



## iFIX 6.1

### Implementing Alarms and Messages

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# Implementing Alarms and Messages

Implementing Alarms and Messages is intended for process engineers who design, configure, and maintain the iFIX® alarm system. This manual provides engineers with suggestions for implementing alarms and teaches them the skills they need to enable alarms in the process database, create alarm areas, and configure alarm destinations. It also provides instructions on displaying alarms in pictures, acknowledging alarms, and optimizing performance.

## Reference Documents

For related information about iFIX, refer to the following manuals:

- [Understanding iFIX](#)
- [Setting up the Environment](#)
- [Building a SCADA System](#)
- [Creating Pictures](#)
- [Creating Recipes](#)

## Introduction

As your plant runs, process conditions change constantly. Your operators need to monitor these conditions to ensure that your plant runs safely, and does not waste material or damage equipment.

You can safely and efficiently manage your plant by enabling the iFIX® alarm system. Once you enable alarming, iFIX sends *alarms* to report potentially harmful process conditions requiring a response. Typically, this happens when process values exceed their pre-defined limits. For example, a tank's fluid level that is too high is an alarm condition to which an operator must respond.

iFIX also sends *messages* to report non-critical information that does not require a response. For example, when a tank's input valve opens or closes, iFIX sends a message to the operator that the valve's state has changed. iFIX sends messages to inform you when:

- An operator inputs a value.
- A process database event occurs.
- A system-level event occurs, such as when iFIX completes its start-up sequence.

Using alarms and messages, you can create a reliable, flexible, and easy-to-use system that reports potential problems and system activity. As operators respond to alarms, they ensure your process runs in a safe and efficient manner. For example, by responding to an alarm that a tank's level is too low, operators can save you money that you would have to spend replacing damaged equipment if the level was not adjusted.

## Understanding Alarms and Messages

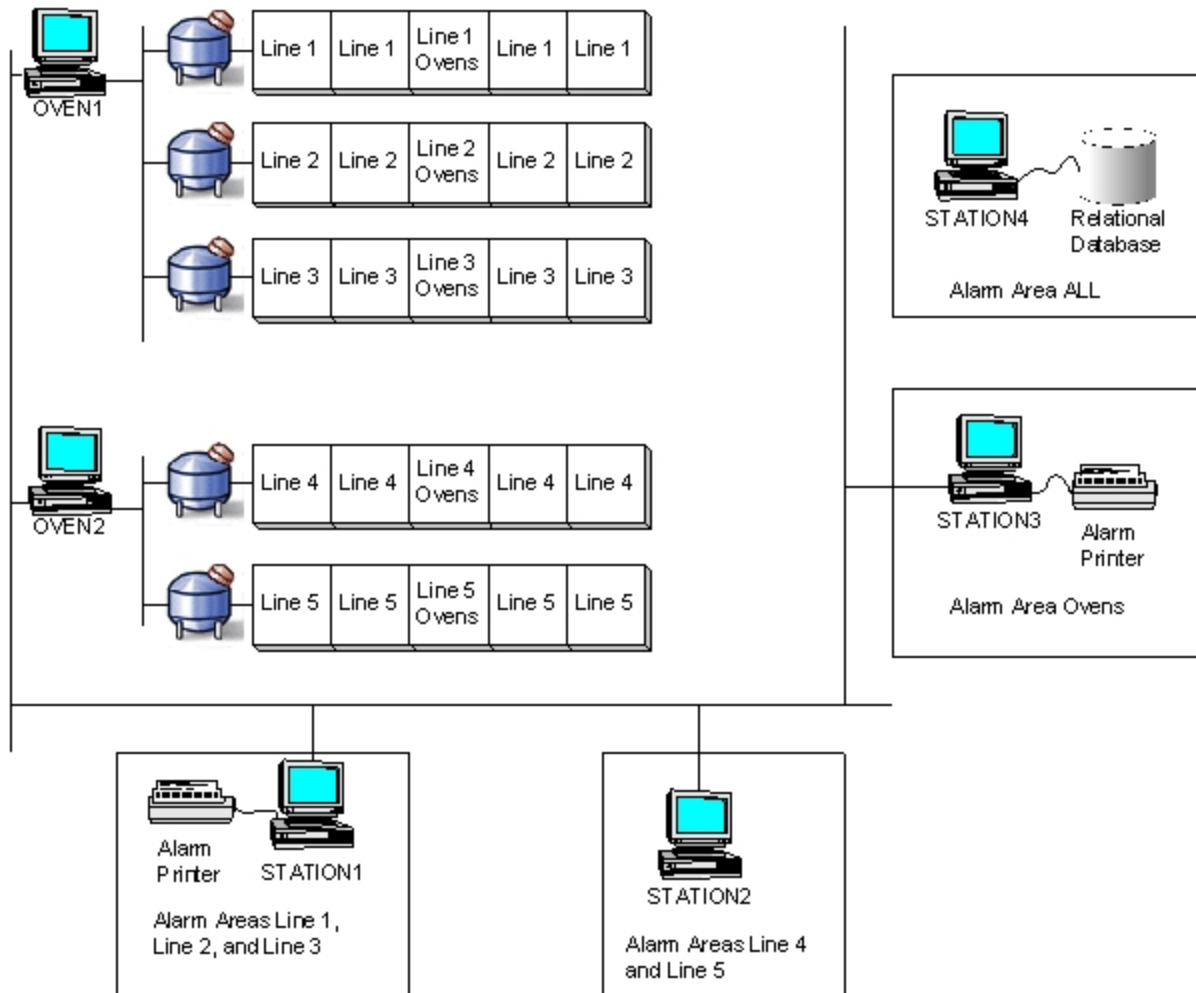
Before you can use the iFIX alarm system, you should understand more about alarms and messages. The following sections explain important alarm concepts.

### Alarm Destinations

An *alarm destination* is an alarm service enabled in the System Configuration Utility (SCU). You can enable one or more alarm destinations on any iFIX node you set up. Once you enable an alarm service, iFIX starts a task to provide that service. For example, when you enable the Alarm Printer Service, iFIX starts a task to print the alarms and messages.

### Alarm Areas

An *alarm area* is a physical or functional division of your plant. Once you enable an alarm destination, you assign alarm areas to it. In the following figure, OVEN1 has database blocks in alarm areas Line 1, Line 2, and Line 3 and OVEN2 has database blocks in alarm areas Line 4 and Line 5. These are physical divisions and correspond to individual production lines.



*Sample Alarm Areas*

Alarm area Ovens, on the other hand, is a functional division. It corresponds to an oven temperature. Operators monitor the temperature separately because it is critical to the overall process.

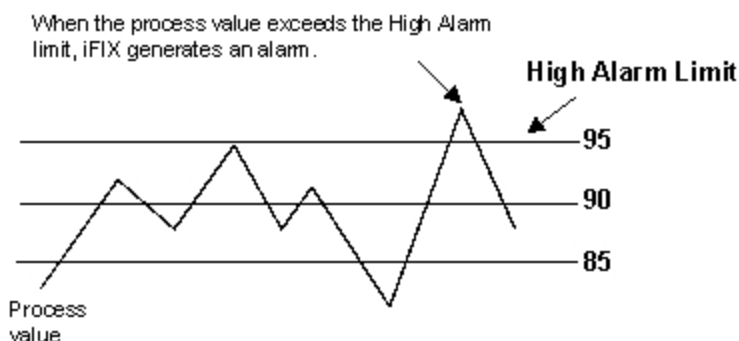
### **Routing Alarms and Messages**

iFIX can route alarms and messages after you assign alarm areas to database blocks and alarm destinations. The area name acts as a routing label between the database blocks and alarm destinations in the same alarm area.

You can create any alarm area by naming it. iFIX saves these names in an *alarm area database*. Each iFIX SCADA server can have its own custom alarm area database. However, this approach makes troubleshooting more difficult. A better approach is to share the database by copying it to a file server. For more information on designing alarm areas, refer to the chapter [Implementing an Alarm Strategy](#).

### **Alarm Limits and Alarm Conditions**

In order for iFIX to determine if an analog process value is in alarm, you must enter pre-defined values, called *alarm limits*, that you do not want the block to exceed. Should a block exceed one of these limits, iFIX generates an alarm, as the following figure shows.



## Digital Alarm Limits

For digital blocks, you can specify alarm conditions, not alarm limits. An *alarm condition* indicates when you want a digital block to generate an alarm. For example, if you set up a block to monitor a motor that is ON, you can configure the block to generate an alarm when the motor changes to a different state or when it switches OFF.

