



Your comments and suggestions on the operation of this software are welcome. Please address them to:

ICONICS

100 Foxborough Blvd.

Foxborough, MA 02035

Tel: 508-543-8600

Fax: 508-543-1503

E-mail: support@iconics.com

Web: www.iconics.com

© ICONICS, Inc. All rights reserved.

Introduction

The AlarmWorX32 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 AlarmWorX32 Server are sent to any OPC Alarm and Event clients that subscribe. The AlarmWorX32 Viewer and the AlarmWorX32 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 (Awx32Svr.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 **Awx32Svr.mdb** located in the same directory as the server application. During runtime the server polls the configuration database for changes, so configuration may be done on the fly without stopping the server.

The Server Configurator Application (Awx32ServerConfigurator.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 AlarmWorX32:

Awx32Svr.exe	Server application/service
Awx32ServerConfigurator.exe	Server Configurator
Awx32Svr.mdb	Server configuration database

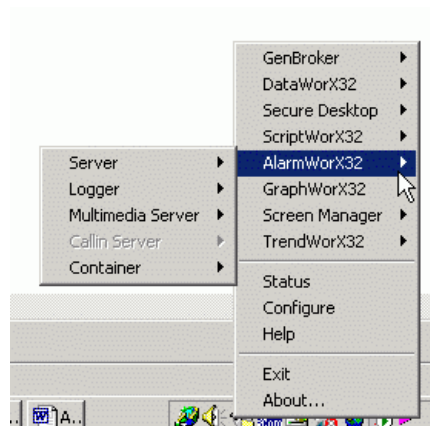
The files are installed in the Bin directory chosen during the installation. A program icon is installed for the Configurator in the AlarmWorX32 program group.

By default the Server (Awx32Svr.exe) is registered as a normal application, but can be registered to run as a service. 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.

To register the Server as a Windows service:

1. Run the **GenTray** utility from the Windows **Start** menu by selecting **Programs > ICONICS GENESIS-32 > Tools > GenTray**.
2. This opens GenTray and puts the **GenTray** icon in the taskbar system tray. Click the **GenTray** icon in the system tray and select **AlarmWorX32 > Sever > NT Service**, as shown in the figure below. To have the service start automatically upon system startup, click the **GenTray** icon in the system tray and select **AlarmWorX32 > Sever > Auto Start**.



Running AlarmWorX32 Server From GenTray

The **GenTray** 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 GenTray or by activation by an OPC Alarm Client), it will remain running until both of the following conditions are met:

- The GenTray 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 98, GenTray can be used to facilitate the starting of the Alarm Server on startup:

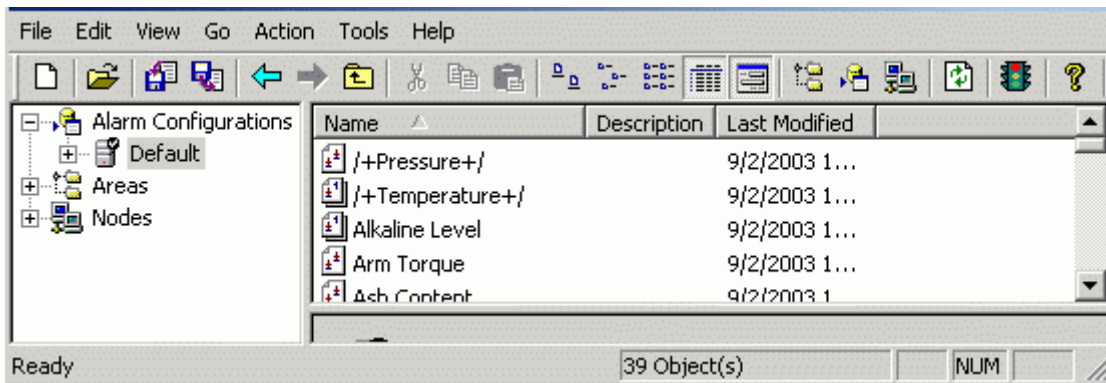
1. Place a shortcut to the **GenTray** utility in the startup group so **GenTray** will start automatically when Windows 98 boots up.
2. To have the Alarm Server start automatically when GenTray starts, click the **GenTray** icon in the system tray and select **AlarmWorX32 > Sever > Auto Start**.

Starting the Alarm Server Configuration

AlarmWorX32 Server Configurator is an application used to create and maintain an alarm tag database for use by the AlarmWorX32 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.

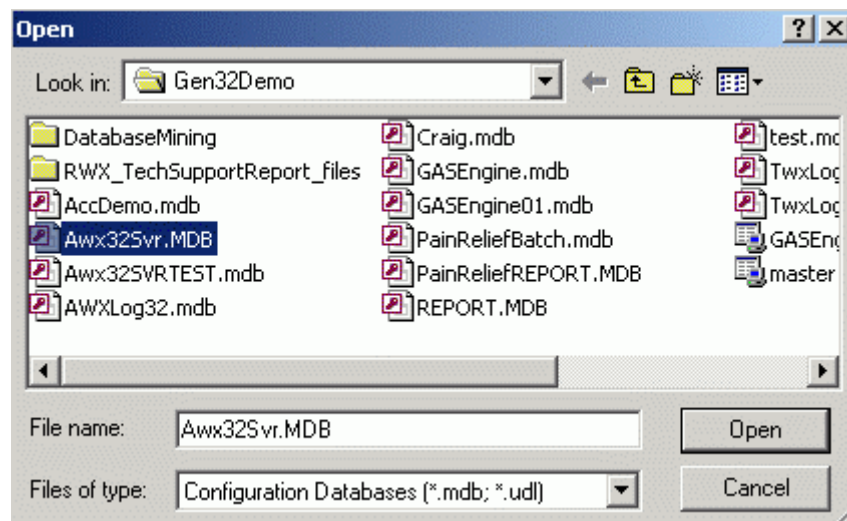
To launch the AlarmWorX32 Server Configurator from the Windows Start menu:

1. Select **Programs > ICONICS GENESIS-32 > AlarmWorX32 > Alarm Server Configurator**.
2. 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

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.

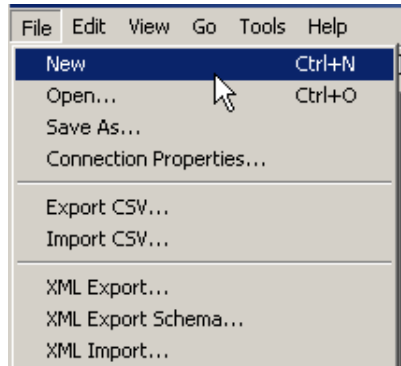


Selecting a Configuration Database

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:

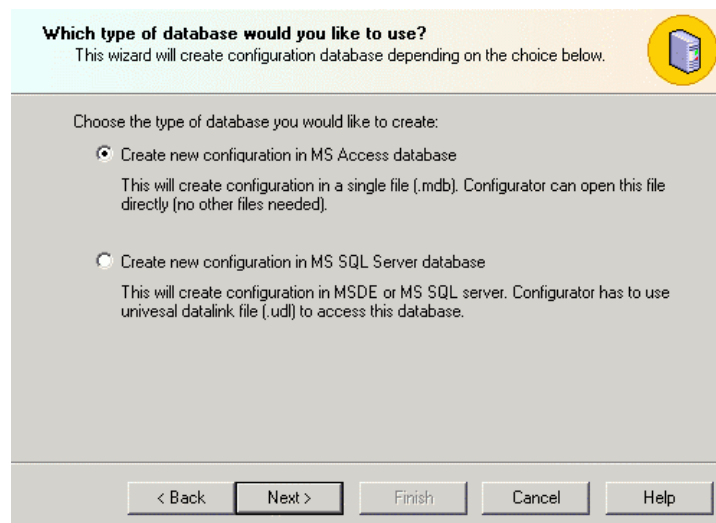
1. Select **New** from the **File** menu, as shown in the figure below.



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**.

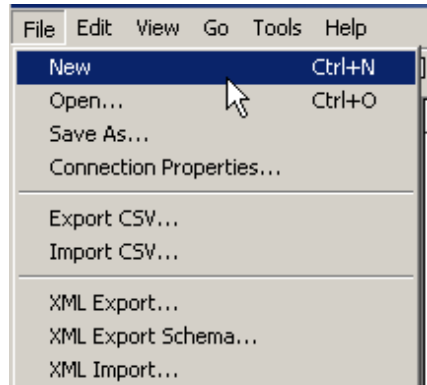


Choosing the Type of Database To Create

Creating a Microsoft Access Configuration Database

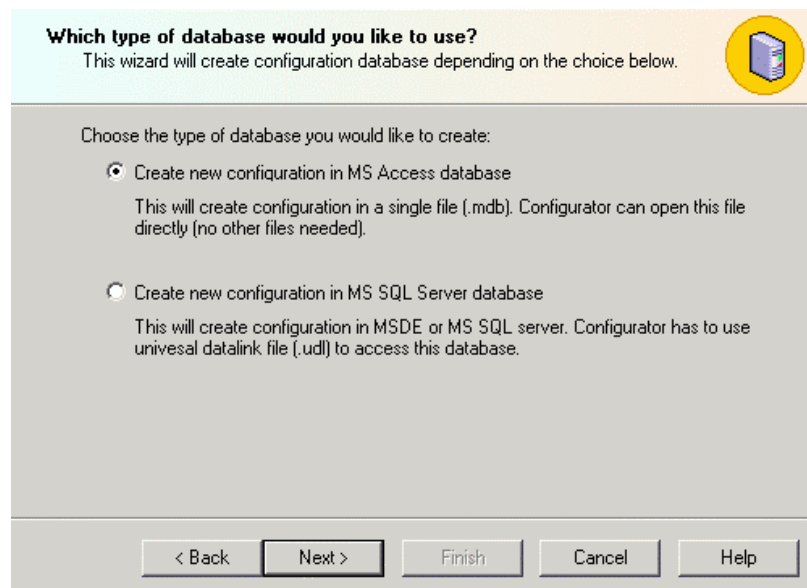
To create a new Microsoft Access configuration database in the Configurator:

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



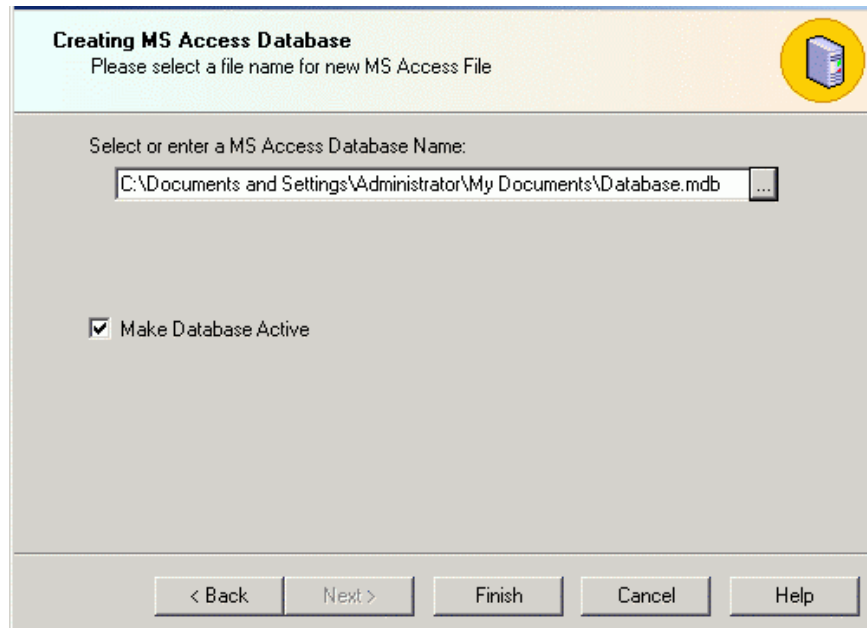
Creating a Configuration Database

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**.



