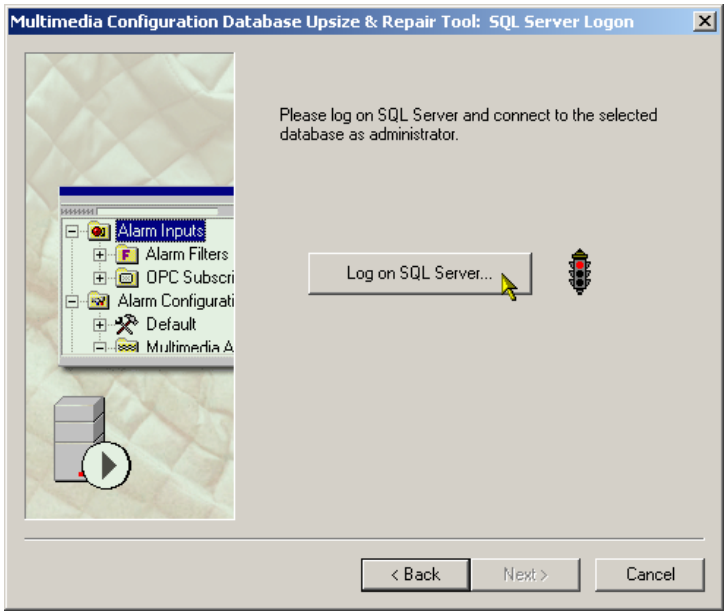


Figure D.6. Multimedia Upsize and Repair Tool: Step 2

3. Click the **Go!** button to start the verification and repair processes. If the Upsize and Repair Tool discovers that any table is missing, it will create that table and provide default data.
4. When the Upsize and Repair Tool finishes, it will prompt you to create a Universal Data Link (.udl) file. If for any reason the Upsize and Repair Tool fails to write the .udl file, the file can be created manually, as described in the "Creating a Universal Data Link File" section above.

5. Start the AlarmWorX Multimedia Configurator, and select **Open** from the **File** menu. Browse to the folder where you created the .udl file. Open the .udl file as you would open a regular .mdb database file. The Multimedia Configurator will recognize the connection information and connect to the upsized configuration database. Select **Make Active** from the **File** menu. If the Multimedia Server is already running, click the **Server Update** button on the toolbar.

D.4 Upsizing an Existing Microsoft Access Database

You can upsize an existing Microsoft Access (.mdb) Multimedia database by exporting a .csv file. This upsizing method does not require installation of Microsoft Office 2000.

1. Start the Multimedia Configurator and open the .mdb configuration database that you want upsize. Select **Export CSV** from the **File** menu, and choose the .csv file for temporary storage of configuration data, as shown in **Figure D.7.** Click **OK.**
2. Use the SMAR MSDE Manager Tool to create a new empty SQL Server (or MSDE) database.

   Note: The MSDE Manager (MSDE Manager.exe) is installed in the ProcessView/Bin directory during ProcessView installation. If you have a stand-alone AlarmWorX Multimedia installation, you will need to install the MSDE Manager manually by running the ProcessView installation and selecting the TrendWorX component from the list of components to install.
3. Run the Multimedia Configuration Database Upsize and Repair Tool ("MMXSqlRepair.exe") on the database created in step 2 above.
4. Click the **Next** button at the bottom of the form.
5. Click the **Log On** button to connect to the newly created database. Provide the administrative login name and password. When a connection to the SQL or MSDE database is established, the traffic light indicator turns green, and the **Next** button becomes enabled. Click **Next.**
6. Click the **Go!** button. When the Upsize and Repair Tool finds that no tables exist in the database, it will create the proper table structure with the necessary relationship data.
7. When the Upsize and Repair Tool finishes, it will prompt you to create a Universal Data Link file. If for any reason the Upsize and Repair Tool fails to write the .udl file, the file can be created manually, as described in the "Creating a Universal Data Link File" section above.

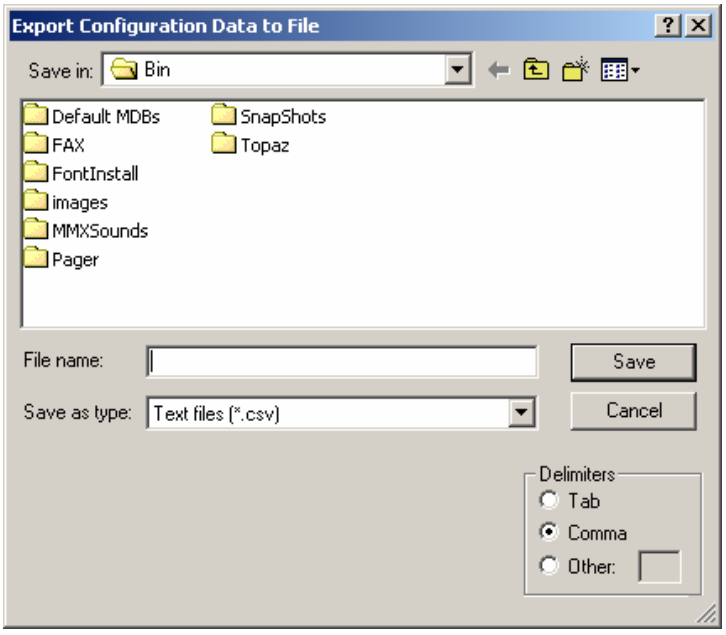


Figure D.7. Exporting Configuration Data to a .csv File

8. Start the AlarmWorX Multimedia Configurator, and select **Open** from the **File** menu. Browse to the folder where you created the .udl file. Open the .udl file as you would open a regular .mdb database file. The Multimedia Configurator will recognize the connection information and connect to the newly created database. You will see only top level (folder) items in the Configurator's tree control at this point.