## Alarm Priority

In addition to alarm limits, you can select an *alarm priority* for your database blocks. This priority ranges from INFO, LOLO, LOW, MEDIUM, HIGH, HIHI, to CRITICAL. The priority indicates the importance of a block's alarms. Typically, you assign the priority of your most critical blocks to CRITICAL. This distinguishes the highest priority alarms from less-critical ones. You can also filter your alarms based on their priority so that operators see only the alarms you want displayed, as the following section explains.

For more enhanced alarm prioritization, consider using the Analog Alarm block. This block lets you assign one priority to each alarm type that the block generates instead of one priority for all alarms. Consequently, you can easily filter out specific alarms coming from the block. For more information on the Analog Alarm block, refer to the [iFIX Database Reference](#).

## Filtering Alarms

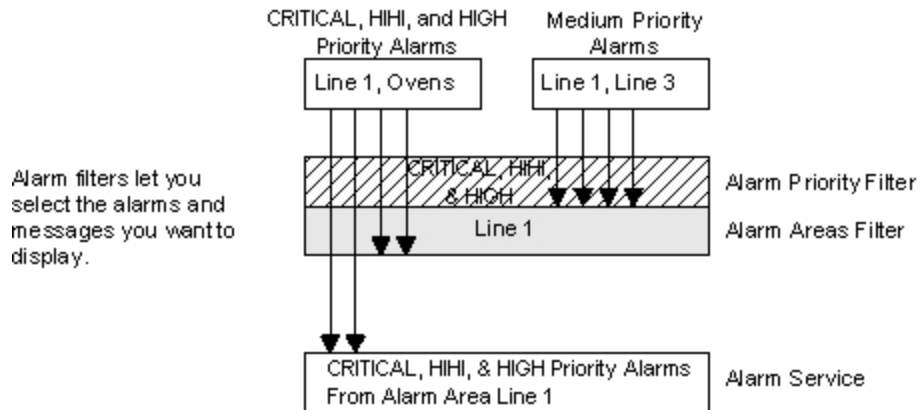
SCADA servers also have an alarm priority that acts as a filter, as the following table describes.

If a block's alarm priority is...	Then iFIX...
More severe or equal to the SCADA server's alarm priority	Distributes the alarm to the enabled alarm destinations.
Less severe than the SCADA server's alarm priority	Filters out the alarm and does not distribute it to the enabled alarm destinations.

## Filtering Alarms by Alarm Area

Alarm areas also act as a filter for alarms and messages. For example, using the configuration in the [Sample Alarm Areas](#) figure, STATION3 only receives alarms and messages from alarm area Ovens. iFIX filters out the alarms and messages from all other alarm areas.

To allow greater flexibility, you can also apply both filters simultaneously, as the following figure shows. This figure filters out the CRITICAL, HIHI, and HIGH alarms to the alarm service.



*Using the Alarm Priority and Alarm Area Filters*

## Understanding Message Types

In addition to alarms, iFIX sends the following types of messages to alarm destinations:

**Event Messages** - record events occurring in your process database.

**Application Messages** - describe database-related activity generated by an iFIX application or entered by an operator.

**System Messages** - provide information about errors, system alert messages, and system-level events, such as when a task completes.

For more information on each message type, refer to the chapter [Configuring Messages](#).

## Using Alarms and Messages

iFIX provides many methods for receiving and displaying alarms. These methods include:

- Coloring an object based on alarm.
- Triggering a script to run when an alarm occurs.
- Viewing the alarms and messages received in real-time with the Alarm Summary object.
- Recording, storing, and retrieving alarms and messages for subsequent analysis or historical reference.

The following sections describe each of these functions.

### Coloring an Object

iFIX enables you to create easy-to-use pictures and visual cues for operators about new alarm conditions. Typically, you provide such cues by changing the color of an object when an alarm occurs. By coloring an object, you notify operators of the alarm so they can respond to it.

For more information on adding visual cues to your pictures, refer to the chapter [Displaying Alarms in Pictures](#).

## Triggering a Script

A script that runs when an alarm occurs is another way to notify operators. Using the Scheduler, you can configure an event-based schedule that runs a script when a specific type of alarm occurs. The script you create can respond in any way you consider appropriate.

For example, it could open a picture or launch a custom application. For more information on triggering scripts based on an alarm, refer to the [Mastering iFIX](#) manual.

## Creating Pictures with the Alarm Summary Object

Creating a picture that contains an Alarm Summary object is an effective way to notify operators of new alarms because the object lets operators see and respond to the alarms that the computer receives. The Alarm Summary object also provides powerful tools for filtering, sorting, coloring, acknowledging, deleting, and pausing alarms.

For example, you might color CRITICAL, HIHI, and HIGH priority alarms red, MEDIUM priority alarms green, and LOW, LOLO, and INFO priority alarms blue. This method provides recognizable visual cues for your operators, enabling them to easily determine the alarm priority. For more information on adding an Alarm Summary object to a picture and using these features, refer to the sections [Adding the Alarm Summary Object to a Picture](#) and [Configuring the Alarm Summary Object](#).

## Displaying the Alarm History

While the Alarm Summary object provides operators a real-time list of active alarms, it does not maintain a history of the alarms that have occurred. One way you can view a history of alarms received is to start the Alarm History application. This program displays a history of the last 200 alarms and messages that have occurred on the local computer.

For information on enabling the Alarm History Service, refer to the section [Configuring the Alarm File and Alarm History Services](#).

## Archiving Alarms

You can save alarms and messages for historical reference by enabling the Alarm Printer, Alarm File, and Alarm ODBC services. The Alarm Printer and Alarm Files services are particularly well-suited for this task because they both generate output that you can conveniently review with minimum effort. The Alarm Printer Service sends alarms and messages to a printer, while the Alarm File Service, by comparison, generates a text file.



For more information on enabling these services, refer to the sections [Configuring an Alarm Printer Service](#) and [Configuring the Alarm File and Alarm History Services](#).

### **Working with the Alarm ODBC Service**

Another way to save and analyze iFIX alarms and messages is to enable the Alarm ODBC Service. This service sends alarms and messages to an ODBC relational database, allowing you to retrieve any information you want by querying the database.

You can send alarms and messages to Microsoft® SQL Server and Oracle® relational databases. For supported versions, refer to the [Software Requirements](#) section of the Getting Started with iFIX e-book. Other ODBC databases, while not tested by GE, may also work.

For more information on enabling the Alarm ODBC Service, refer to the section [Configuring the Alarm ODBC Service](#). For more information on setting up your relational database, refer to your ODBC manuals and the [Using SQL](#) manual.

## **Using the Alarm Horn**

When a new alarm occurs in the system, iFIX can notify you through the Alarm Horn. When enabled, the Alarm Horn sends a continuous beeping sound through your PC's speakers to inform you of a new alarm.

The horn repeats at three speeds to distinguish between low, medium, and high priority alarms. A one-second increment between beeps signifies high priority alarm, a two-second increment signifies a medium priority, and a three-second increment signifies a low priority. You can enable or disable the Alarm Horn, or silence the horn for the current set of alarms.

When you disable the alarm horn you shut off the alarm horn feature. If there are new alarms after you disable the feature, the horn does not sound.

When you silence the horn, you stop the horn for the current set of alarms. If new alarms occur after you silence the horn, the horn begins to sound again. You can either continue to silence the horn for each new alarm, or disable the horn. The horn is also silenced when you acknowledge any alarm.

**NOTE:** You do not need to have an alarm summary OCX in the current picture or the WorkSpace up and running for the alarm horn to work.

## **Silence Alarm Horn Dialog Box**

The Silence Alarm Horn dialog box displays the following items:

### **Enable Alarm Horn**

Select this check box to enable the alarm horn. Clear this check box to disable it. When you disable the alarm horn you shut off the alarm horn feature. If there are new alarms after you disable the feature, the horn does not sound.

### **Silence Horn**

Click this button to silence the horn. When you silence the horn, you stop the horn for the current set of alarms. If new alarms occur after you silence the horn, the horn begins to sound again. You can either

continue to silence the horn for each new alarm, or disable the horn. The horn is also silenced when you acknowledge any alarm.

## Getting Started

iFIX gives you easy access to its alarm system by making it accessible through several different applications. The chapter describes these applications, and provides examples and instructions to help you plan your alarm strategy. Where the descriptions require more detail, we direct you to other manuals for more information.