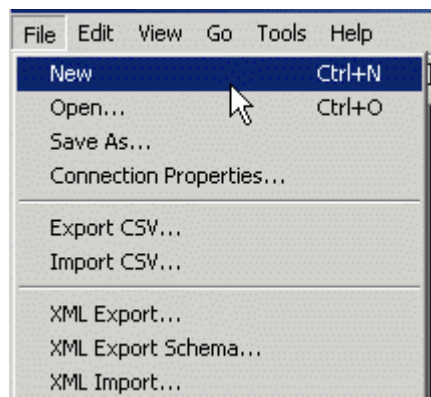
Naming the New Access Database

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.

Which type of database would you like to use?
This wizard will create configuration database depending on the choice below.

Choose the type of database you would like to create:

☐ Create new configuration in MS Access database
This will create configuration in a single file (.mdb). Configurator can open this file directly (no other files needed).

☒ Create new configuration in MS SQL Server database
This will create configuration in MSDE or MS SQL server. Configurator has to use univesal datalink file (.udl) to access this database.

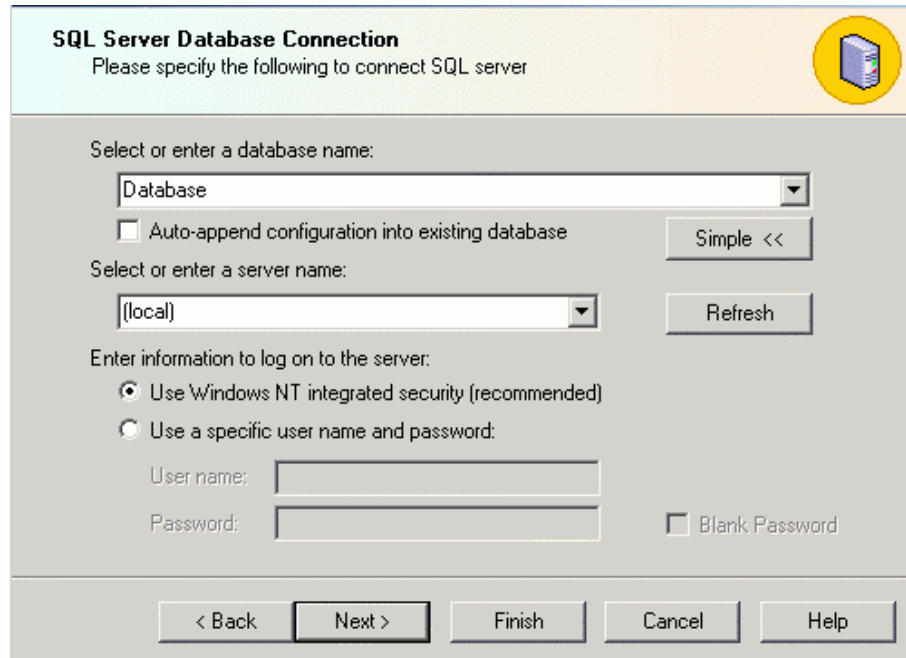
< Back Next > Finish Cancel Help

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.



SQL Server Database Connection
Please specify the following to connect SQL server

Select or enter a database name:

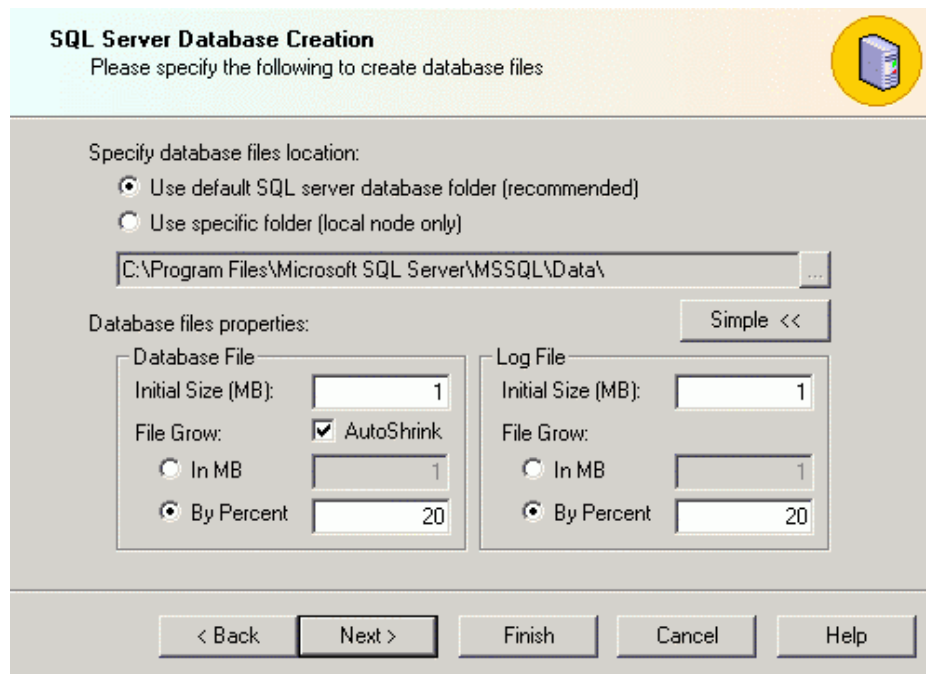
☐ Auto-append configuration into existing database

Select or enter a server name:

Enter information to log on to the server:
☒ Use Windows NT integrated security (recommended)
☐ Use a specific user name and password:
 User name:
 Password: ☐ Blank Password

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.



SQL Server Database Creation
Please specify the following to create database files

Specify database files location:
☒ Use default SQL server database folder (recommended)
☐ Use specific folder (local node only)

Database files properties:

Database File		Log File	
Initial Size (MB):	1	Initial Size (MB):	1
File Grow:	☒ AutoShrink	File Grow:	☐ In MB
☐ In MB	1	☐ In MB	1
☒ By Percent	20	☒ By Percent	20

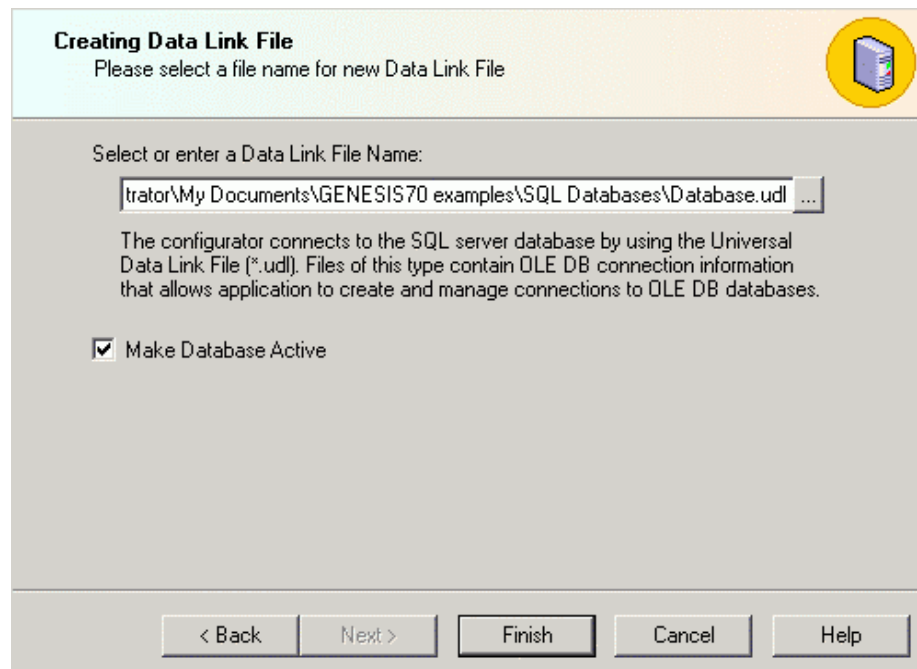
Specifying the Database Location and Properties

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**.



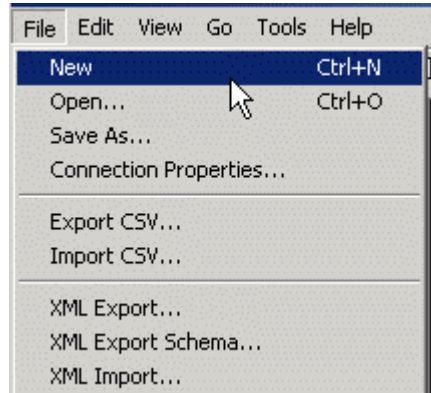
Creating a Universal Data Link File

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

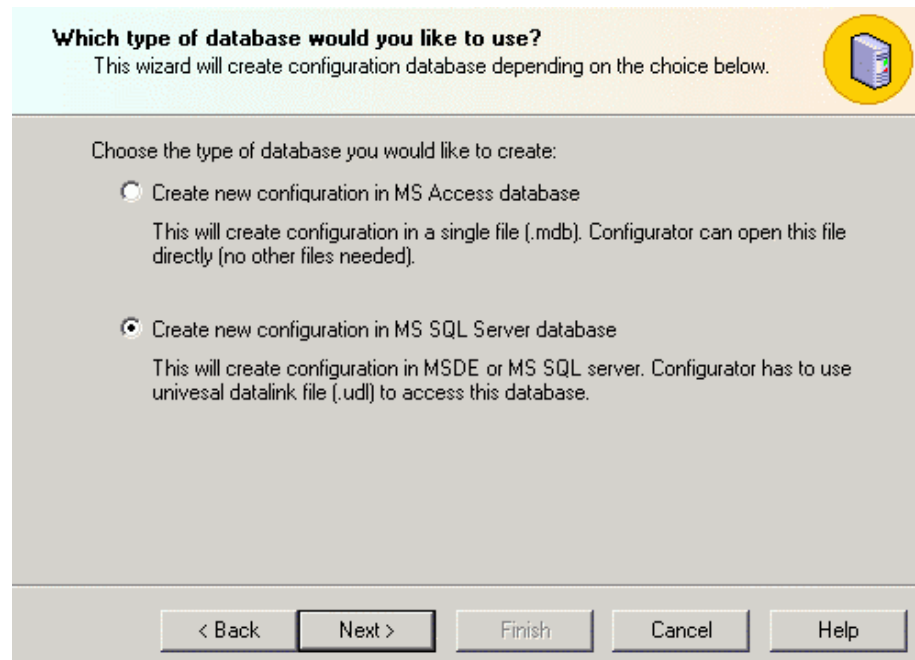
The Configuration Database Wizard also gives you the option to add the configuration database structure to an existing Microsoft SQL Server database:

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



Creating a Configuration Database

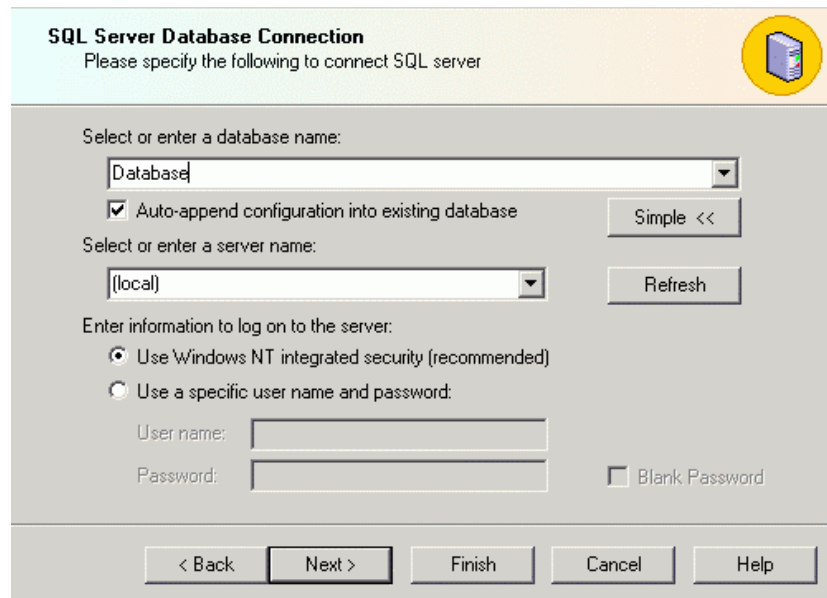
2. The introduction screen for the Configuration Database Wizard appears. Click the **Next** button to continue.
3. You have two options for creating your new database, as shown in the figure below. Select **Create new configuration in MS SQL Server database**. Click the **Next** button to continue.