9. Select **Import CSV** from the **File** menu, and browse to the folder where you saved the .csv file in step 1 above, as shown in **Figure D.8.** Make sure you use the same delimiter option that was used while exporting the .csv file. Check all check boxes in the **Import Settings** group.

10. Open the .csv file you saved file in step 1 above. The exported data will be copied to the currently edited database. Select **Make Active** from the **File** menu. If the Multimedia Server is already running, click the **Server Update** button on the toolbar.

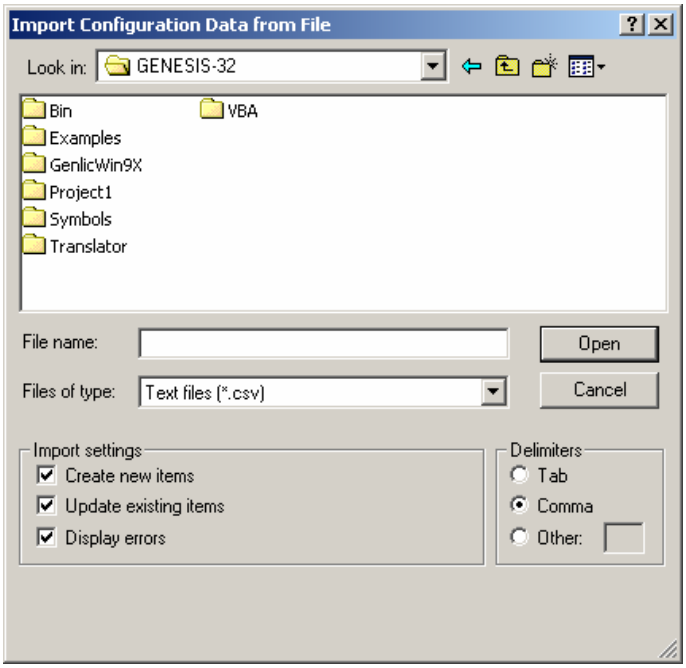


Figure D.8. Importing Configuration Data From a .csv File

D.5 Auto-Starting the SQL Service

When upsizing databases, you must set the SQL service to auto-start:

1. Double click on the SQL Server icon in the system tray to open the SQL Server Service Manager, as shown in **Figure D.9.**
2. Make sure that **Auto-start service when OS starts** check box is checked.
3. Close the SQL Server Service Manager dialog.

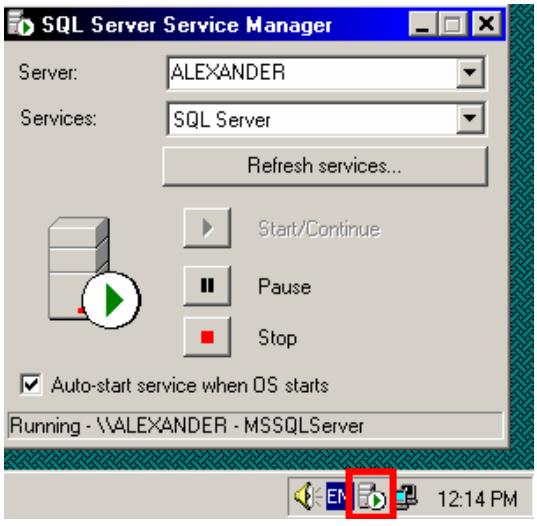


Figure D.9. Auto-Start Enabled for SQL Service

Instant Messaging and E-Mail

E.1 Installing MSN Messenger Service

The Instant Messaging Agent allows you to send and acknowledge alarm and event information using MSN® Messenger Service. In order to use the Instant Messaging Agent, you must download and install the MSN Messenger Service from the MSN Web site at http://messenger.msn.com/.

1. When the download is completed, run the "mmssetup.exe" file and follow the instructions provided by the installation wizard.

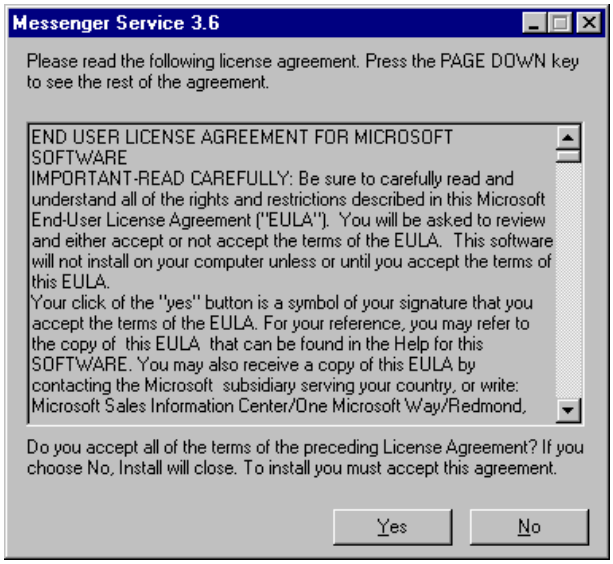


Figure E.1. Messenger Service License Agreement

2. Read the Messenger Service 3.6 License Agreement, as shown in **Figure E.1.** If you agree with the terms, click the **Yes** button to continue. The installation will copy files to your system.
3. You will have to restart your computer before the new settings will take effect. The installation will ask you if you want to restart the computer. Click the **Yes** button.
4. When your computer restarts, the MSN Messenger Service Welcome screen will appear, as shown in **Figure E.2.** Click the **Next** button to continue.

Figure E.2. MSN Messenger Service Welcome Screen

5. The next screen will ask you to sign in using a Microsoft Passport, as shown in **Figure E.3.** If you have a Hotmail user account with Microsoft, you can use that account as your Passport. If you do not have a Passport, click the **Get a Passport** Button. This will take you to the MSN Messenger Service Web site, where you can sign up for a Passport. Enter the required information in the user profile fields, and follow the instructions provided.