Refer to the following sections for more information on getting started with alarms and messages:

- [Before You Begin](#)
- [Working with the SCU Toolbox](#)
- [Working with Database Manager](#)
- [Working with the iFIX WorkSpace](#)
- [Implementing an Alarm Strategy: Overview](#)
- [Sharing Alarms with Other iFIX and FIX Nodes](#)

### Before You Begin

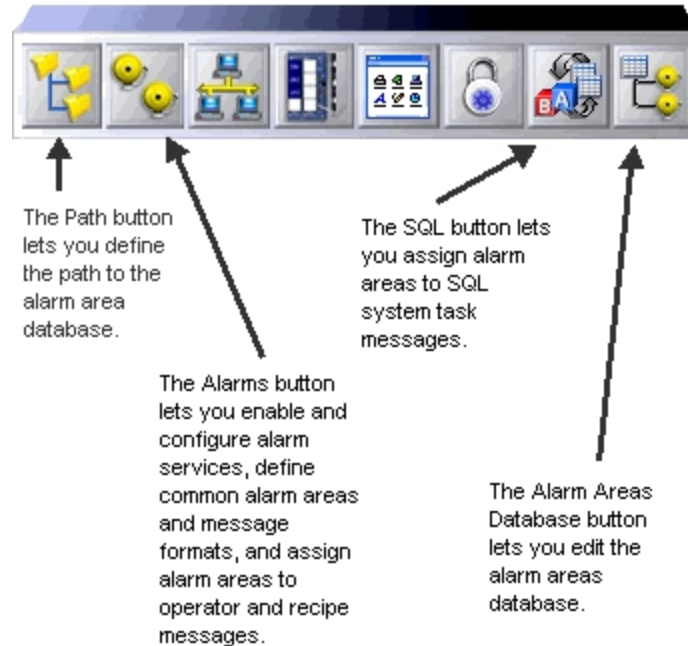
Before you start to configure the iFIX alarm system, verify that all your hardware is configured and working properly. This includes your nodes, alarm printers, relational databases, and file servers. Configure alarm printers as local printers; you cannot route alarms to a network printer.

Once this hardware is set up, verify that each computer can access the file servers, relational databases, and printers. For information on setting up your hardware for use with iFIX, refer to the [Setting up the Environment](#) manual.

One of the main applications for implementing an alarm strategy is the System Configuration Utility (SCU). This program provides a set of tools for:

- Enabling, disabling, and configuring alarm services, and configuring the alarm horn.
- Editing and maintaining the alarm area database.
- Defining a common set of alarm areas for all alarm destinations.
- Defining specific alarm areas for each alarm destination.
- Defining a common alarm format.
- Assigning alarm areas to operator, recipe, and SQL system task messages.
- Specifying the path to the alarm area database.

These tools are available from the SCU toolbox, as the following figure shows:



### SCU Toolbox

For more information about the SCU, refer to the [Setting up the Environment](#) manual.

## Working with Database Manager

Database Manager lets you configure database blocks to generate alarms and event messages. You can also define a block's alarm limits and priority.

Note that not all blocks can generate alarms and event messages. To learn more about the specific alarm capabilities of individual blocks, refer to the [iFIX Database Reference](#).

## Working with the iFIX WorkSpace

Your main tool for displaying alarms in pictures is the iFIX WorkSpace. This application provides an integrated development environment for creating pictures and displaying them to operators.

For more information on working with pictures and the iFIX WorkSpace, refer to the manuals [Creating Pictures](#) and [Understanding iFIX](#), respectively.

## Implementing an Alarm Strategy: Overview

After you set up your hardware and install iFIX, you can enable alarming and implement your alarm strategy.

► **To enable alarming and implement your alarm strategy:**

1. Name your alarm areas in the Alarm Area database. If you want to share the database, move the file ALARMAREAS.AAD to your file server.
2. Specify each computer's Alarm Areas path. If you are using a file server, enter the network path as the Alarm Areas path.
3. Define the default (common) alarm and message format.
4. Select the common alarm areas.
5. Enable and configure the node's alarm services.
6. Assign alarm areas to your operator and recipe messages. If you enable the SQL support in the SCU, assign alarm areas to SQL system task messages as well.
7. On your SCADA servers, configure your database blocks by enabling alarming and event messaging, assigning alarm areas, selecting an alarm priority, and defining alarm limits.
8. On your View clients, create pictures that display alarms in Data links, Alarm Summary objects, and by animating objects.

## Improving Alarm Throughput

If you find that your system response time is not acceptable, because of the amount of alarms being processed, it is possible to configure the amount of work involved in processing a single alarm. The Alarm Summary alarm lists are updated for every alarm. These alarm lists include every possible Alarm Summary sorting type. For example, this includes: Priority, Acknowledge/Priority, TimeIn, TimeLast, Acknowledge/TimeLast, and so on.

If there are some alarm sorting types that are of no interest to you (no Alarm Summaries will be using them), it is possible to disable some alarm lists from being updated. This frees up system resources.

To do this, configure the Alarm.ini file in the iFIX Local path. If you installed iFIX to the default location, this path is: C:\Program Files (x86)\GE\iFIX\Local. In the [SUMMARY] section, use the DisableAckTLSort, DisableAckTimeSort, DisableAckPriSort, DisableTimeLastSort settings to disable these sorting types. The following is an excerpt from the Alarm.ini file which explains these settings.

```
[SUMMARY]
;   DisableAckTLSort
;   DisableAckTimeSort
;   DisableAckPriSort
;   DisableTimeLastSort
;   When TRUE indicates that Almsum.exe does not have to update these lists
;   since no Alarm Summary is using it as a sort and allows the Almsum.exe
;   thread to be quicker. The list upkeep is default behavior otherwise.
;   Default can be FALSE or no entry here.
DisableAckTLSort=FALSE
DisableAckTimeSort=FALSE
DisableAckPriSort=FALSE
DisableTimeLastSort=FALSE
```

## Sharing Alarms with Other iFIX and FIX Nodes

iFIX 4.0 can share alarms and data with previous versions of iFIX, as well as with FIX32 6.15 and FIX v7.0. FIX32 view nodes will only receive alarms from alarm areas A-P.

**NOTE:** You cannot run iFIX and FIX 6.x or greater at the same time on a single computer.

iFIX 4.0 will map alarm priorities from legacy systems to the middle three alarm priorities: HIGH, MEDIUM, and LOW.

Outgoing alarms from iFIX 4.0 to iFIX 3.5 or older systems will map CRITICAL, HIHI, and HIGH alarm priorities to a HIGH priority; MEDIUM to a MEDIUM priority; LOW, LOLO and INFO to a LOW priority.

## Implementing an Alarm Strategy

Before you implement an alarm strategy, take the time to think about the blocks that should generate alarms, the alarm destinations that will receive them, and how you want to display alarms to your operators. Once you have collected this information, you can quickly implement your alarm strategy.

This chapter discusses additional issues you need to consider when implementing alarming. It includes the following sections:

- [Design Goals](#)
- [Identifying Alarm Areas](#)
- [Identifying Your Most Critical Blocks](#)
- [Filtering Alarms with the Alarm Summary Object](#)
- [Filtering Alarms on iFIX and FIX32 Clients with the FilterAlm.ini File](#)

### Design Goals

Your main design goal when implementing an alarm strategy is to create a flexible alarm system that delivers the information you require. This approach lets you create operator displays that show, filter, and sort alarms in any combination.

► **To implement an alarm strategy:**

1. Identify alarm areas in your plant and assign them to database blocks and alarm destinations.
2. Identify your most critical blocks.
3. Develop an alarm-filtering scheme.

### Identifying Alarm Areas

The simplest way to identify the alarm areas in your plant is to create one alarm area for each physical division at your site. Assign a name that reflects what that area manufactures and that is easy to remember.