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.

One or more configuration tables already exist in chosen database
What would you like to do?

☒ **Select different database name (recommended)**
This will provide you to specify different database name. Use this option when you are not sure what is the content of chosen database.

☐ **Use database structure as it is**
This will not change anything in selected database. Use this option if you want to create a new datalink (.udl) file only.

☐ **Override all existing configuration tables**
Caution: This may cause that other application will stop working. Use this option when you are absolutely sure that the database is not use by other applications.

< Back Next > Finish Cancel Help

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**.

SQL Server Database Connection
Please specify the following to connect SQL server

Select or enter a database name:
Renamed Database

☒ Auto-append configuration into existing database Simple <<

Select or enter a server name:
(local) Refresh

Enter information to log on to the server:
☒ Use Windows NT integrated security (recommended)
☐ Use a specific user name and password:
 User name:
 Password: ☐ Blank Password

< Back Next > Finish Cancel Help

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.

SQL Server Database Creation
Please specify the following to create database files

Specify database files location:

☒ Use default SQL server database folder (recommended)
☐ Use specific folder (local node only)

C:\Program Files\Microsoft SQL Server\MSSQL\Data\ ...

Database files properties: Simple <<

Database File
Initial Size (MB): 1
File Grow: ☒ AutoShrink
☐ In MB 1
☒ By Percent 20

Log File
Initial Size (MB): 1
File Grow: ☐ In MB 1
☒ By Percent 20

< Back Next > Finish Cancel Help

Specifying the Database Location and Properties

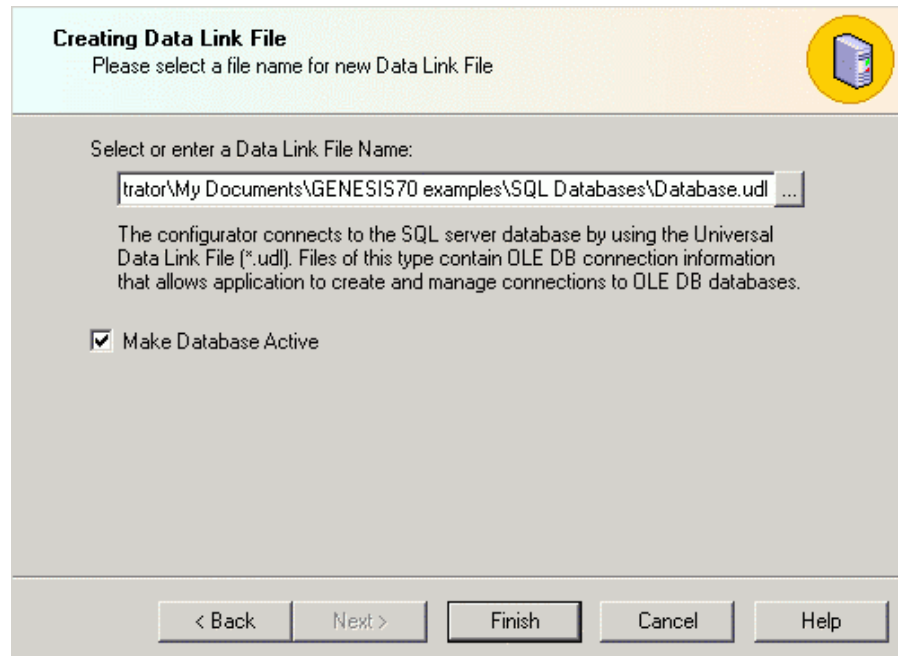
8. Under the **Database Properties** section, specify an initial size for the database, which should be as large as possible. You can also specify a **Database Growth** option (in megabytes) or as a percentage of the total size. MSDE servers are capable of growing the database on the fly to store more 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.

9. 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 Data Link File
Please select a file name for new Data Link File

Select or enter a Data Link File Name:

trator\My Documents\GENESIS70 examples\SQL Databases\Database.udl ...

The configurator connects to the SQL server database by using the Universal Data Link File (*.udl). Files of this type contain OLE DB connection information that allows application to create and manage connections to OLE DB databases.

☒ Make Database Active

< Back Next > Finish Cancel Help

Creating a Universal Data Link File

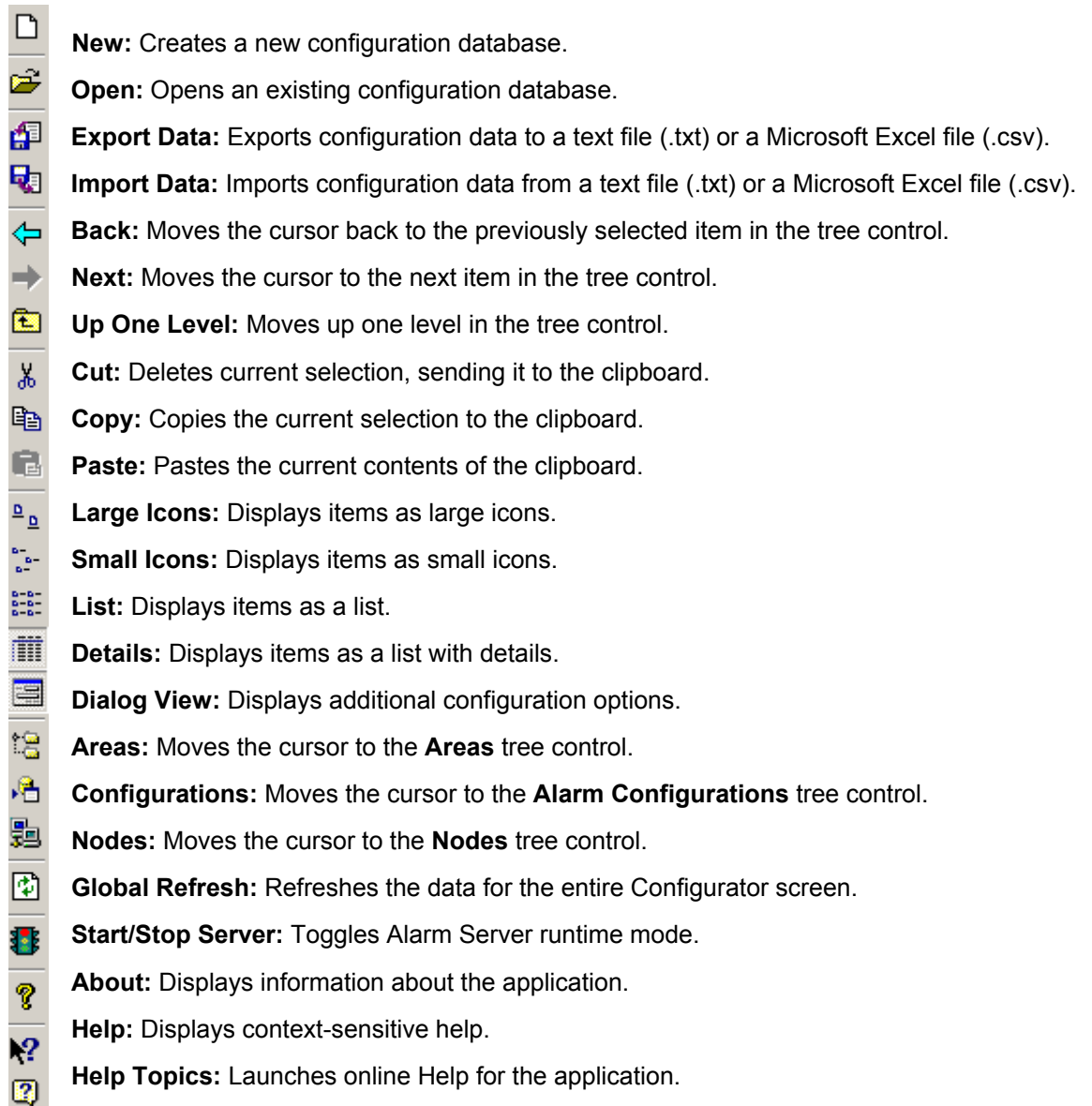
10. Click the **Finish** button. The new database is created and opened in the Configurator.

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.



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.

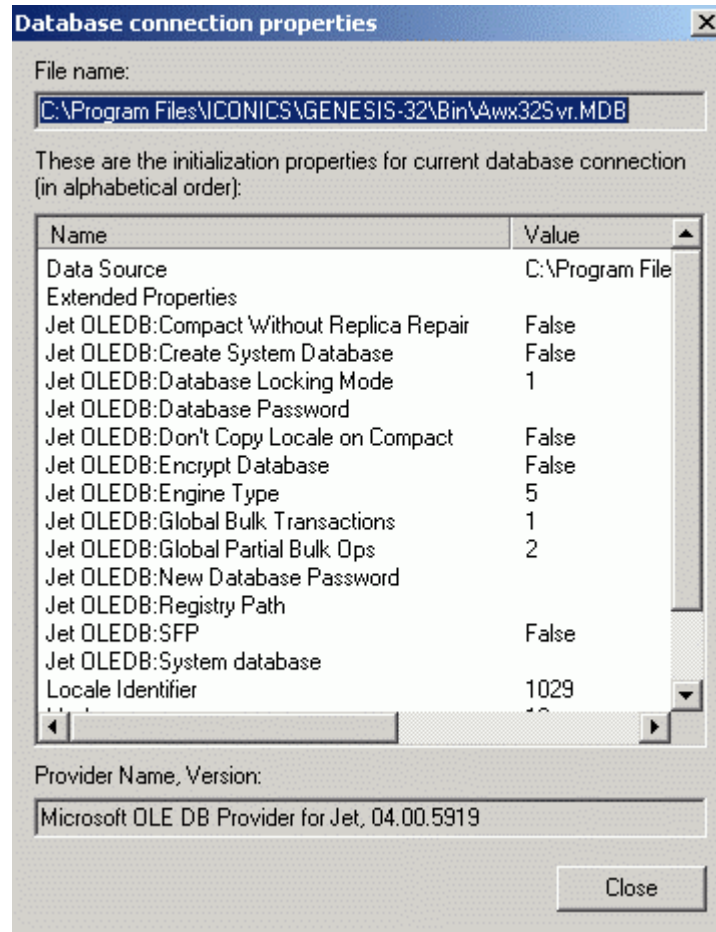
File Menu

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

Command	Shortcut Key	Function
New	CTRL+N	Creates a new configuration database.
Open	CTRL+O	Opens a Microsoft 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 under a different name as a Microsoft Access (.mdb) or Microsoft Data Link (.udl) file.
Connection Properties		Displays the current database connection properties.
CSV Export		Exports configuration data from your database to a text file (.txt) or a Microsoft Excel file (.csv). You can specify the delimiters and what to export.
CSV Import		Imports data into your configuration database from a text file (.txt) or a Microsoft Excel file (.csv). You can then specify the delimiters and choose from the import settings.
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 database and downloads the configuration to the server before data logging. If this command is not available, then the current database is already the active database.
Exit		Closes the application 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.