Figure E.3. Signing up for a Passport

6. Once you have established a Passport, you will be asked to provide your Passport for the installation, as shown in **Figure E.4.** Enter your **Sign-in name** and **Password.** Click the **Next** button to continue.

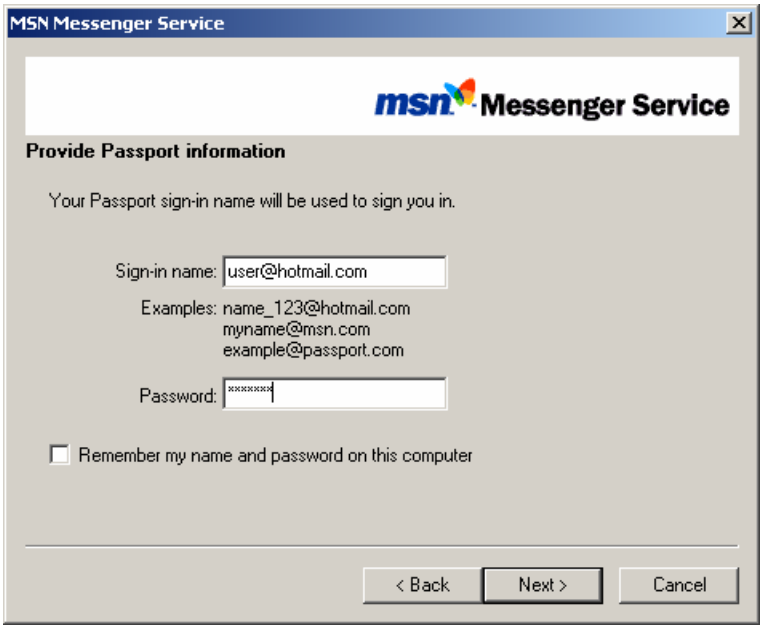


Figure E.4. Entering Your Passport Information

7. A dialog box will appear informing you that the setup is complete. Click the **Finish** button to sign in to MSN Messenger Service.

E.2 Configuring MSN Messenger Service

Once you have signed in, the MSN Messenger Service dialog box will open, as shown in **Figure E.5.** Select **Options** from the **Tools** menu. This opens the **Options** dialog box, shown in **Figure E.6.**

Note: To get more information, you can view the MSN Messenger Service help documentation at any time by selecting **Help Topics** from the **Help** menu.

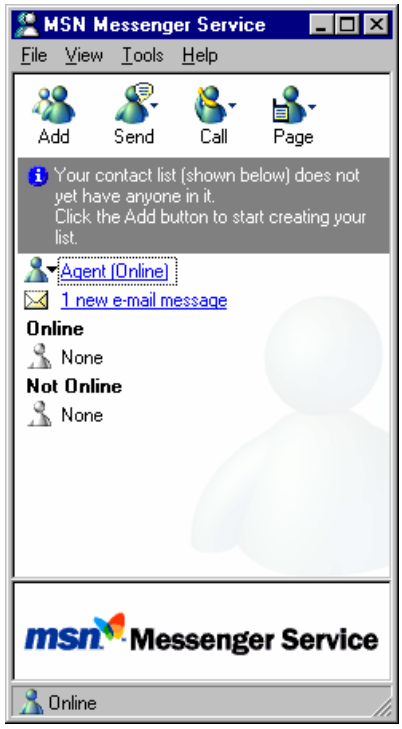


Figure E.5. Messenger Service Dialog Box

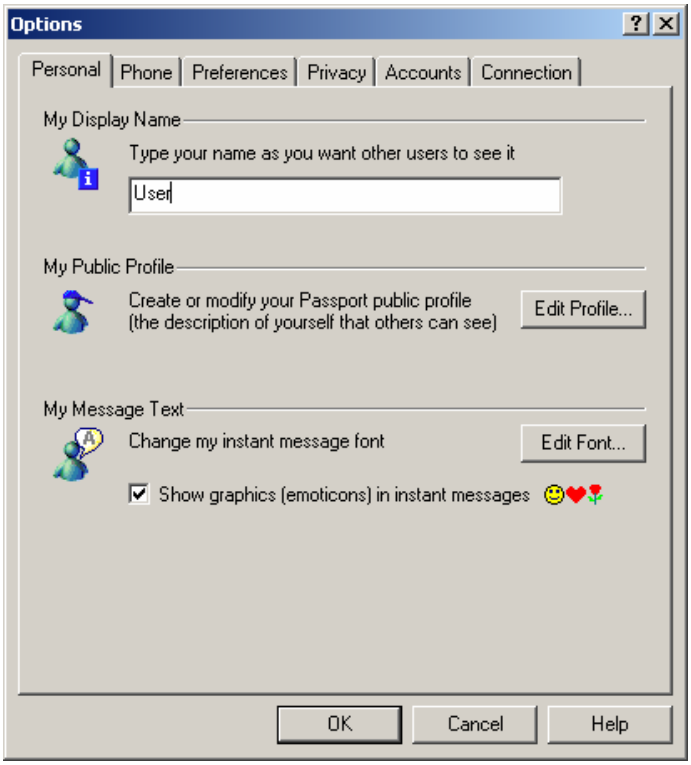


Figure E.6. Messenger Options: Personal Tab

In the **Personal** tab of the **Options** dialog box, enter the name that you want to use, as shown in Figure E.6. You can also edit your user profile and change the font of your message text. Click the **Help** button for additional information.