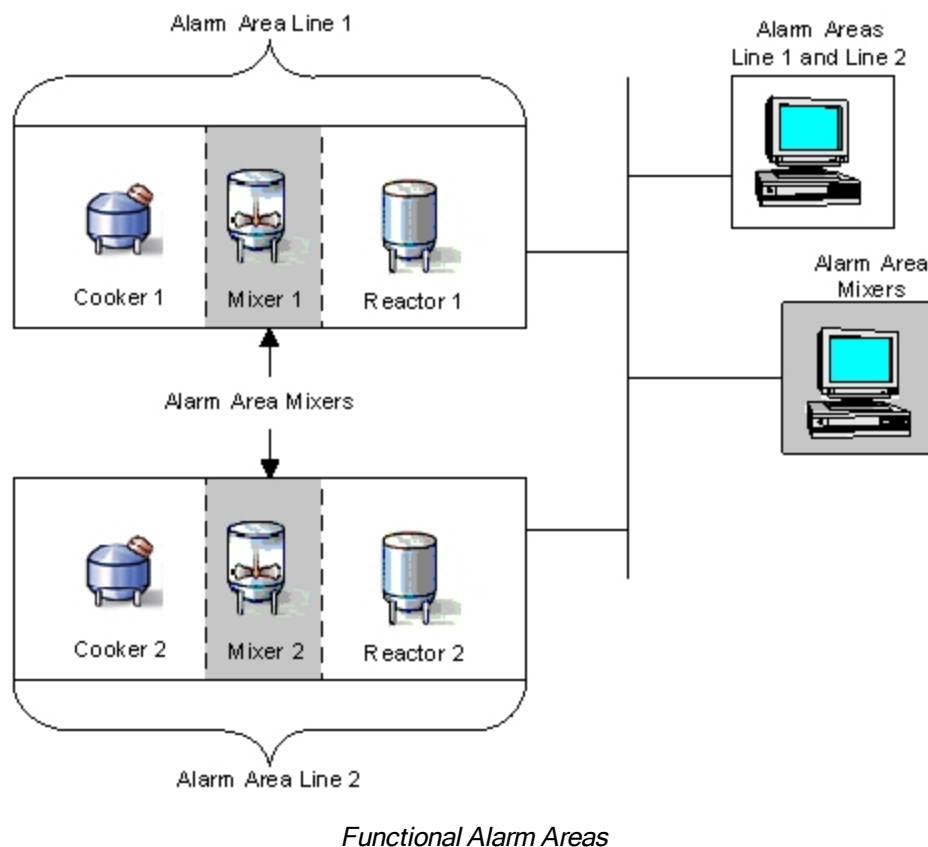
For example, if one area manufactures regular beer and another makes light beer, you might name the alarm areas BEER and LIGHT\_BEER.

For more information, refer to:

- [Identifying Functional Alarm Areas](#)
- [Identifying Site-Wide Alarm Areas](#)
- [Identifying Company-Wide Alarm Areas](#)

## Identifying Functional Alarm Areas

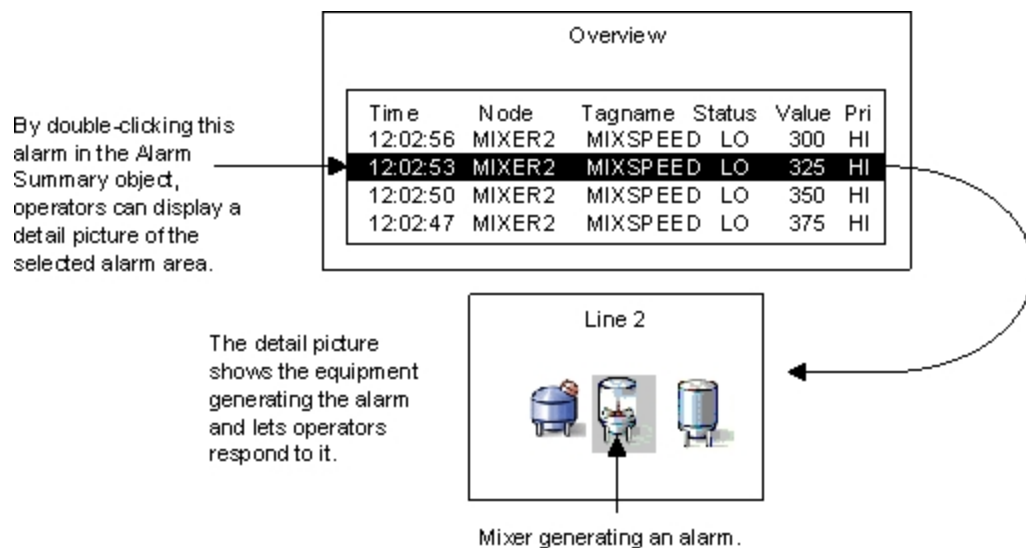
In addition to creating alarm areas by production line (physical divisions), it is a good idea to create functional alarm areas. Typically, this is done when attributes of your process hardware are critical to the manufacture of a product. These attributes can be anything, such as the temperature of an oven or the speed of a mixer. For example, suppose you want to generate an alarm whenever the speed of the mixers in your production lines fall below 500 rotations per minute (RPM). One way to do this is to create a functional alarm area called MIXERS and assign this area to the blocks that monitor each mixer, as the following figure shows. Then, enable the Alarm Summary Service to report alarms from these blocks.



## Identifying Site-Wide Alarm Areas

Creating operator displays that report alarms from physical and functional alarm areas is helpful, but very often you want to create an overview picture so that operators can monitor your entire plant from one screen. Such pictures:

- Show each alarm area and display new (unacknowledged) alarms by animating an object in the picture. For example, your overview picture could color an object or change the color's visibility when a new alarm occurs.
- Let operators open a detailed picture of each area to determine the specific blocks that are in an alarm state. For example, the overview picture in the following figure shows an Alarm Summary object. When an alarm occurs, the operator can click the alarm in the Alarm Summary object and display a detailed picture of that alarm area.



You can create such overview pictures by adding an Alarm Summary object to your overview pictures and creating an alarm area for your entire production site. Once you create the site-wide alarm area, you can assign it to all your database blocks and alarm destinations. This ensures that iFIX reports all alarms to the overview picture. For example, assume the alarm areas for your production lines are named Line 1, Line 2, and Line 3 and the name of your site-wide alarm area is called Overview. Then you would assign alarm areas as the following table describes.

Enter the alarm area names...	For blocks and alarm destinations in area...
Line 1 and Overview	Line 1
Line 2 and Overview	Line 2
Line 3 and Overview	Line 3

Once you assign the site-wide alarm area to the blocks in your database, you associate your detail pictures and the process database blocks by entering the picture's name in the associated block's Alarm Extension field. This step stores the file names of your detail pictures with their associated database blocks. For more information on the Alarm Extension fields, refer to the [iFIX Database Reference](#).

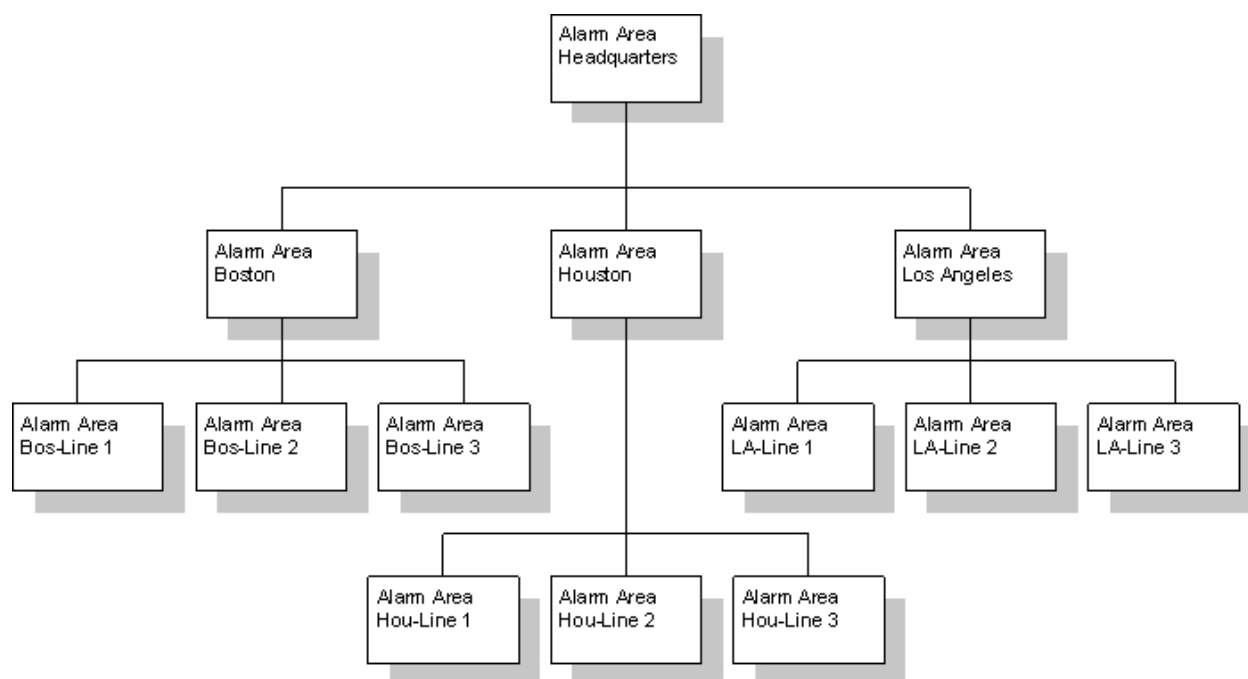
Your final step in creating an overview picture is to write scripts that display your detail pictures when you double-click an alarm from the Alarm Summary object. For more information about writing scripts that work with the Alarm Summary object, refer to the [Writing Scripts](#) manual.