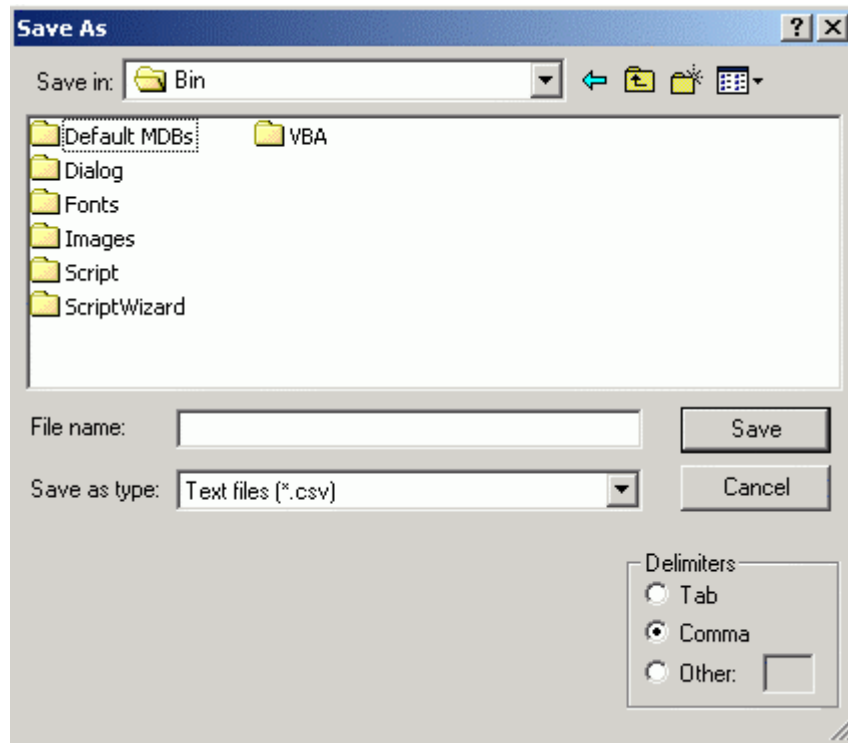


Database Connection Properties Dialog Box

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

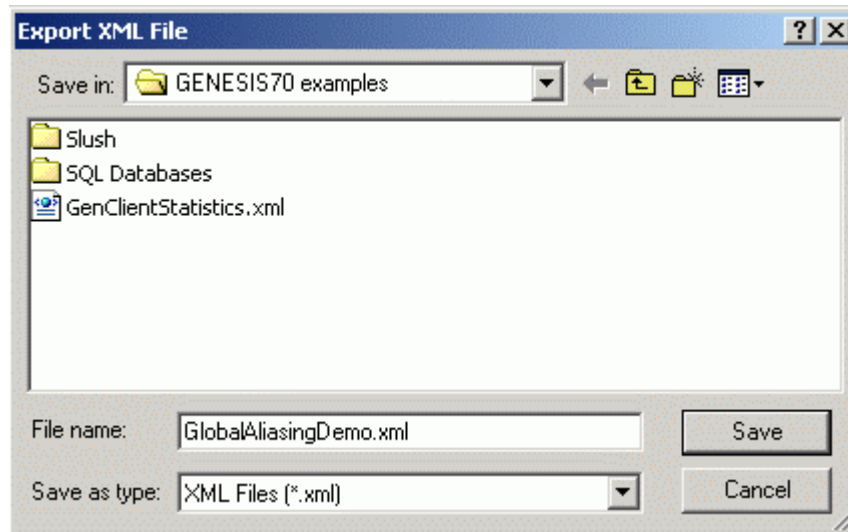
Exporting Data to an XML File

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

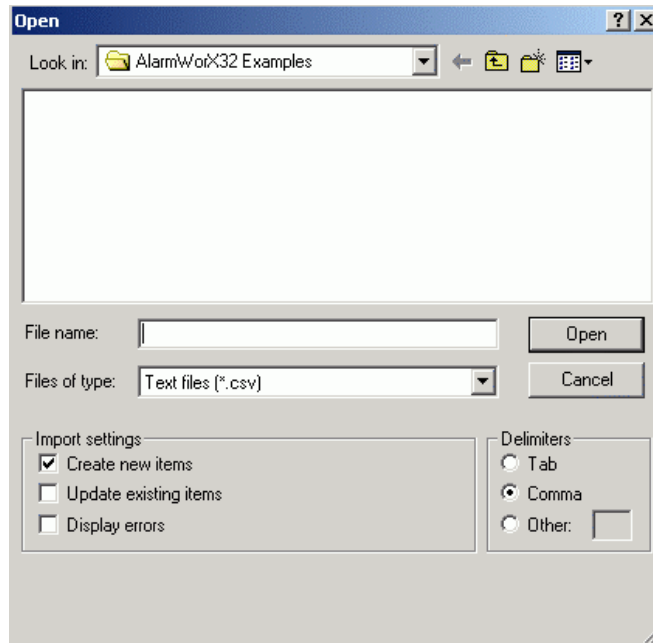
Importing Data From a Text or CSV File

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.

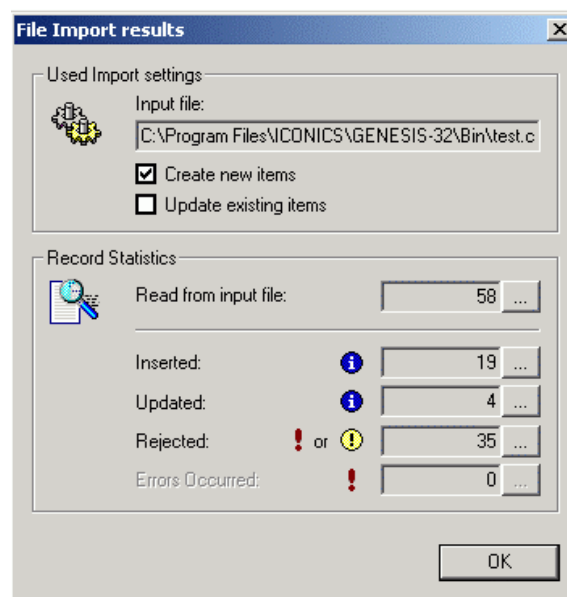
- **Display errors.** When this item is checked, the Configurator shows a dialog box if an error occurs, and then asks you if you want to proceed with the import. When it is not checked, it skips all items where an error occurred.



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:

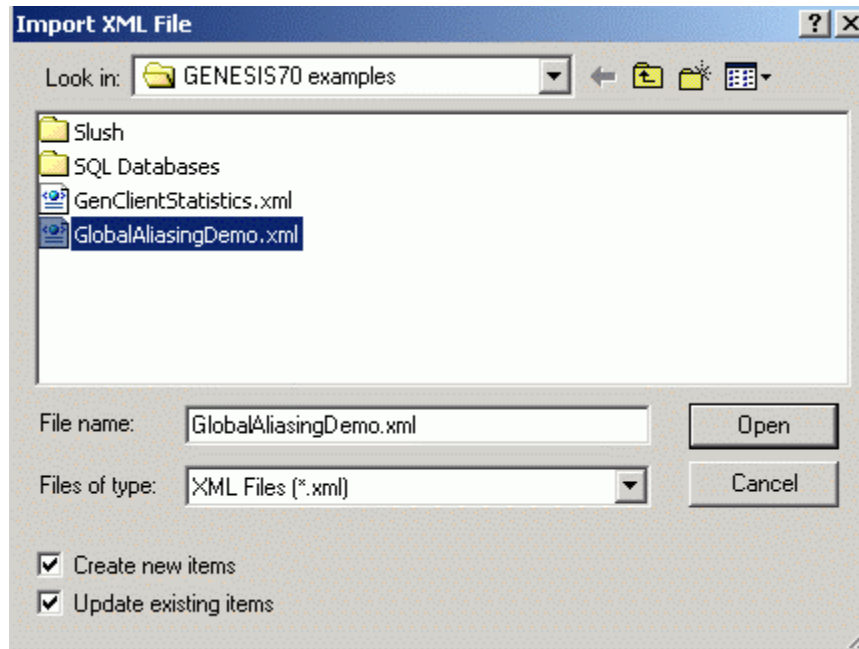
- XML has a standardized format, unlike the text/CSV format, which uses various delimiters (e.g. TAB instead of commas, strings could not accept all characters, etc.)
- XML is language-independent, whereas CSV converts date/time, floats, and currency fields according to local settings in Windows. For 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.

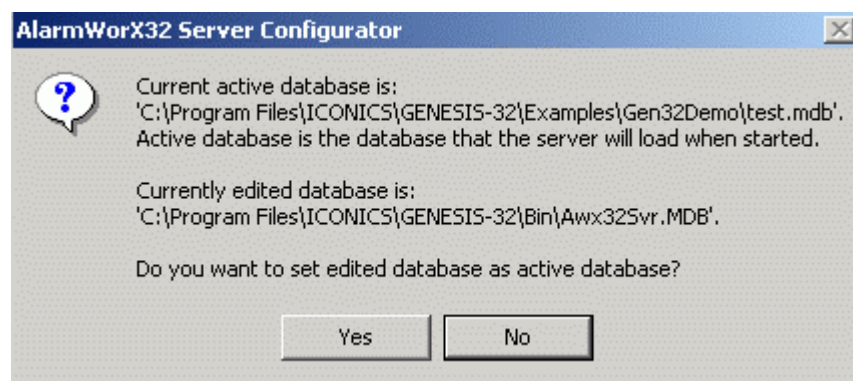


Importing Configuration Data From an XML File

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. 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.

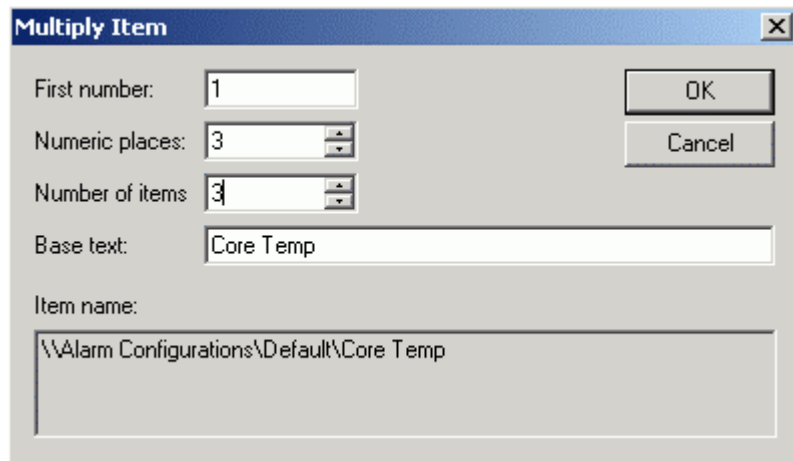
Edit Menu Commands

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	Multiplies the selected object in the tree control. (For more information on this command, see the section below.)
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

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 items 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.

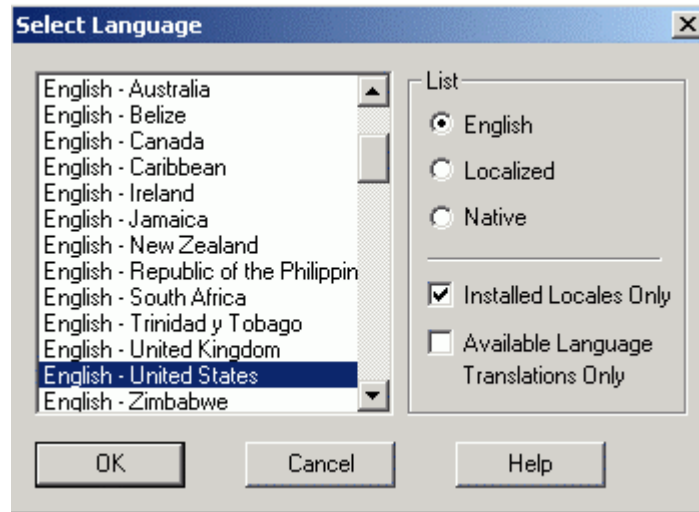
View Menu Commands

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.
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 commands are listed in the table below.