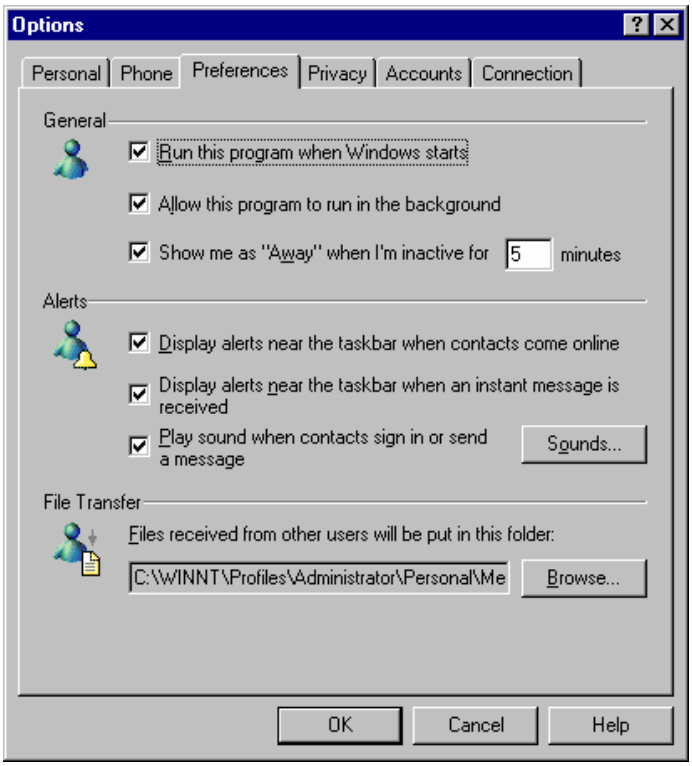


Figure E.7. Messenger Options: Preferences Tab

In the **Preferences** tab of the **Options** dialog box, you can configure the general settings and determine how you are alerted when you receive a message, as shown in **Figure E.7.** By clicking the **Browse** button, you can also select the folder in which incoming files will be stored. Click the **Help** button for additional information as needed. Click **OK** when you are finished.

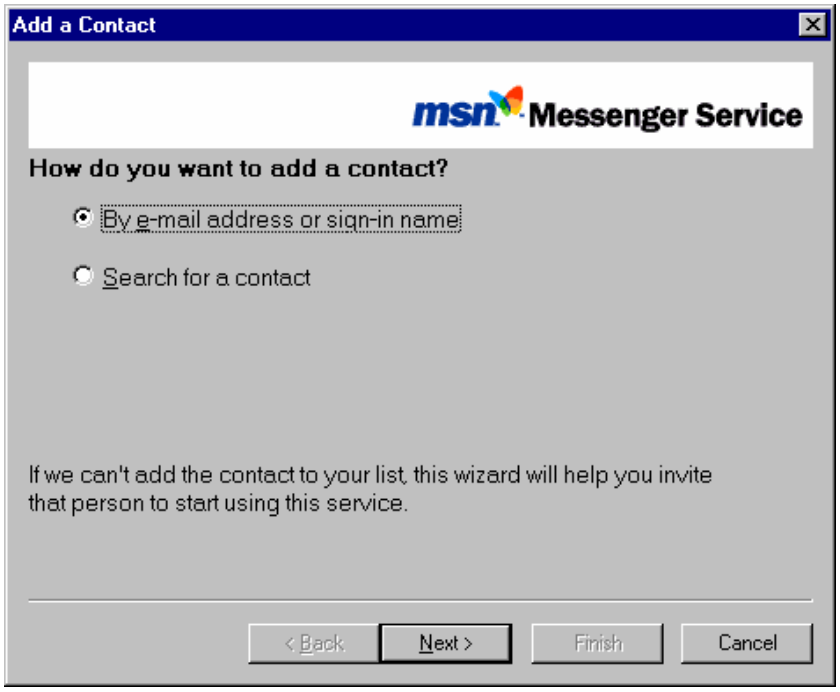


Figure E.8. Adding a New Contact to MSN Messenger Service

The changes to your settings will take effect the next time you sign in to MSN Messenger Service. To add a new contact to MSN Messenger Service, select **Add a Contact** from the **File** menu. This will open a wizard that enables you to configure a new contact, as shown in **Figure E.8.** Click the **Next** button to continue.

Enter the complete e-mail address of the contact you would like to add, as shown in **Figure E.9.** Click the **Next** button to continue. A dialog box will appear informing you that e-mail address of the contact you entered has been added to your list of contacts. Click the **Finish** button to close the **Add a Contact** wizard. The contact will be added to the MSN Messenger Service screen.

For information on how to acknowledge alarms using the MSN Messenger Service, see the "Acknowledging Alarms" section below.

Note: For the Instant Messaging Agent to work, MSN Messenger Service must be installed and running on the computer on which the Instant Messaging Agent is installed. The user name specified in the **Send To** field of the Instant Messaging Agent configuration in the Multimedia Configurator must also be an existing contact in the server computer's messaging client that is currently online.

Note: Adding e-mail contacts to MSN Messenger is for instant messaging only. It does not affect the e-mail contacts you have configured for the E-mail Agent in the M-Alarm Multimedia Configurator.