## Identifying Company-Wide Alarm Areas

In addition to site-wide pictures, you can also create a company-wide overview picture to show alarms from production sites in different cities.

► To create a company-wide overview picture that shows alarms from different areas:

1. Add an Alarm Summary object to your company-wide overview picture.
2. Create a company-wide alarm area. Give it a meaningful name, such as HEADQUARTERS.
3. Rename your alarm areas so that they are unique across your entire company. For example, you cannot have an alarm area named Line 1 in both your Boston and Houston plants because operators at your corporate headquarters will be unable to distinguish alarms from the two sites. Instead, name the alarm areas uniquely, such as Bos-Line1 and Hou-Line1.
4. Assign site-wide alarm areas by city, as the following figure shows.



*Creating Company-Wide Alarm Areas*

## Identifying Your Most Critical Blocks

Up to now, we have been discussing how to implement an alarm strategy in a hierarchical manner. This approach requires you to identify alarm areas by physical divisions and create an overview picture. However, if your alarm requirements do not warrant a hierarchical approach, you may find it easier to enable alarming for your most process-critical blocks. This action prioritizes your alarms, conserves system resources, and keeps the number of alarms to a minimum.



Depending on the number of database blocks that report alarms, you may also want to assign alarm areas according to the descriptions in the following table.

<b>If you have a...</b>	<b>You may want to...</b>
Small number of blocks that report alarms	Accept the default alarm area, ALL, or assign the pre-named alarm areas A through P, if you require more than one alarm area.
Large number of blocks that report alarms	Create alarm areas by physical or functional divisions.

## Filtering Alarms with the Alarm Summary Object

One way to prioritize your alarms is to enable alarms in your most critical blocks. There are alternate methods, however. For example, you can also give alarms from certain blocks greater importance by selecting the block's alarm priority. Using the alarm priority, you can filter alarms in the Alarm Summary object by selecting the priority you want to display. By filtering alarms in this manner, you eliminate extraneous alarms and focus the operators' attention on the alarms that appear.

The Analog Alarm block lets you filter alarms in a similar way by letting you assign different priorities to different alarm types. For example, if deviation alarms are critical to your process, you could assign a CRITICAL priority to those alarms and a HIHI, HIGH, MEDIUM, LOW, LOLO, or INFO priority to the other alarms the block generates. Then, using the Alarm Summary object, you could display the block's CRITICAL priority alarms. For more information about the Analog Alarm block, refer to the [iFIX Data-base Reference](#).

In addition to filtering by priority, the Alarm Summary object lets you filter on other alarm attributes such as the alarm area, description, time, date, data source, and SCADA server. You can combine two or more of these criteria to create powerful and complex filters.

For example, you could create a filter to display all CRITICAL priority alarms, all alarms in the alarm areas MIXERS or Line 1, and alarms generated by the SCADA server MIXER2 by using the following text:

```
Priority = "CRITICAL" AND (Area In "MIXERS" OR Area In "LINE 1") AND Node In "MIXER2"
```

For more information about creating your own filters with the Alarm Summary object, refer to the section [Filtering Alarms](#).

The filters you create with the Alarm Summary object are not static. You can change them at run-time using a VBA script. To learn how to write a VBA script for the Alarm Summary object, refer to the [Writing Scripts](#) manual.

## Filtering Alarms on iFIX and FIX32 Clients with the FilterAlm.ini File

You can filter the alarms sent to each iFIX or FIX32 client by creating a FilterAlm.ini file. With this file, you can define the individual areas that a node receives alarms from, and restrict the nodes that receive alarms.

The FilterAlm.ini helps you avoid unnecessary network traffic, which ultimately reduces the load on the iFIX and FIX32 client nodes. When there is less load on the network, alarms appear at their destination nodes faster.

► **To filter alarms sent to each client using the FilterAlm.ini file:**

1. Open a text editor, such as Microsoft® Notepad or Wordpad.
2. Create a text file and then save the empty file as FilterAlm.ini in the C:\Program Files (x86)\GE\iFIX\LOCAL folder.
3. Copy and paste the following lines into the FilterAlm.ini file:

```
[ALARMCLIENTS]
    NODENAME1=CLIENT1_NAME
    NODENAME2=CLIENT2_NAME
    NODENAME3=CLIENT3_NAME

[CLIENT1_NAME]
a1=A

[CLIENT2_NAME]
a1=B
a2=C

[CLIENT3_NAME]
a1=NONE
```

The following table describes the variables used in the FilterAlm.ini file example:

Variable	Description
NODENAME1, NODENAME2, NODENAME3	Identify the nodes for which you want to specify a filters. For each node that you want to filter alarms for, enter the word NODENAME, immediately followed by a number.  These entries must appear in order (NODENAME1, NODENAME2, NODENAME3, and so on). If you delete a line you must renumber the other NODENAMES.  <b>NOTE:</b> NAM.exe will only read the first 200 node names listed in the FilterAlm.ini for processing.
CLIENT1_NAME, CLIENT2_NAME, CLIENT3_NAME	Represent the actual names of the iFIX or FIX32 nodes.  <b>NOTE:</b> If you do not want to filter alarms for a specified client, do not include it in this list.
a1, a2	Identify the areas for which you want to include alarms. For each area that you want to add to the list, enter the letter a, immediately followed by a number.  These areas must appear in order (a1, a2, a3, and so on). If you delete an entry for a specified client, you must renumber the other entries so that they all appear in order.
A, B, C	The actual name of the alarm area. FIX32 clients can only receive alarms from alarm areas A through P, while iFIX clients can receive alarms from areas A through P, as well as custom alarm area names, as long as custom alarm area names are entered in all uppercase.  <b>NOTE:</b> The custom alarm areas have to be in uppercase in the alarm area database for the FilterAlm.ini file to work properly.
NONE	Specifies that no alarms should be sent to this client.  <b>NOTE:</b> You can use the word ALL to receive all alarms for a specified client, but it is more efficient just to leave out that client from the list all together. By default, if a client is not listed, all alarms are sent to it.

4. Save the file.

## Common Questions about the FilterAlm.ini File

This section describes some common questions that users have on FilterAlm.ini file and how it works.

### How Are Alarms Filtered?

If a FilterAlm.ini file exists in your C:\Program Files (x86)\GE\iFIX\LOCAL folder on the iFIX SCADA node, then iFIX distributes alarms from designated areas to each client as specified in the FilterAlm.ini file. If a client is not specified in this file, all alarms are sent, and no filtering occurs on this client.

## What Happens If I Do Not Use a FilterAlm.ini File?

If the FilterAlm.ini does not exist, then the iFIX SCADA distributes all alarms to all attached clients. There is no additional filtering performed for each node.

## What Alarms Appear on a Client That Does Not Appear in the FilterAlm.ini File?

If an iFIX or FIX32 client is omitted from the FilterAlm.ini file, then the omitted client receives all alarms from all areas in the iFIX SCADA. In this case, there is no additional filtering on the omitted client, only.

## How Do I Properly Remove a Node Name from the List?

If you remove a node name from the [ALARMCLIENTS] section of the FilterAlm.ini file, you must renumber the node names. For example, say you have the following node names defined:

```
[ALARMCLIENTS]
  NODENAME1=CLIENT1_NAME
  NODENAME2=CLIENT2_NAME
  NODENAME3=CLIENT3_NAME
```

If you remove NODENAME2=CLIENT2\_NAME, then you must renumber NODENAME3=CLIENT3\_NAME to NODENAME2=CLIENT3\_NAME, so that the list now reads:

```
[ALARMCLIENTS]
  NODENAME1=CLIENT1_NAME
  NODENAME2=CLIENT3_NAME
```

## What if I Delete Portions of the FilterAlm.ini File?

If you delete all of the contents of the FilterAlm.ini or delete all defined Client subsections while iFIX is running, then the Network Alarm Manager retains the last configured alarm filtering settings. You must delete the file entirely to disable filtering.

## Are Alarms Removed From a Node After You Create a FilterAlm.ini File?

No. Once you create a FilterAlm.ini file, iFIX does not remove previous alarms sent to the specified client nodes. The FilterAlm.ini file only prevents future alarms from being sent, after the Network Alarm Manager reads the file.