Command	Function
Start Alarm Server	Starts the alarm server for the active configuration.
Stop Alarm Server	Stops the alarm server for the active configuration.

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

Tools Menu

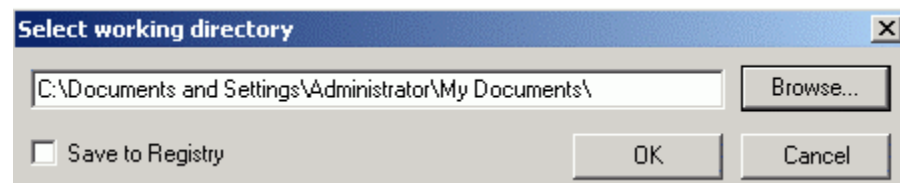
The **Tools** menu commands are listed in the table below.

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

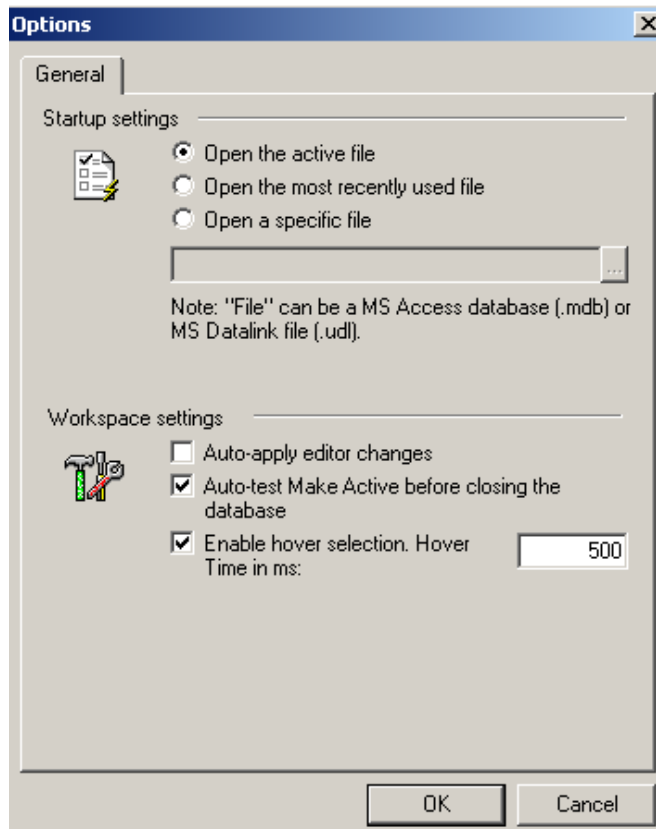
Selecting **Set Working Directory** from the **Tools** menu opens the **Set Working Directory** dialog box, shown below, which enables you to configure a custom directory in which all application configuration files will be stored and retrieved. Click **Browse** to select the directory.



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

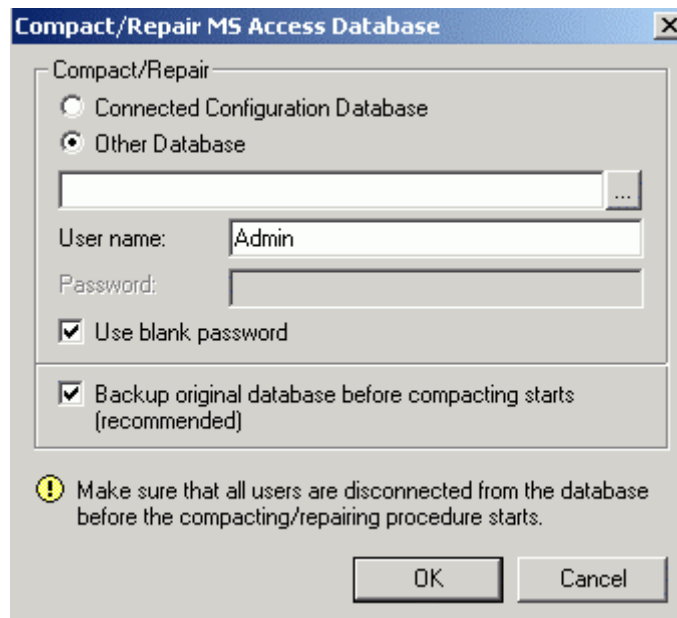
The following **Workspace Settings** are available:

- **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 Microsoft 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.



Compacting and Repairing Microsoft Access Databases

Help Menu

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

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

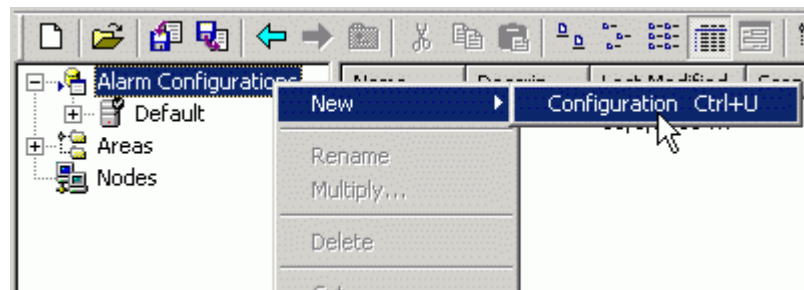
Alarm Configurations

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

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

Name: New Configuration 7/6/2004 2:16:20 PM

Description:

☐ Default Configuration

Runtime Settings

Scan Period: 1000 Milliseconds ☐ Use OPC DA Timestamp

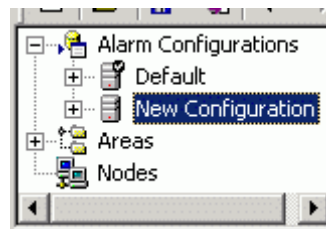
Startup squelch: 1 Minutes

GAS Theme:

Apply Reset Add New Configuration

Setting the Properties for the New Alarm Configuration

3. In the **Name** field, type a name for the new configuration.
4. 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.

Name: Default 6/22/2004 3:09:11 PM

Description:

☒ Default Configuration

Runtime Settings

Scan Period: 1200 Milliseconds ☐ Use OPC DA Timestamp

Startup squelch: 1 Minutes

GAS Theme:

Apply Reset Add New Configuration

Alarm Configuration Properties

Name: Type a name for the alarm configuration.

Description: Type 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.

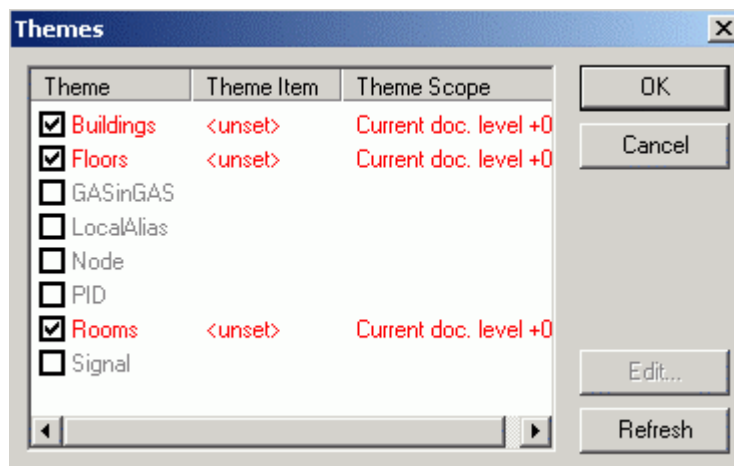
Scan Period: This is the requested update rate (period in milliseconds) sent to all OPC Data Access servers used by this configuration. The default is one second (1000 milliseconds).

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.

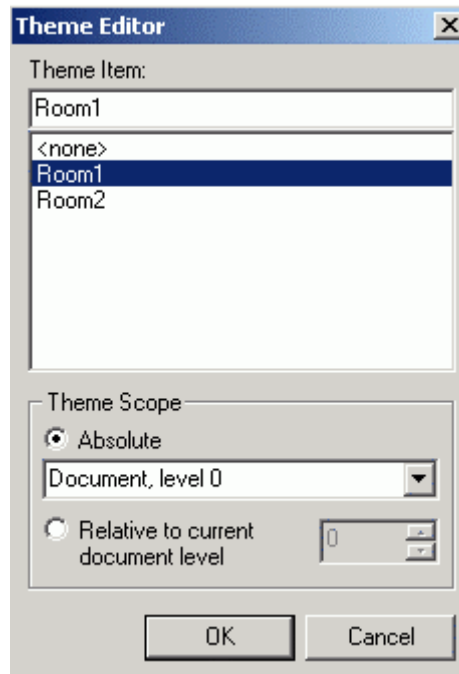
GAS Theme: Click the ... button to select a global aliasing theme from the **Themes** dialog box, as shown in the figure below.



Choosing a Global Alias Start Theme

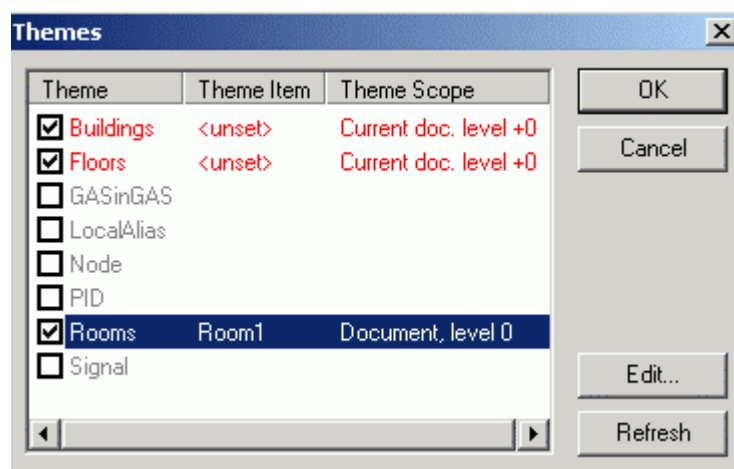
To define the theme scope, highlight a theme and click the **Edit** button. This opens the **Theme Editor** dialog box, as shown in the figure below. Select a

Theme Item (e.g. "Room1") to associate with the start theme. Under **Theme Scope**, you can specify an **Absolute** theme scope (e.g. machine level, process level, or document level). Alternatively, you can specify a scope for the theme that is **relative to the current document level** (e.g. main display, pop-up window 1, pop-up window 2, etc.). Click **OK**.



Specifying the Theme Item and Scope

The selected **Theme Item** and **Theme Scope** are now indicated in the **Themes** dialog, as shown in the figure below. Click **OK**. For more information about global aliasing themes, please refer to the Global Aliasing Configurator help documentation.