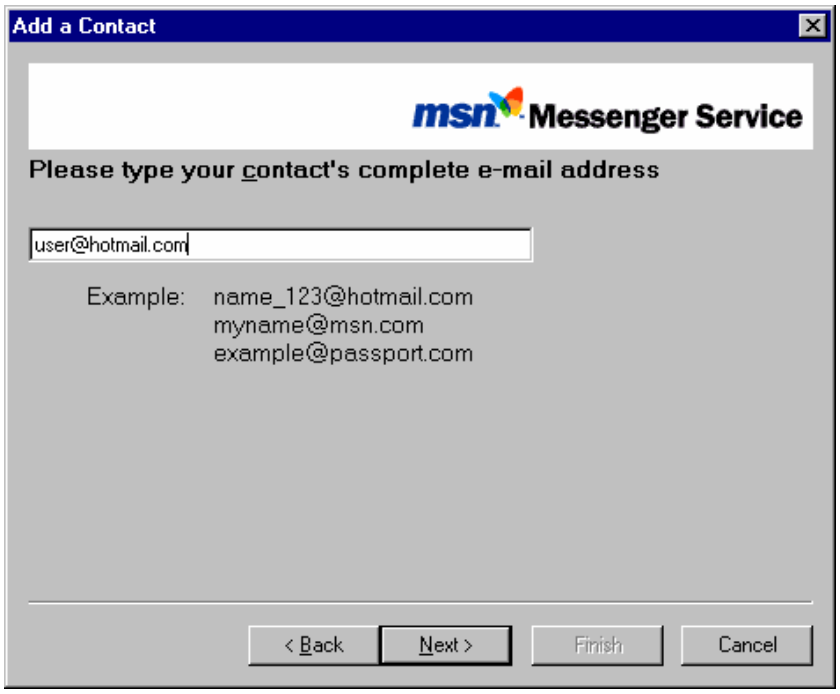


Figure E.9. Entering the Contact's E-mail Address

E.3 Creating Instant Messaging Templates

When configuring the Instant Messaging Agent in the Multimedia Configurator, you must select a template to apply to that agent. Templates allow you to configure design elements, including what and how much information to display when presenting an alarm. You can use or modify any one of the default templates or create a new template.

The Multimedia Configurator provides a default template for the Instant Messaging Agent. To view this template, select **Alarm Configurations - Media Templates - Default Instant Messenger** from the tree control. The instant messenger template field will be displayed in the right pane, as shown in **Figure E.10.**

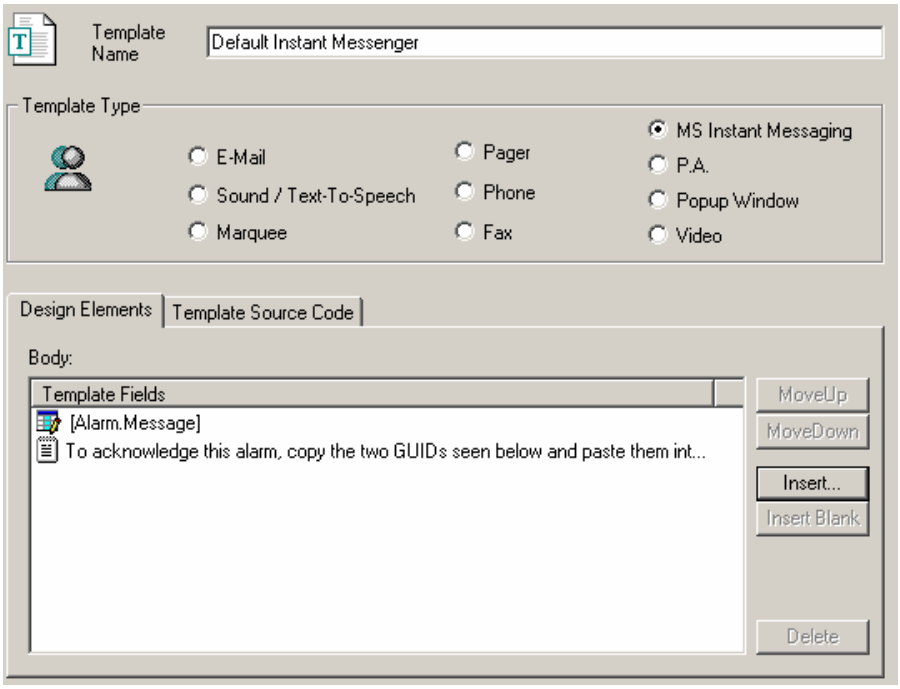


Figure E.10. Default Template for Instant Messaging Agent

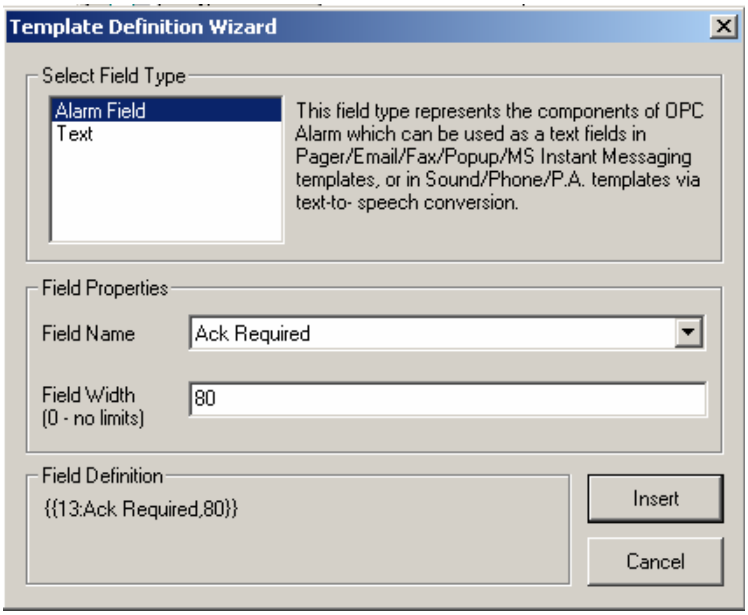


Figure E.11. Template Definition Wizard

You can create a new template for the Instant Messaging Agent by right-clicking the **Media Templates** folder in the tree control and selecting **New - Media Template** from the pop-up menu. Select the MS Instant Messaging radio button in the template configuration field in the right pane, as shown in Figure E.10.

In the **Design Elements** tab of the template configuration dialog box, shown in Figure E.10, click the **Insert** button. This opens the **Template Definition Wizard** dialog box, shown in **Figure E.11,** which contains a list of available field types to add. (For a complete list of available field types, please refer to **Chapter 5.**) Choose a field type and select from the additional options under **Field Properties,** and then click **Insert.** If you wish to change the order of the fields or to delete a field, use the appropriate buttons to do so. The **Insert Blank** button will insert a line break.