## How Long Does it Take the Network Alarm Manager to Read the FilterAlm.ini file?

This process is usually immediate but could take up to several minutes, depending upon the number of clients and alarm areas that you are filtering.

## Is the Text in the FilterAlm.ini File Case Sensitive?

The text in the FilterAlm.ini file is *not* case-sensitive.

# Configuring Messages

This chapter describes the different types of iFIX messages. It also explains how to enable event messaging, assign alarm areas to messages, and define a common message format. It includes the following sections:

- [Understanding Event Messages](#)
- [Understanding Application Messages](#)
- [Understanding System Messages](#)
- [Defining a Common Alarm and Message Format](#)

## Understanding Event Messages

Like alarms, you can enable or disable event messages in database blocks. When enabled, event messages provide information on database events. These events, such as when a valve opens or closes, do not indicate a problem or require an operator response.

The following blocks generate event messages:

- Digital Input
- Digital Output
- Digital Register
- Analog Output
- Analog Register
- Text

The following table summarizes when these blocks generate an event message.

Generating Event Messages	
The block...	Generates an event message when it...
Digital Input	Enters an alarm state.
Digital Output	Sends values to the process hardware.
Digital Register	
Analog Output	
Analog Register	
Text	Changes its current value.

Event messages inherit the alarm areas of the blocks that generate them. Once a database block generates a message, iFIX routes it to all enabled alarm destinations in the block's alarm areas except the Alarm Summary Service. In this way, you can use other alarm services, such as the Alarm File or Alarm Printer services, to record the events that occur in your process database.

The Alarm Summary service does not receive event messages because it displays real-time events requiring a response (alarms). Since messages do not require a response, iFIX does not send them to the service.

## Understanding Application Messages

Application messages describe database-related activity generated by an iFIX application or entered by an operator. For example, when an operator enters a value into a Data link or a recipe downloads, iFIX generates an application message.

iFIX provides the following types of application messages:

- [Operator](#)
- [Recipe](#)
- [Program block](#)

- [Script](#)
- [SQL system task](#)
- [Auto Alarm Manager](#)

## Operator Messages

iFIX monitors all database changes and creates an operator message whenever operators:

- Change a process value.
- Load or save a process database.
- Log into iFIX.

The text of an operator message includes any change an operator makes to a database block, the name of the View client where the change occurred, and the login name of the operator (if security is enabled), as the following example shows:

```
15:45:17.8 [MIXER1] AITEMP16 Block placed ON SCAN by STATION1::JOHN
```

### Local Operator Messages

Operator messages that are not related to an action on a tag are considered Local Operator Messages. For example, the message sent when a user logs into or out of a user account is a Local Operator Message. By default, Local Operator Messages are sent to the client node's first SCADA node. The SCADA node in turn distributes the message to its clients.

Optionally, you can specify the SCADA node to send the Local Operator Messages to. For instance, you might want to control where the messages get sent to if you are archiving alarms and files to a local file when using the Alarm File Service.

To configure this option, edit the Network.INI file located in the iFIX Local folder on the client node. After editing and saving the Network.INI file, restart iFIX on the client node so the changes take effect. In the [TCPIP] section, add the following parameter:

```
LocalOperatorMessages = <the name of the SCADA node>
```

For example, your Network.INI file might look like this after adding the LocalOperatorMessages parameter:

```
[TCPIP]
accept_unknown_host=ON
LocalOperatorMessages=SCADA119
[WRITEACCESS]
accept_unauthorized_writes=ON
log_unauthorized_writes=ON
```

In this example, Local Operator Messages will be sent to the SCADA node called "SCADA119".

The LocalOperatorMessages parameter is meant to be used primarily on client nodes, but it can be used on a SCADA node that acts as a client to another SCADA node.

The specified SCADA node must be in the client node's Remote Node List in order for this feature to function reliably. The node name can be either a logical or physical SCADA node name. If the SCADA

node is a redundant pair, the message will be sent to the active SCADA node. If the client cannot find the specified SCADA node, it sends the message to the first SCADA node.

Keep in mind that when the LocalOperatorMessages parameter is specified on a redundant SCADA node, a Local Operator Message may not be distributed to the SCADA's partner node. The message will be distributed to the SCADA node specified in the LocalOperatorMessages parameter and its clients.

## Recipe Messages

The Recipe Builder can keep an audit trail of recipe activity. Using the audit trail, you can track when a recipe is uploaded, downloaded, or saved. Whenever one of these activities occurs, iFIX generates a recipe message. For more information about the audit trail and recipe messages, refer to the [Creating Recipes](#) manual.

## Program Block Messages

You can configure a Program block to send messages using the MSG command. When this command executes, the Program block sends a message to all alarm destinations in the block's alarm area. For more information about the Program block and the MSG command, refer to the [iFIX Database Reference](#).

## Script Messages

Using a Visual Basic for Applications (VBA) script, you send any data to an alarm destination with the SendOperatorMsg method. This method sends your data as an operator message. For more information about using the SendOperatorMsg method, refer to the iFIX Automation Interfaces Help file.

## SQL System Task Messages

If you enable the SQL system task in the SCU, your alarm destinations may receive error and debug messages from it. Error messages indicate an error that the system task encountered. Debug messages are informational messages that help you troubleshoot the computer's connection to the relational database. For example, if the system task fails to update a column in the relational database, it generates an error message. When the system task logs into the relational database and establishes its connection, it generates a debug message.

Using the SCU, you can route SQL system task messages to specific alarm areas, as you can operator or recipe messages. For more information on routing SQL system task messages, refer to the section [Configuring iFIX for Relational Databases](#) in the Setting up the Environment manual.

## Auto Alarm Manager Messages

The Auto Alarm Manager lets you receive alarms automatically from an unstaffed remote site using a modem. The receiving (local) node treats these alarms as operator messages so that operators can mon-

itor the remote site from a central location. For more information on using this program and receiving remote alarms, refer to the [Using Auto Alarm Manager](#) section.

## Distributing Application Messages

You can configure iFIX to route application messages to selected alarm destinations. Using the SCU, you can assign alarm areas to operator and recipe messages. iFIX automatically routes VBA script and Program block messages to the operator message alarm areas. You can assign alarm areas to SQL system task and Auto Alarm Manager messages when you configure the SQL system task and the Auto Alarm Manager, respectively. Refer to the following sections for more information on completing these tasks.

To assign alarm areas to...	Refer to the section...
SQL system task messages	<a href="#">Configuring iFIX for Relational Databases</a> in the Setting up the Environment manual
Auto Alarm Manager messages	<a href="#">Using Auto Alarm Manager</a>

### Filtering Out Operator Messages

If operators adjust process values at your site and you do not need to save these changes, you can filter out the resulting operator messages.

► To filter out the resulting operator messages:

1. Assign an alarm area exclusively for operator messages.
2. Do not assign this alarm area to any alarm destination.

## Understanding System Messages

System messages provide information about completed tasks and errors. iFIX generates a system message when:

- A database finishes loading.
- The state of a network session changes.
- An I/O driver detects an error.
- The Scan, Alarm, and Control (SAC) program:
  - Starts up.
  - Completes a specific task.
  - Encounters specific database block or chain errors.
  - Encounters run-time or system errors.

## System Alert Messages



iFIX also generates *system alert messages*. A system alert message is a system message that pops up the System Alert Message Viewer to inform operators of an error. The error may come from an iFIX application or it may come from a background task, such as SAC or an alarm service.

For example, system alert messages from alarm services warn about losing alarms. Should this happen, it means the alarm service's alarm queue is not configured correctly and needs to be adjusted. For more information on adjusting alarm queues, refer to the section [Modifying the Alarm Queues](#).

Using the System Alert Message Viewer, you can display all system alert messages or only new messages. You can also clear all of the messages currently displayed. To complete these tasks, use the following buttons and options at the bottom of the Viewer:

**Show all entries** - Displays all of the current system alert messages.

**Show new entries only** - Displays only new system alert messages.

**Maximize this dialog on next new entry** - Maximizes the System Alert Message Viewer the next time it receives a system alert message.

**Do not display this dialog again** - Disables the System Alert Message Viewer so it does not appear again.

**Clear screen** - Removes system alert messages from the screen.

**Exit** - Closes the System Alert Message Viewer.

## Defining a Common Alarm and Message Format

You can define a common alarm and message format for the Alarm File, Alarm Printer, and Alarm History Services. The common format defines the alarm and message fields received by these alarm services. These fields provide the:

- Date and time of the alarm or message. The supported date format is month/day/year (mm/dd/yyyy) and is determined by the Regional Settings control. The default time format is hour:minute:second.subsecond (hh:mm:ss.n). You can change this to display time down to the millisecond.
- Name of the SCADA server and block that generated the alarm or message. If you enable logical node names in the SCU, the name of the SCADA server is the logical name you define.
- Block's current value, engineering unit (EGU) label, description, and alarm state (for example, High, Low, Deviation).