Theme Scope Indicated

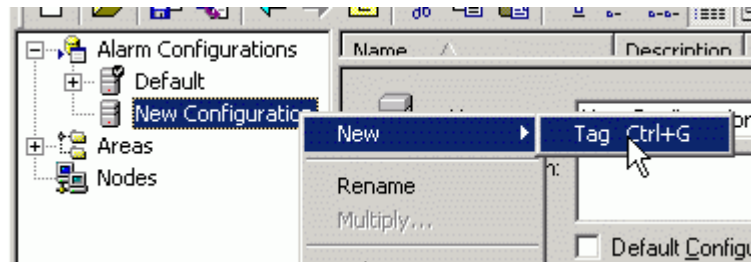
Tags

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

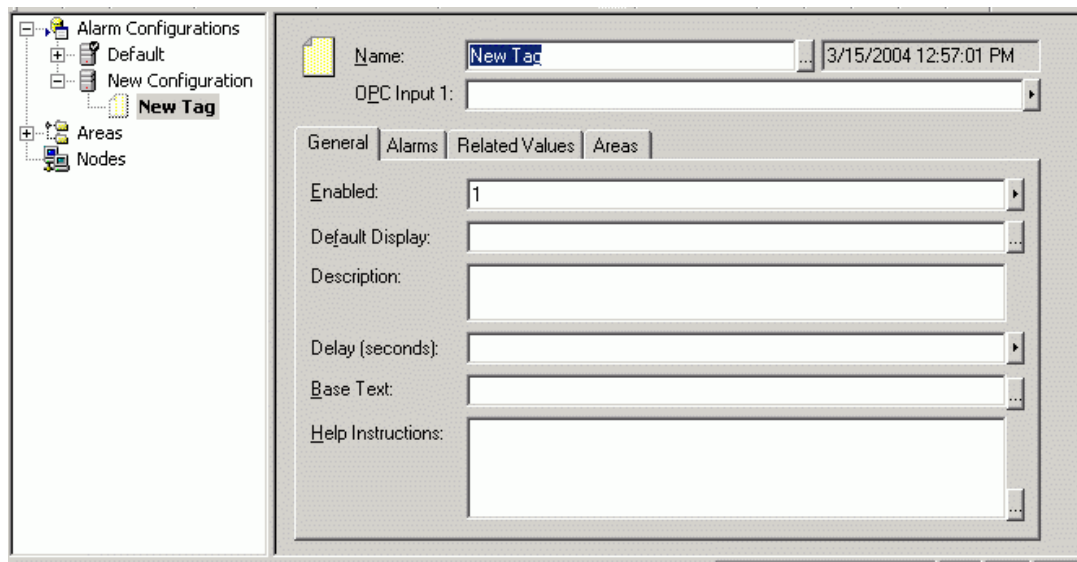
To create a new tag:

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

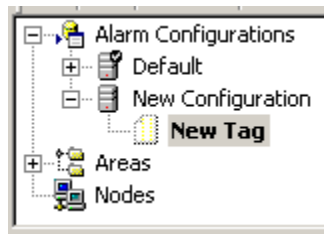
2. The properties dialog box for the new tag appears in the right-hand pane of the Configurator, as shown in the figure below.



Setting the Properties for the New Tag

3. In the **Name** field, type a name for the new tag.
4. 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.

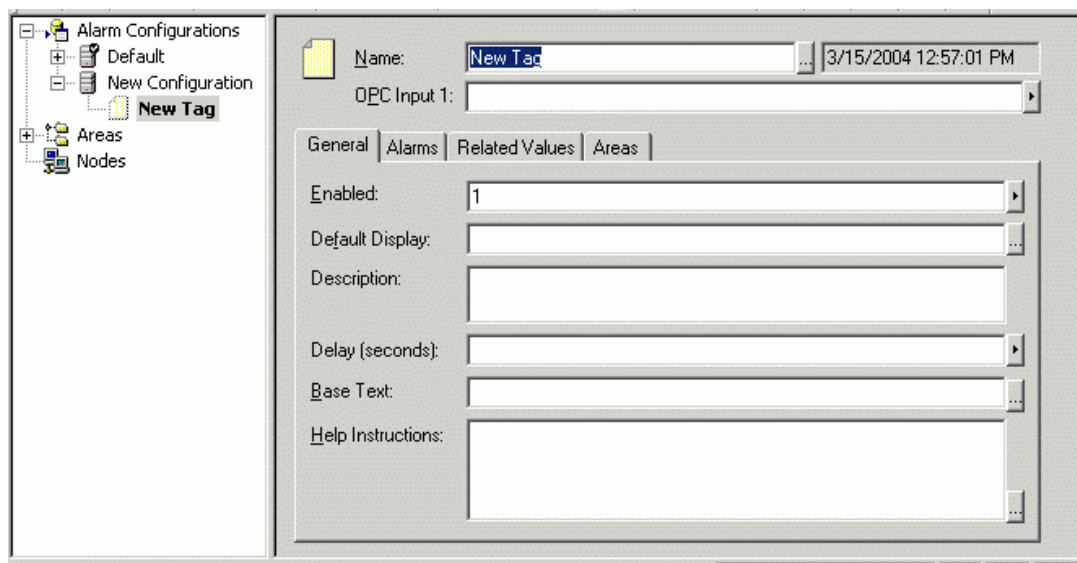
5. When you have finished configuring the tag properties, click the **Apply** button. The new tag appears under the **Alarm Configurations** tree control, as shown in the figure below.



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

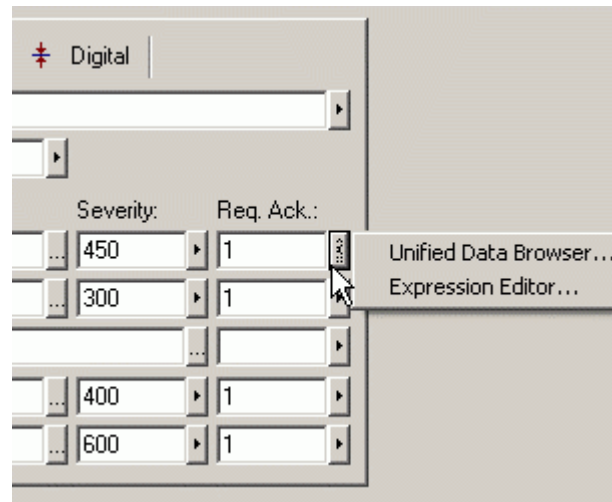
Name: Type a name for the tag. The alarm's tag name uniquely identifies the alarm.

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**

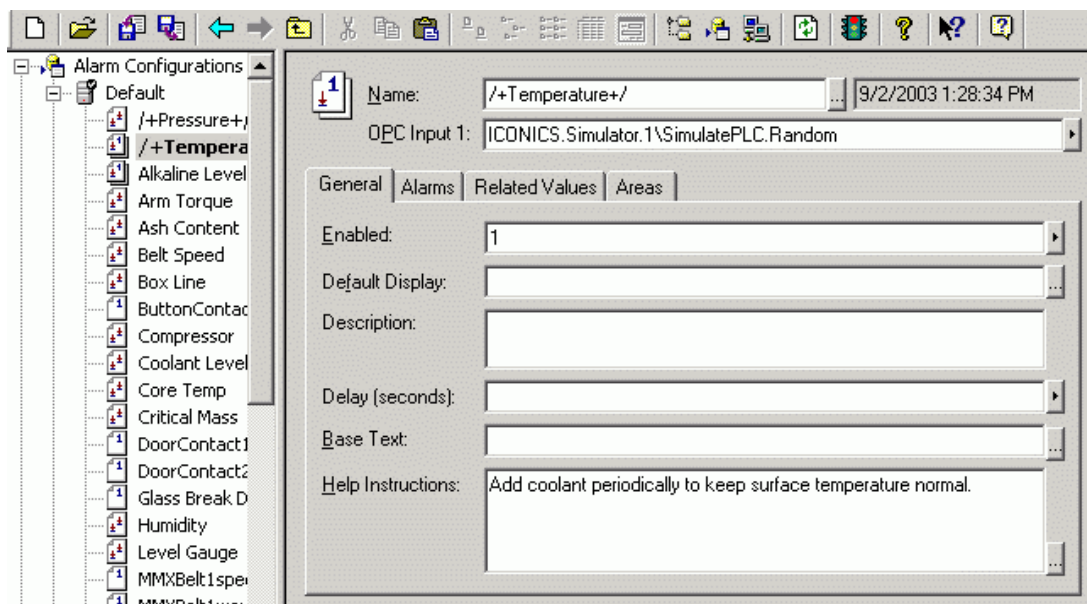
Throughout the tag properties sections, you can choose OPC tags and expressions for the various fields by clicking on the arrow buttons, as shown in the figure below.



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 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.

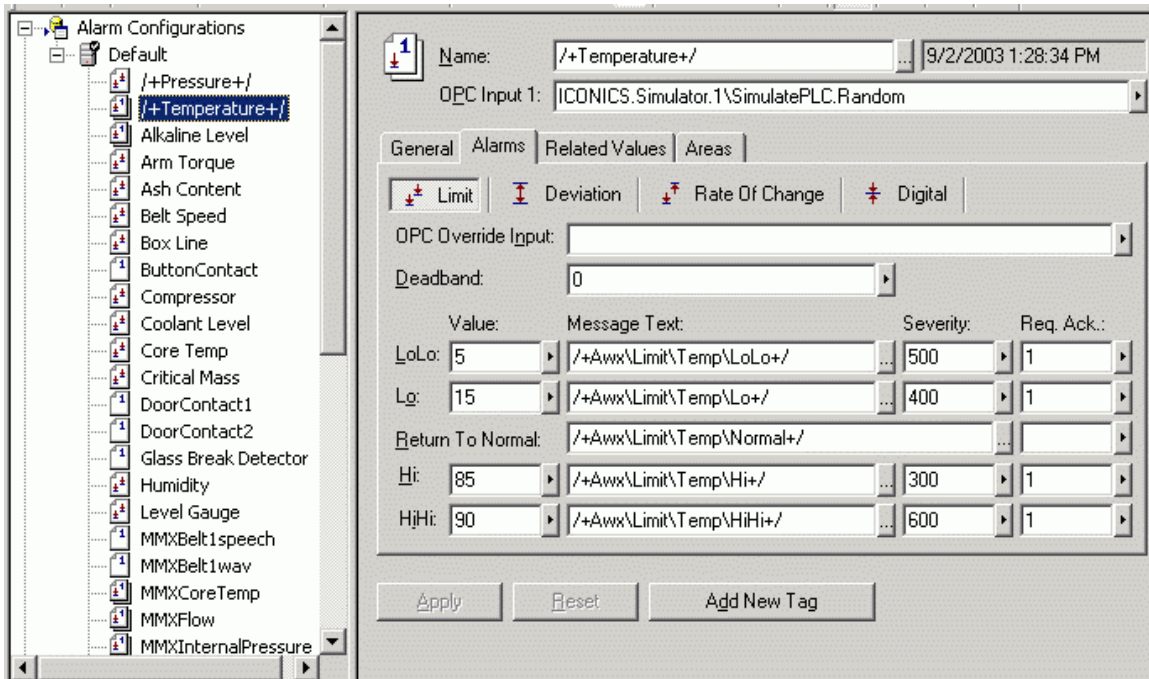
Clicking the ... button in the **Help Instructions** and **Base Text** fields opens the **Language Aliases** tab of the **Unified Browser**, which includes all language aliases in the language database. This eliminates the need to manually type in the alias name. Clicking the ... button opens the language alias browser. The browser includes all languages aliases in the language configuration 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.

Alarms

The **Alarms** section of the tags properties, shown in the figure below, 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.



Tags: Alarm Properties

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**.

The screenshot shows the 'Limit' tab of the 'Alarms' section in a software interface. The 'Name' field is set to '/+Temperature+/' and the 'OPC Input 1' field is set to 'ICONICS.Simulator.1\SimulatePLC.Random'. The 'Limit' tab is selected, showing fields for 'OPC Override Input', 'Deadband', and four alarm levels: 'LoLo', 'Lo', 'Hi', and 'HiHi'. Each level has a 'Value' field, a 'Message Text' field, a 'Severity' field, and a 'Req. Ack.' field.

Value:	Message Text:	Severity:	Req. Ack.:
LoLo: 5	/+Awx\Limit\Temp\LoLo+/ ...	500	1
Lo: 15	/+Awx\Limit\Temp\Lo+/ ...	400	1
Return To Normal: /+Awx\Limit\Temp\Normal+/ ...			
Hi: 85	/+Awx\Limit\Temp\Hi+/ ...	300	1
HiHi: 90	/+Awx\Limit\Temp\HiHi+/ ...	600	1

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 Aliases** tab of the **Unified Browser**, which includes all language aliases in the language database. This

eliminates the need to manually type in the alias name. Clicking the ... button opens the language alias browser. The browser includes all languages aliases in the language configuration 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.

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.