All current template fields are displayed in the **Design Elements** tab (see Figure E.10). The **Field Definition** for these template fields is also displayed in the **Template Source Code** tab, shown in **Figure E.12,** where you can manually edit a template field if desired.

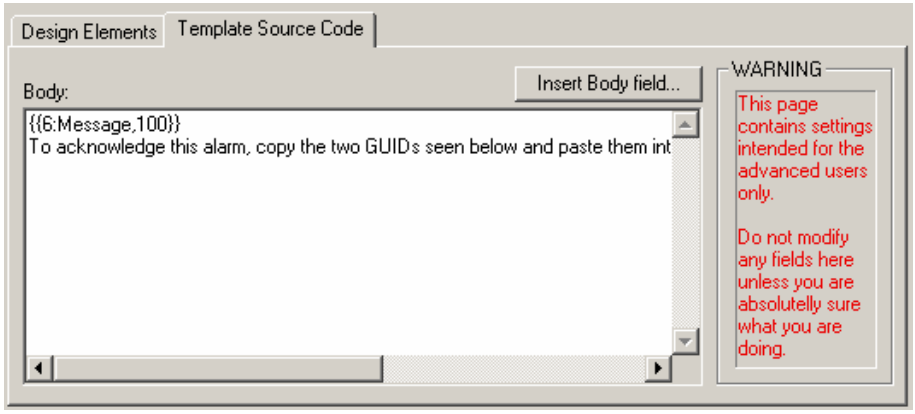


Figure E.12. Template Source Code Tab

Note: The **Template Source Code** tab is recommended for advanced users only. Do not modify any fields here unless you are absolutely sure of what you are doing.

For information about how to acknowledge alarms using the MSN Messenger Service, see the "Acknowledging Alarms" section below.

E.4 Creating E-mail Templates

The E-mail Agent allows you to send and acknowledge alarm and event information using an e-mail message. When configuring the E-mail Agent, you must select a template to apply to that agent. Templates allow you to configure design elements, including what and how much information to display when presenting an alarm. You can use or modify any one of the default templates or create a new template.

The Multimedia Configurator provides a default template for the E-mail Agent. To view this template, select **Alarm Configurations - Media Templates - Default E-mail** from the tree control. The e-mail template field will be displayed in the right pane, as shown in **Figure E.13.**

You can create a new template for the E-mail Agent by right-clicking the **Media Templates** folder in the tree control and selecting **New - Media Template** from the pop-up menu. Select the **E-mail** radio button in the template configuration field in the right pane, as shown in Figure E.13.

In the **Design Elements** tab of the template configuration dialog box, shown in Figure E.13, click the **Insert** button. This opens the **Template Definition Wizard** dialog box, shown in **Figure E.14,** which contains a list of available field types to add. (For a complete list of available field types, please refer to **Chapter 5.**) Choose a field type and select from the additional options under **Field Properties,** and then click **Insert.** If you wish to change the order of the fields or to delete a field, use the appropriate buttons to do so. The **Insert Blank** button will insert a line break.

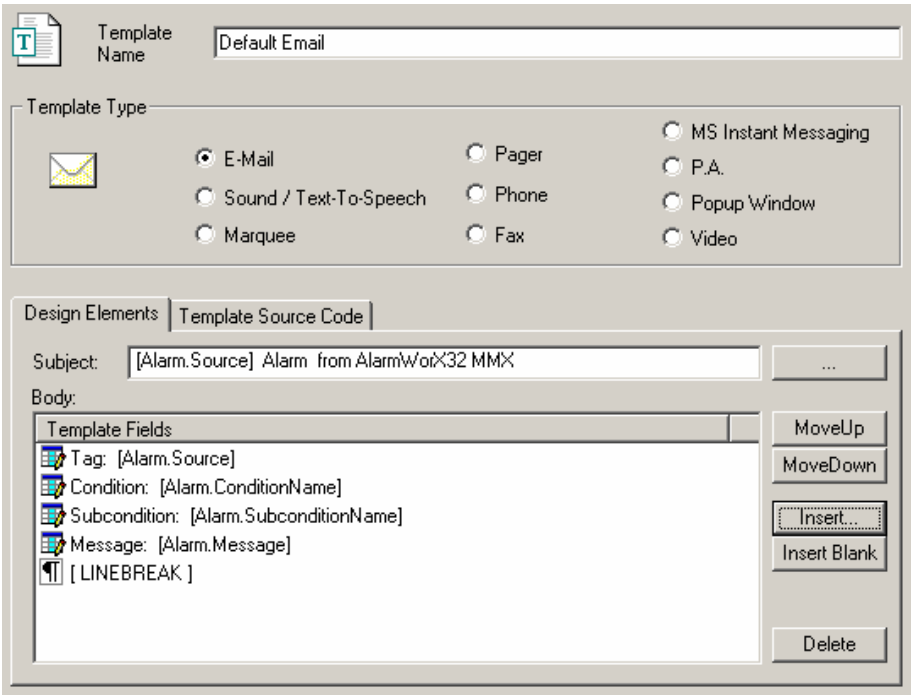


Figure E.13. Default Template for E-Mail Agent

The **Template Definition Wizard** dialog box gives you the option of sending files as attachments to e-mail messages, as shown in Figure E.14. Click the **Browse** button to choose a file to attach. Select the file and then click **OK.** The file pathway will appear in the **Field Definition** section.

All current template fields are displayed in the **Design Elements** tab (see Figure E.13). The **Field Definition** for these template fields is also displayed in the **Template Source Code** tab, shown in **Figure E.15,** where you can manually edit a template field if desired.

Note: The **Template Source Code** tab is recommended for advanced users only. Do not modify any fields here unless you are absolutely sure of what you are doing.

For information about how to acknowledge alarms using e-mail, see the "Acknowledging Alarms" section below.