In addition, you can also:

- Enter the field length. If a field is not long enough to hold all of its data, iFIX truncates the text.
- Arrange the order of the fields by moving each field name up or down in a list with arrow buttons. Fields at the top of the list appear first in the alarm or message.

## Configuring Alarms

This chapter explains how to configure database blocks for alarming and enable the iFIX alarm system. It also describes how to set up SCU alarm features, such as alarm areas, alarm services, and the alarm area database. For more information on the configuration topics, refer to the following section:

- [Defining Alarm Areas](#)
- [Entering Alarm Limits](#)
- [Selecting the Alarm Priority](#)
- [Enabling and Disabling Alarming](#)
- [Assigning Alarm Areas](#)
- [Enabling and Disabling an Alarm Service](#)
- [Configuring an Alarm Printer Service](#)
- [Configuring the Alarm File and Alarm History Services](#)
- [Configuring the Alarm ODBC Service](#)
- [Configuring the Alarm Network Service](#)
- [Configuring the Alarm Startup Queue Service](#)
- [Configuring the Alarm Summary Service](#)
- [Configuring the Frequency of Alarm Cycles](#)
- [Understanding the Alarm Area Database](#)

## Defining Alarm Areas

One of your first tasks when configuring alarms is to create alarm areas by naming them. iFIX provides 16 default alarm areas, named A through P; however, you can rename the default areas or add new ones by clicking the Alarm Area Database button on the SCU toolbox. Each alarm area name you enter must be unique and can be up to 29 alphanumeric characters.

In order to enter or edit an alarm area name, iFIX must be running. In addition, you can only edit the alarm area database from a SCADA server.

**NOTE:** Alarm area names cannot contain the characters "\*", "?", or "\".

## Entering Alarm Limits

Once you create alarm areas, you can configure your process database for alarming by entering alarm limits for analog blocks and alarm conditions for digital blocks. Refer to the following sections for more information:

- [Understanding Analog Block Alarm Limits](#)
- [Alarm Conditions for Digital Blocks](#)

Alarm limits for other blocks either have custom rules or do not support alarming. For more information about these exceptions, refer to the [Database Block Reference](#).

## Understanding Analog Block Alarm Limits

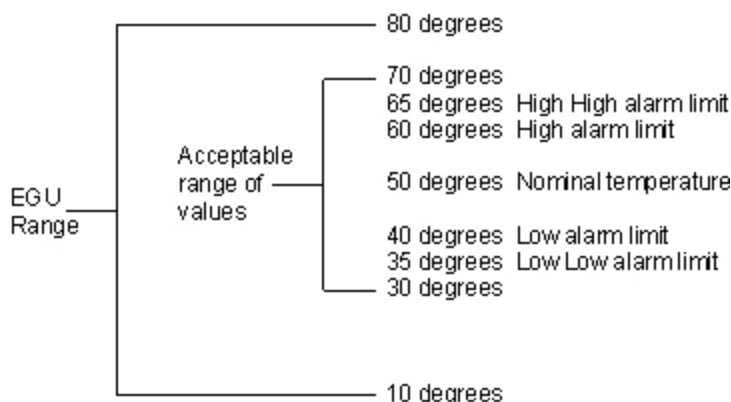
The following table summarizes the alarm limits available with analog blocks.

Common Analog Block Alarm Limits	
When the alarm limit is...	It defines...
High	High process values. The block value must exceed this limit to generate an alarm.
High High	Critically high process values. The block value must exceed this limit to generate an alarm.
Low	Low process values. The block value must fall below this limit to generate an alarm.
Low Low	Critically low process values. The block value must fall below this limit to generate an alarm.
Rate of Change	Process values that change too quickly. If a process value fluctuates by more than the rate of change limit in a single scan cycle, the block generates an alarm.
Deviation	Process values that change from the optimum value. Deviation alarms require you to define a target value and range. If the process value exceeds the range, a deviation alarm occurs. For example, if the optimum value is 100 and the range (dead-band) is +/-5, the process can vary from 95 to 105 without generating an alarm.

The block's EGU range defines the range of values you can enter for its alarm limits. For example, if the EGU range is 0 to 100, the lowest value you can enter is 0; 100, the largest. Since the block's value must exceed the alarm limit to generate an alarm, setting the alarm limit to the maximum or minimum EGU value disables alarms for the block.

### Example: Alarm Limits for Analog Blocks

Suppose you want to monitor the temperature of a refrigeration unit. The unit holds kegs of beer that are aged prior to shipment. The beer must be kept between 30 and 70 degrees to prevent spoiling. The following figure shows how you could define alarm limits for the unit.



Notice how the High and High High alarms are set. This configuration provides operators with an early warning that the temperature has increased. Likewise, the Low and Low Low alarms provide operators with an early warning that the temperature has fallen.

If you do not want early detection of a temperature change, you can set the High and High High alarms to 70 and the Low and Low Low alarms to 30.

## Alarm Conditions for Digital Blocks

Because they only have two possible values (zero or one), digital blocks have different alarm settings. The following table summarizes these alarm conditions.

Common Digital Block Alarm Conditions	
The alarm condition...	Generates an alarm when...
Change from Normal Open	The block value changes from a one to a zero.
Change from Normal Close	The block value changes from a zero to a one.
Change of State	The block value changes in either direction.

### Example: Alarm Conditions for Digital Blocks

Suppose you have a circulating pump in a tank and you want to monitor whether the pump is running (closed) or is not running (open). In this situation, you would select the alarm condition Change from Normal Open so that when the pump stops, the digital block monitoring the pump generates an alarm.

## Selecting the Alarm Priority

In addition to entering alarm limits, you should select an alarm priority for your database blocks. By default, Database Manager sets the priority to LOW, but you can set a block's priority to INFO, LOLO, LOW, MEDIUM, HIGH, HIHI, or CRITICAL. Typically, you set the priority of your most critical blocks to distinguish the alarms they generate from other alarms. Then, using the Alarm Summary object, you can filter or color your alarms by priority. For more information on using the Alarm Summary object, refer to the section [Understanding the Alarm Summary Object](#).

You can also use the Analog Alarm block to assign different priorities to different alarm types. For example, if deviation alarms are critical to your process, you could assign a CRITICAL priority to those alarms and an INFO, LOLO, LOW, MEDIUM, HIGH, or HIHI priority to the other alarms the block generates. For more information about this block, refer to the [iFIX Database Reference](#).

## Enabling and Disabling Alarming

You can enable or disable alarming for database blocks that support it, such as Analog Input and Digital Input blocks.

Once you enable alarming and place these blocks on scan, iFIX immediately begins to monitor them for alarm conditions based on the alarm limits you entered. Alarming is enabled by default.

## Suspending Alarms

With the Analog Alarm and Digital Alarm blocks, you can suspend alarms. Suspending alarms temporarily disables alarming and provides intelligent alarm-handling by defining a block and field name pair.

When the value of the block and field name is zero, the block processes alarms. When the value is greater than zero, the block suspends alarms and generates a suspend-alarm message.

While suspending alarms, the Analog Alarm or Digital Alarm block opens the contacts associated with each alarm type. iFIX also automatically acknowledges all of the block's alarms and displays DISABLED in Data links to the current and latched alarm fields (A\_CUALM and A\_LAALM, respectively). When alarm processing resumes, the block treats any currently existing alarm conditions as new alarms and sends a resume-alarm message.

You can also select to suspend an alarm but still have a message appear. This option allows alarm processing to continue and records each alarm state transaction in the alarm logger but does not display in the alarm summary.

For more information on configuring these blocks, refer to the [iFIX Database Reference](#).

## Assigning Alarm Areas

As the following table shows, assigning alarm areas to database blocks and alarm services is a straightforward process.

To assign an alarm area to... You...	
A database block	Select up to 15 areas from the alarm area database or select ALL.
An alarm service	Do one of the following: <ul style="list-style-type: none"><li>• Select one or more alarm areas from the alarm area database.</li><li>• Select the common alarm areas.</li><li>• Select the alarm area ALL.</li></ul>

When you assign ALL as the alarm area, database blocks send alarms to every alarm area, and each alarm service receives alarms from every alarm area.