The screenshot shows the 'Alarm Types: Deviation Tab' configuration window. At the top, the 'Name' field is set to '/+Temperature+/' and the date/time is '9/2/2003 1:28:34 PM'. Below this, 'OPC Input 1' is set to 'ICONICS.Simulator.1\SimulatePLC.Random'. The 'General' tab is selected, and within it, the 'Deviation' sub-tab is active. This sub-tab has four radio buttons: 'Limit', 'Deviation' (selected), 'Rate Of Change', and 'Digital'. Below these, 'OPC Input 2' is set to '50' and 'Deadband' is set to '0'. A table at the bottom defines alarm limits with columns for 'Value', 'Message Text', 'Severity', and 'Req. Ack.'.

Value	Message Text	Severity	Req. Ack.
LoLo: 2	/+Awx\Deviation\Temp\LoLo+/ ...	450	1
Lo: 5	/+Awx\Deviation\Temp\Lo+/ ...	230	1
Return To Normal:	/+Awx\Deviation\Temp\Normal+/ ...		
Hi: 7	/+Awx\Deviation\Temp\Hi+/ ...	500	1
HiHi: 10	/+Awx\Deviation\Temp\HiHi+/ ...	700	1

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 Aliases** tab of the **Unified Browser**, which includes all language aliases in the language database. This eliminates the need to manually type in the alias name. Clicking the ... button opens the language alias browser. The browser includes all languages aliases in the language configuration 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.

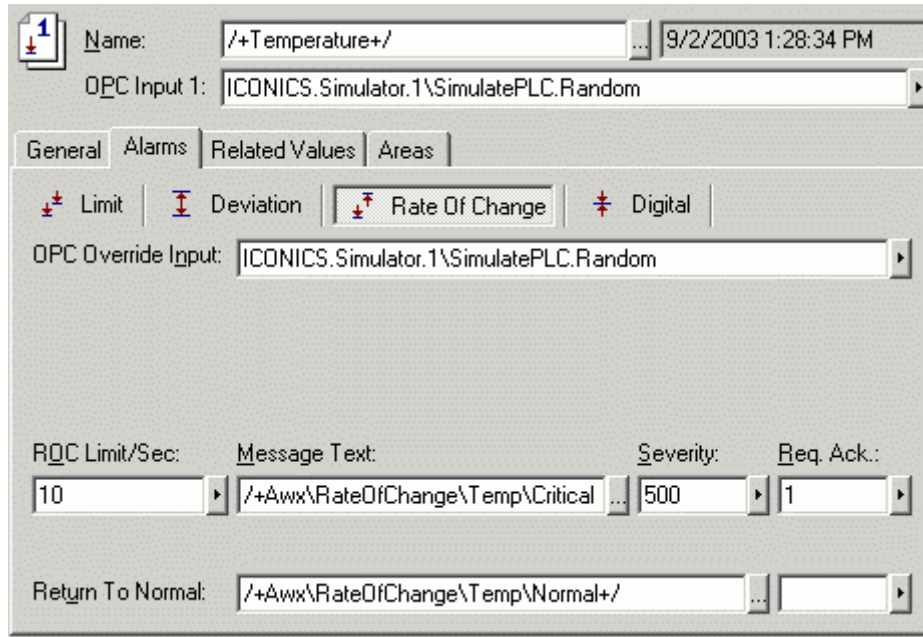
Severity is the OPC-defined value for alarm Priority. The valid OPC severity range is 0 (lowest) to 1000 (highest).

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.



1 Name: 9/2/2003 1:28:34 PM

OPC Input 1:

General Alarms Related Values Areas

☐ Limit ☐ Deviation ☒ Rate Of Change ☐ Digital

OPC Override Input:

RQC Limit/Sec: Message Text: Severity: Req. Ack.:

Return To Normal:

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 Aliases** tab of the **Unified Browser**, which includes all language aliases in the language database. This eliminates the need to manually type in the alias name. Clicking the ... button opens the language alias browser. The browser includes all languages aliases in the language configuration 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.

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.

The screenshot shows a software window titled '1' with a timestamp '9/2/2003 1:28:34 PM'. The 'Name' field contains '/+Temperature+/' and the 'OPC Input 1' field contains 'ICONICS.Simulator.1\SimulatePLC.Random'. Below these are tabs for 'General', 'Alarms', 'Related Values', and 'Areas'. The 'Alarms' tab is active, showing sub-tabs for 'Limit', 'Deviation', 'Rate Of Change', and 'Digital'. The 'Digital' sub-tab is selected. It features an 'OPC Override Input' field. Below this are four fields: 'Alarm State Value' (empty), 'Message Text' (empty), 'Severity' (set to '500'), and 'Req. Ack.' (set to '1'). At the bottom is a 'Return To Normal' field (empty).

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 Aliases** tab of the **Unified Browser**, which includes all language aliases in the language database. This eliminates the need to manually type in the alias name. Clicking the ... button opens the language alias browser. The browser includes all languages aliases in the language configuration 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.

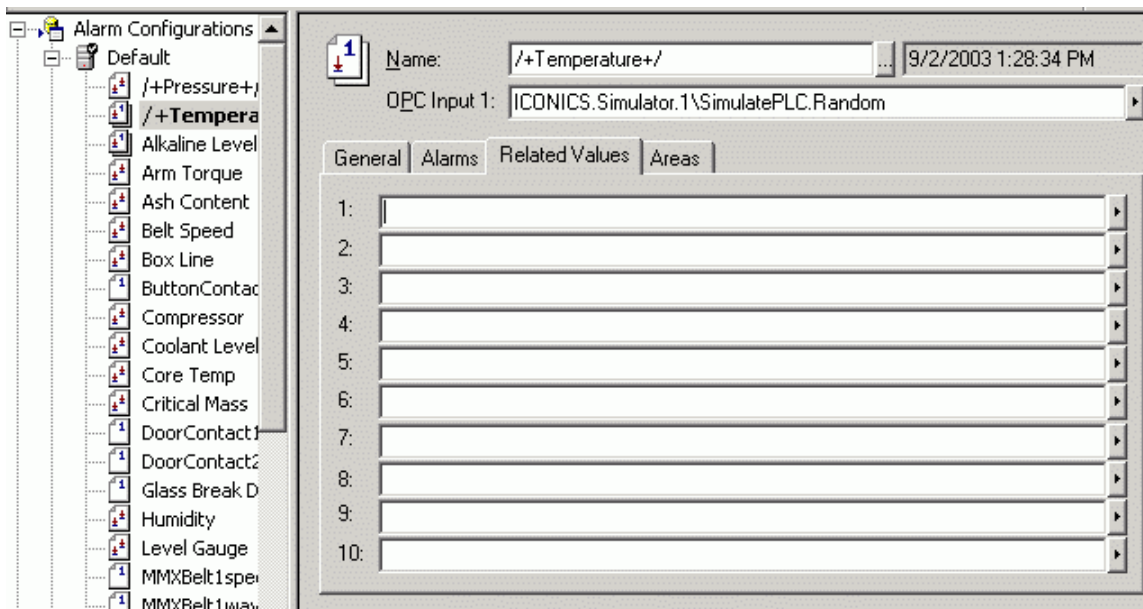
Severity is the OPC-defined value for alarm Priority. The valid OPC severity range is 0 (lowest) to 1000 (highest).

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.

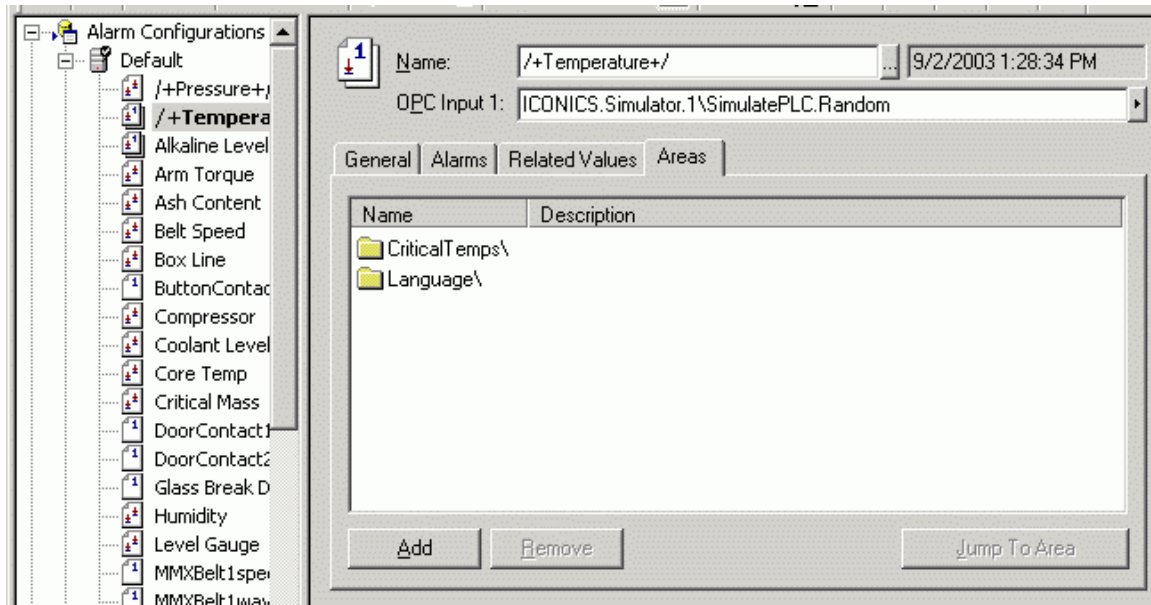
The **Related Values** section of the tags properties, shown in the figure below, allows you to associate up to 10 OPC tags or expressions with each alarm tag as "supplemental" information to the alarm. For example, you could relate a "Batch ID" to a specific alarm. Then, when the alarm becomes active, 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

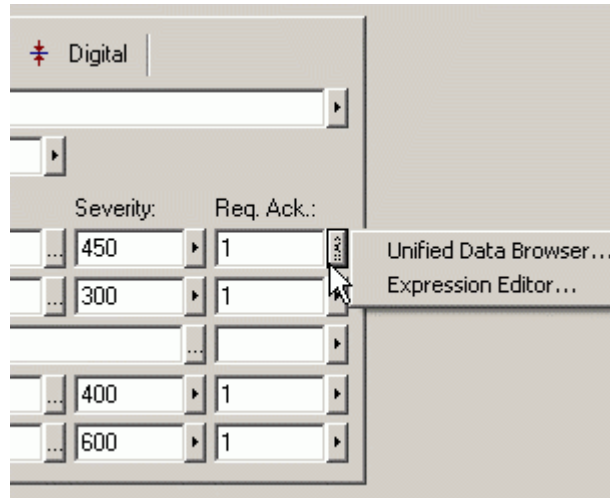
The **Areas** section of the tags properties, shown in the figure below, shows all areas to which the tag is linked. Clicking on an area takes you to the area configuration. You can assign an alarm to more than one area or grouping. For example, a tank limit alarm may be part of both the "Tank 1" area, 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

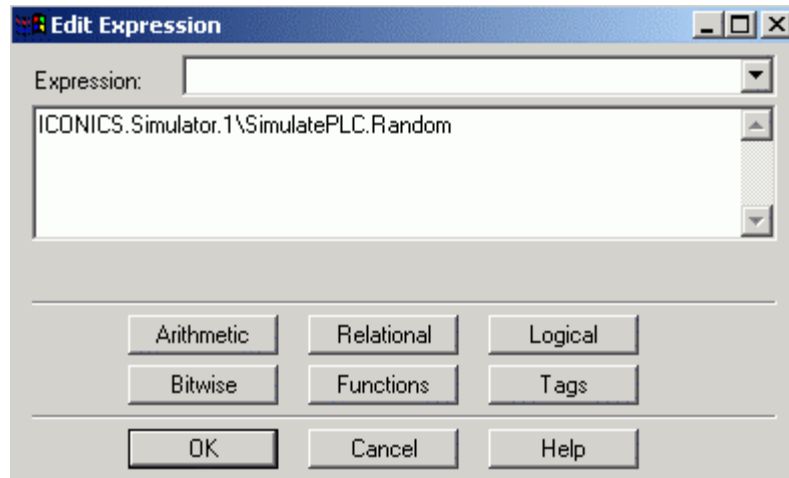
OPC Tags

Selecting **Unified Data Browser** opens the Unified Data Browser. In the browser, click on the **OPC DA** tab to select OPC Data Access tags.