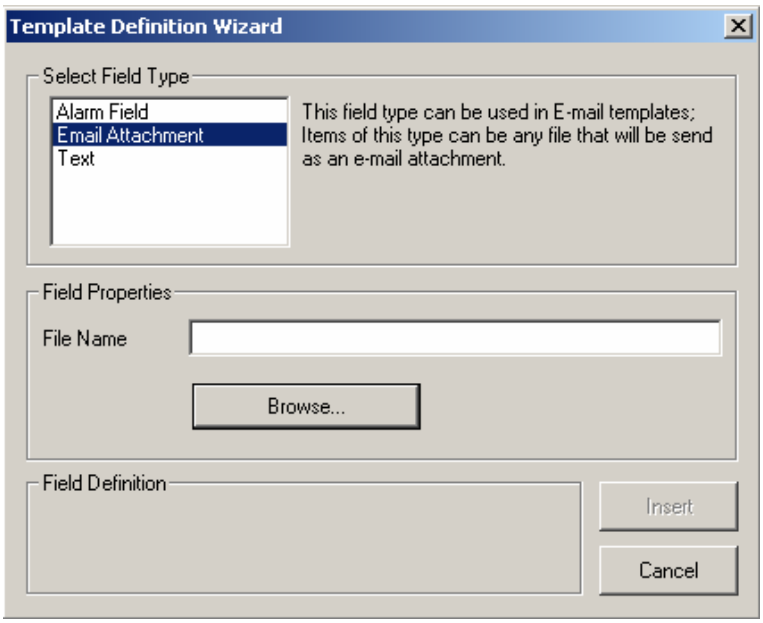


Figure E.14. Template Definition Wizard

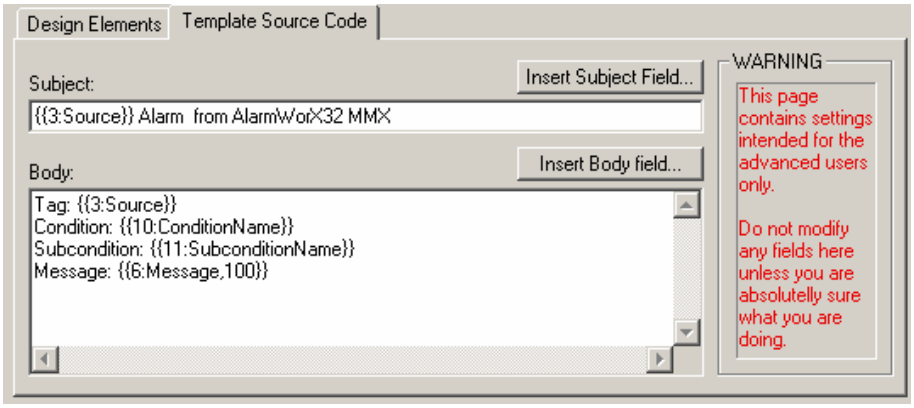


Figure E.15. Template Source Code Tab

E.5 Acknowledging Alarms Using E-mail and Instant Messaging

You can acknowledge alarms using the Instant Messaging Agent and E-mail Agent by referencing the Acknowledge Code, or PIN, that you specified in the configuration for each agent. (For details about configuration fields for the Instant Messaging Agent and the E-mail Agent, please refer to **Chapter 4.**) For example, in the configuration field for the Instant Messaging Agent shown in **Figure E.16,** the **Acknowledge Code** is "12345."

Once your alarm configuration is complete and the Multimedia Server is started, you can use this code to acknowledge alarms sent by the Multimedia Server. The Multimedia Server sends messages based on the templates you created for the Instant Messaging Agent and the E-mail Agent.

For the Instant Messaging Agent, the Multimedia Server sends alarms via the MSN Messenger Service. For the E-mail Agent, the Multimedia Server sends alarms via e-mail messages using, for example, Microsoft Outlook. An example alarm message is shown below.

```
4/8/01 9:50:57 AM
Tag: BugsAttack
Condition: Limit
Subcondition: HI
Message: Too many Bugs

||3d6efc37-79d8-11d4-846d-00104b6fd496||
||bb7ee6fa-2c1d-11d5-8146-0050da1bf676||
```

This alarm message is based on the following multimedia template:

```
{{4:Time,80}}
Tag: {{3:Source}}
Condition: {{10:ConditionName}}
Subcondition: {{11:SubconditionName}}
Message: {{6:Message,100}}
```

Each alarm message includes one or more Global Unique Identifiers, or GUIDs. A **GUID** is a string of characters surrounded by the symbol '**||**', as shown in the example above. In this case, the Multimedia Server included the following two GUIDs:

3d6efc37-79d8-11d4-846d-00104b6fd496

bb7ee6fa-2c1d-11d5-8146-0050da1bf676

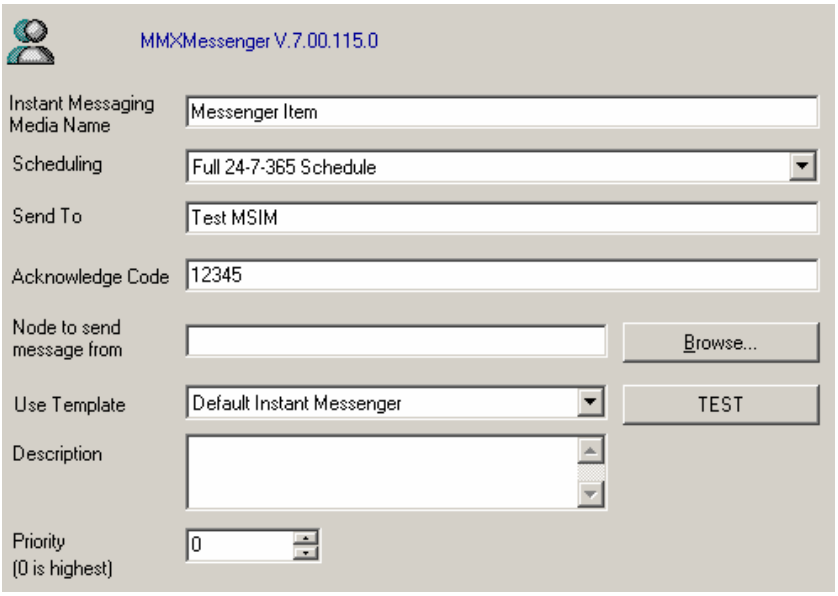


Figure E.16. Configuration Field for Instant Messaging Agent

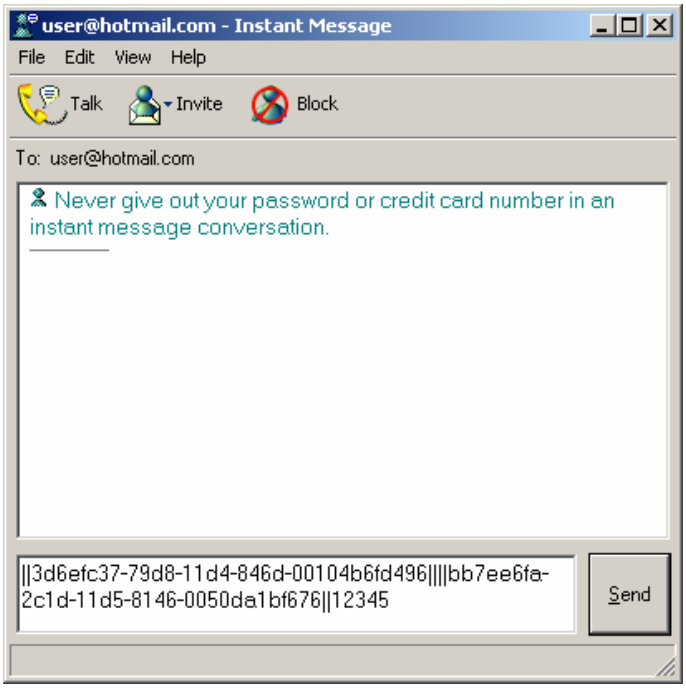


Figure E.17. Acknowledging an Alarm Using MSN Messenger Service

To acknowledge the alarm in MSN Messenger Service, copy and paste the two GUIDs into the "Send" field and append the Acknowledge Code, or PIN, to them, as shown in **Figure E.17.** In this example, the Acknowledge Code is "12345." Click the **Send** button to send the alarm acknowledgement back to the Multimedia Server.

For the E-mail Agent, the method for acknowledging alarms in e-mail messages is similar to the method described above. When the E-mail Agent receives an alarm e-mail message from the Multimedia Server, you can acknowledge the alarm by replying to the e-mail message. As described above, copy and paste the GUIDs into the body of the e-mail reply and append the Acknowledge Code, or PIN, to the GUIDs.

E.6 Modifying E-mail Support

The Email agent uses HKEY_LOCAL_MACHINE\SOFTWARE\SMAR\Awx32\AWXMMX32\MMXMail\ReadDelete registry setting for modifying e-mail acknowledge support.

ReadDelete = 1 – Prompts the E-mail Agent to read all inbox e-mails. e-mails are marked read. No e-mails are deleted. This mode is good for development and testing purposes.

ReadDelete = 2 - Prompts the E-mail Agent to read all inbox e-mails. e-mails are marked read. Deletes all read e-mails. Provides improved operation times and should be used with a deployed system requiring acknowledge support.

ReadDelete = 3 - Prompts the E-mail Agent to read all inbox e-mails. E-mails are marked read. Deletes all e-mails with acknowledge string. Used when the e-mail agent shares the e-mail account with another application. Not recommended for a deployed system.

ReadDelete = 4 – E-mail Agent does not read any e-mails. This mode disables the acknowledge string and acknowledge support. This mode is ideal for deployed systems not making use of e-mail acknowledge support.

Occasionally the E-mail Agent will trigger the following dialog message:

“Either there is no default mail client or the current mail client cannot fulfill the messaging request. Please run Microsoft Outlook and set it as the default mail client.*Microsoft Outlook“

This message is set by the Windows operating system. It can be disabled by modifying the following registry value from:

HKEY_LOCAL_MACHINE\SOFTWARE\Clients\Mail\ PreFirstRun

to

HKEY_LOCAL_MACHINE\SOFTWARE\Clients\Mail\ PreFirstRun1.

In addition the registry value

HKEY_LOCAL_MACHINE\SOFTWARE\Clients\Mail\ (Default)

Display the name of the default e-mail application. The default e-mail application can be modified by either changing the registry string or using Microsoft Internet Explorer (specifically **Tools** > **Internet Options > Programs > Email).**

The E-mail Agent will only operate on e-mail messages in the e-mail programs default folder. For example, a reply with an acknowledge code will only be seen if sent to the default e-mail programs folder (Inbox for Microsoft Outlook). If you set up your e-mail program to reroute your mail to other various folders, the E-mail Agent might not read the incoming e-mail message.

Note: You must have a MAPI-compliant third-party e-mail program on the computer from which you are sending e-mails. Microsoft® Outlook is an example of a MAPI-compliant third party e-mail program. Microsoft Outlook Express can also be used and can be downloaded for free from Microsoft. However, unlike Outlook, Outlook Express will only work with POP3 e-mail servers. It is not necessary to have the e-mail program actively running on a Windows NT or Windows 2000 operating system. It is, however, necessary to have the e-mail program actively running on a Windows 98 operating system. Outlook 2002 and Outlook Express version 6 require additional security settings in order for the E-mail Agent to work properly. For more information, go to http://www.microsoft.com/office/ork/xp/appndx/appa11.htm.