Expression Editor

Selecting **Expression Editor** opens the **Edit Expression** dialog, as shown in the figure below. The Expression Editor, shown below, is available to assist you in creating expressions for your GENESIS32 applications. The window is resizable and can be stretched as well as maximized or minimized. The drop-down list at the top of the **Edit Expression** dialog box keeps track of the last 50 expressions you have entered. The expression entered most recently is the first one in the drop-down list.

Note: For more information about the Expression Editor, please see the Expression Editor help documentation.



Expression Editor

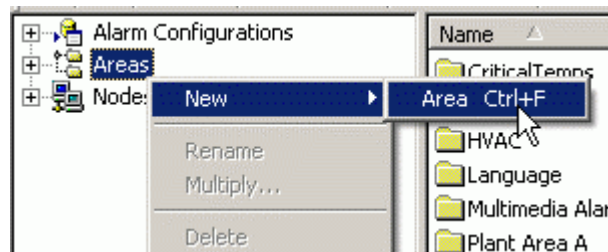
Areas

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. 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.

Creating a New Area

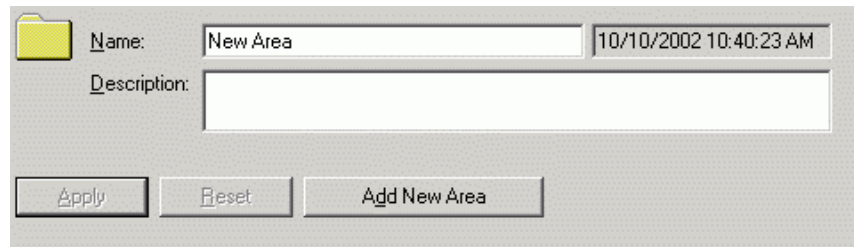
To create a new area:

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.



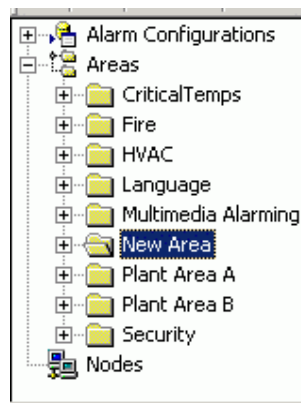
Creating a New Area

2. 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

3. In the **Name** field, type a name for the new area. You can optionally type a **Description** for the area.
4. 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.

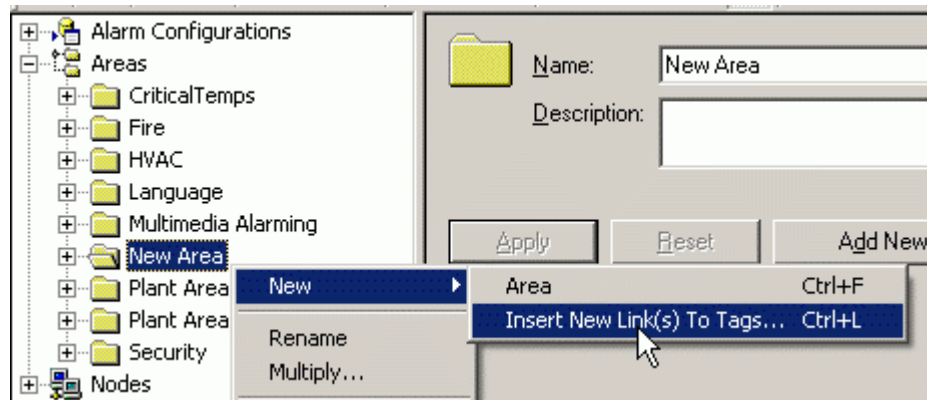


New Area Added to Tree Control

Linking to Alarm Tags

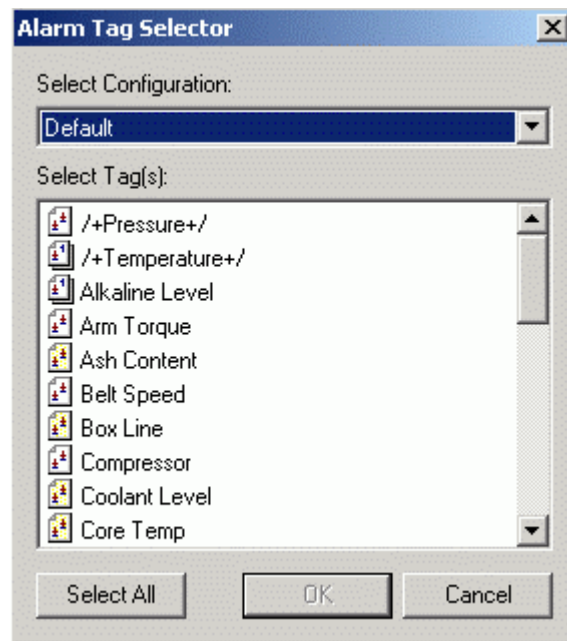
To create a new link to alarm tags from a particular area:

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.



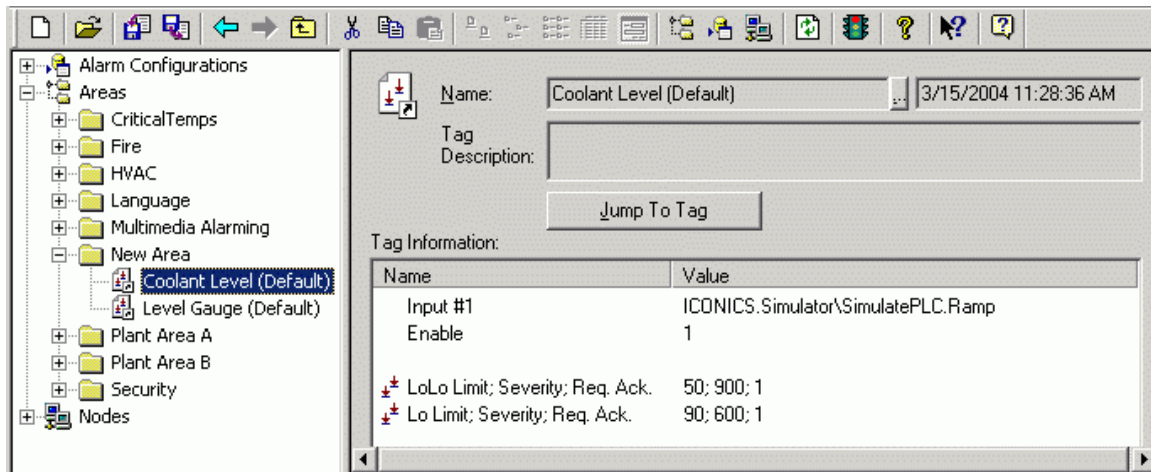
Creating an Alarm Tag Link

2. 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

3. 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

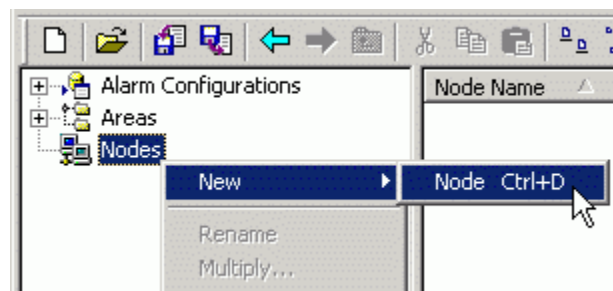
Nodes

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

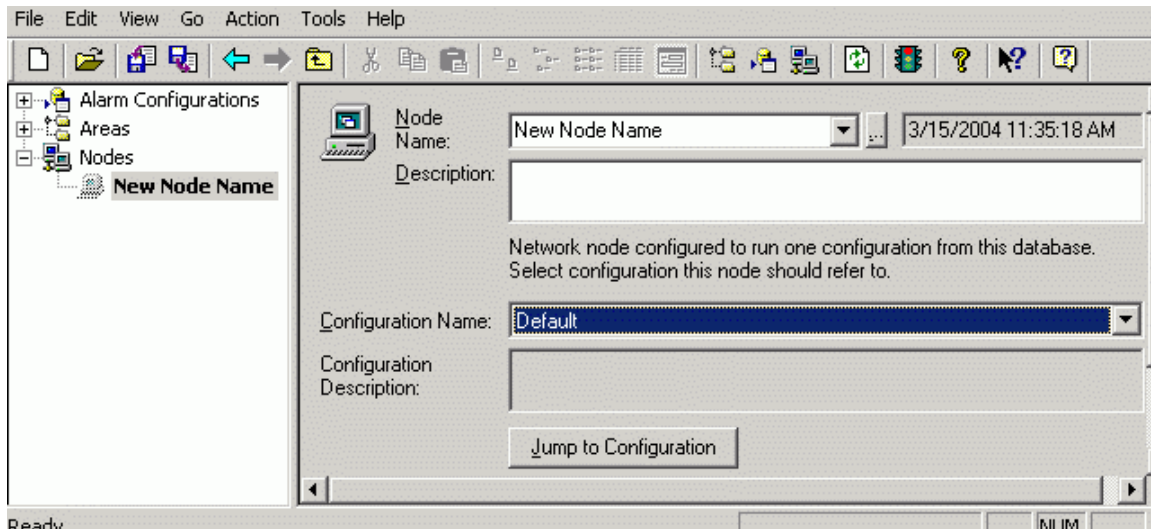
To add a new node to the configuration:

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

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 **Node Name** field, type a name for the new node. You can optionally type a **Description** for the node.
4. 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**.
5. When you have finished configuring the node, click the **Apply** button. The new area appears under the **Nodes** tree control.

Alarm Server Runtime Operations

This section describes the following runtime aspects of the AlarmWorX32 Server:

- Startup
- OPC Alarm and Events Interface
- OPC Data Access Interface
- Error Reporting

Starting the Alarm Server

The AlarmWorX32 Server may be launched in one of four ways:

- Automatically on boot if it is installed as a service.
- By selecting **Start Alarm Server** from the **Action** menu of the Alarm Server Configurator.
- When an OPC Alarm and Events client creates a connection to the alarm server.
- Through GenTray.

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 opens the active configuration database and queries 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 shut down and restarted.

OPC Alarm and Events Interface

The AlarmWorX32 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 subconditions:

- 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 AlarmWorX32 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 GraphWorX32, 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 are 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_RTNTText	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	

Item Name	Type	R/W	Comment
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_RTNTText	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	
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_RTNTText	VT_R8	R	
DIG_Input2	VT_R8	R	
DIG_Active	VT_BOOL	R	

Item Name	Type	R/W	Comment
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_RTNTText	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 AlarmWorX32 Sever are reported via the GENESIS32 Event Server, another OPC Alarm & Events compliant server. The GENESIS32 Event Server can optionally write selected events to the NT Event Log. The following simple events may be generated by the AlarmWorX32 Server: For the GENESIS32 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"

TraceWorX32 Support

Using a technology that has been incorporated into all GENESIS32 products, **TraceWorX32** provides online diagnostics and tuning of applications running in the GENESIS32 system. TraceWorX32 is designed expressly for systems integrators, OEMs and customers who want to have tools for doing their own troubleshooting and diagnostics. TraceWorX32 tracks the runtime activity for each GENESIS32 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 TraceWorX32, please see the TraceWorX32 Help documentation.