## Assigning Common Alarm Areas

In addition to assigning ALL, you have the option of assigning *common alarm areas* to alarm services. A common alarm area is any area you want to share among the enabled alarm services on the local computer. By making an alarm area common, you simplify the configuration process.

For example, assume the View client STATION1 has the Alarm Printer, Alarm File, and Alarm History Services enabled. By sharing all of STATION1's alarm areas, you eliminate the need to manually assign alarm areas to these alarm services. Instead, the SCU automatically assigns the common alarm areas to each enabled service.

In general, you select the common alarm areas from the alarm area database. However, you may want to include an alarm area not listed in the database. This situation may occur if the local computer does not have access to the alarm area database it needs. For example, if the alarm area database resides on a file server and the server is unavailable.

## Enabling and Disabling an Alarm Service

With the SCU, you can enable or disable any alarm service depending on your needs. Use the following table as a guide to help you determine which alarm service you should enable.

Enable the...	When you want to...
Alarm Printer Service	Print all alarms and messages.
Alarm File Service	Save all alarms and messages to a text file.
Alarm Summary Service	Display current alarms to operators.
Alarm History Service	Review the last 200 alarms and messages.
Alarm ODBC Service	Archive alarms and messages to a relational database for subsequent analysis or retrieval.
Alarm Network Service	Distribute and receive alarm and messages across your iFIX network.
Alarm Startup Queue Service	Forward to a View client the alarms and messages that have occurred on a SCADA server for a user-defined period before the client started.

## Configuring Alarm Services

Most alarm services have one or more options you can configure. For example, you can select a printer port and enter a printer description for the Alarm Printer Service. The Alarm Summary Service lets you configure how to delete acknowledged alarms. You can also assign alarm areas to most alarm services.

For more information on assigning alarm areas, refer to the section [Assigning Alarm Areas](#).

## Setting up the Alarm and Message Format

In addition to alarm areas, you can also select the alarm and message format for Alarm Printer, Alarm File, and Alarm History services. iFIX uses the common message format by default. If you want to use a different format, you can define a custom format for these services.

Creating a custom format is similar to creating a common format. For more information about the common message format, refer to the section [Defining a Common Alarm and Message Format](#).

## Configuring an Alarm Printer Service

You can configure up to four Alarm Printer Services for your nodes. For each alarm printer service, you select a printer port and enter a name in the Alarm Printer Configuration dialog box. For each printer service, you can connect the printer to serial ports (COM) 1 or 2, to parallel ports (LPT) 1 or 2, or to a USB port. Keep in mind that each printer service must be attached to a unique port, and that the printer name can be up to 32 alphanumeric characters. If you have multiple USB ports and need to specify the USB port, use the Printer.ini as described in [Specifying a USB Port with the Printer.ini File](#) section.

When configuring the Alarm Printer Service, you can also select the alarm areas and message format you want for the Alarm Printer Service. The Areas and Format buttons in the Alarm Printer Configuration dialog box provide access to these configuration items. For more information on selecting alarm areas or

the message format, refer to the sections [Assigning Alarm Areas](#) and [Setting up the Alarm and Message Format](#).

**NOTE:** If iFIX shuts down while there are still alarms waiting to be printed, the alarm printer will display an error. However, iFIX continues to close, as well as Alarm Printer Service (almprin.exe).

## Specifying a USB Port with the Printer.ini File

If you have multiple Universal Serial Bus (USB) printers connected to the same computer, the Alarm printer picks the first one it finds to print the alarm information and messages. If you want to specify the port that the Alarm Printer Service prints to, you need to update the Printer.ini file.

► To specify a USB port using the Printer.ini file:

1. Open a text editor, such as Microsoft® Notepad or Wordpad.
2. Open the Printer.ini in the C:\Program Files (x86)\GE\iFIX\Local folder.

**IMPORTANT:** If you use the application project management feature in iFIX, you must save a printer.ini into each C:\Program Files (x86)\GE\iFIX\ProjectName\LOCAL folder, where *ProjectName* is the name of a project.

3. Scroll to the following lines into the Printer.ini file:

```
;-----  
[ALARMS]  
use_print_manager=YES  
usb_port_name=USB001  
;-----
```

where *USB001* is the name of the USB printer port that you want to print to.

4. Enter the new port number.
5. Save the file. If you have multiple projects, make sure you update and save the Printer.ini for each project.
6. Restart iFIX.

## Specifying the Number of Lines to Print Per Page with the Printer.ini File

With the Printer.ini file, not only can you specify the USB port that you want to print to, you can also define the number of lines per page that you want to print.

► To create the Printer.ini file that defines the number of lines per page to print:

1. Open a text editor, such as Microsoft® Notepad or Wordpad.
2. Open the Printer.ini in the C:\Program Files (x86)\GE\iFIX\LOCAL folder.

**IMPORTANT:** If you use the application project management feature in iFIX, you must save a printer.ini into each C:\Program Files (x86)\GE\iFIX\ProjectName\LOCAL folder, where *ProjectName* is the name of a project.

3. Scroll to the following lines into the Printer.ini file:

```
;-----  
[ALARMS]  
use_print_manager=YES
```

```
use_print_manager_flush_number=YES
print_manager_flush_number=50
;-----
```

where 50 is the number of lines per page that you want to print.

4. Enter your new number of lines per page.
5. If you have multiple USB printers configured on your machine and need to specify which one to use for alarm printing, update the `usb_port_name=USB001` line in your Printer.ini file.  
In this line, *USB001* is the name of the USB printer port that you want to print to. For example, for multiple USB printers, your Printer.ini file should look similar to this:

```
;-----
[ALARMS]
use_print_manager=YES
use_print_manager_flush_number=YES
print_manager_flush_number=50
usb_port_name=USB001
;-----
```

**NOTE:** If you are not using a USB printer, you do not need the `usb_port_name=USB001` line in your Printer.ini file.

6. Save the file. If you have multiple projects, make sure you update and save the Printer.ini for each project.
7. Restart iFIX.

## Configuring the Alarm File and Alarm History Services

The Alarm File and Alarm History Services require no special configuration. You simply assign the required alarm areas and select the message format you want. When the Alarm File service receives alarms and messages, it saves them to the text file, *yymmdd.ALM*. This file resides in the Alarm path.

Be sure that the Alarm History Service is always enabled. If the Alarm History Service is disabled, you may receive an error message stating that no destination is currently available to dispatch the alarm.

iFIX automatically deletes alarm files after 30 days. If you want to change the length of time iFIX saves alarm files before deleting them, adjust the value of the `file_live_days` parameter in the ALARM.INI file. This file resides in the Local path.

Possible values for the `file_live_days` parameter range from 1 to 365 days. For example, to delete alarm files after 45 days, change the `file_live_days` parameter to the following:

```
file_live_days=45
```

When entering a value for the `file_live_days` parameter, fractional numbers are rounded down. Other values, such as non-numeric values, or numbers greater than 365 or less than 1, set the parameter's value to the default of 30 days. Deleting or moving the ALARM.INI file also sets the parameter's value to 30 days.

**CAUTION:** Do not delete the current alarm file when the Alarm File Service is enabled and iFIX is generating alarms. Doing so may cause serious problems, such as system errors or data loss.

## Configuring the Alarm ODBC Service



You can save alarms and messages for subsequent analysis or historical reference by enabling the Alarm ODBC Service. This service sends alarms and messages to an ODBC-compliant relational database, allowing you to retrieve any information you want by querying the database. You can use the iFIX ODBC Alarm Service Configuration dialog box to configure the Alarm ODBC Service.

**TIP:** For the most reliable performance, run the Alarm ODBC Service on the SCADA nodes in your application, and not on the iClients.

► **To access the iFIX ODBC Alarm Service Configuration dialog box:**

1. Click the Alarm button on the SCU toolbox. The Alarm Configuration dialog box appears.
2. Double-click Alarm ODBC Service.
3. Click Configure. The iFIX ODBC Alarm Service Configuration dialog box appears. You can enter the following information to configure the Alarm ODBC Service:
  - SQL Login Information:
    - The relational database type (for example, Oracle or SQL Server).
    - The user name and password required to connect to the relational database.
    - The ODBC data source name.

**NOTE:** If your relational database is a Microsoft Access database, the database and the Alarm ODBC Service must be on the same machine.

- Database Configuration:
  - The table name in which you want to save alarms and messages.
  - The alarm and message fields you want to archive.
  - The column names in the table you want to use.
- Options
  - The number of seconds between writes to the relational database.
  - The maximum number of records in the alarm queue.
  - The number of records to write to the relational database at one time from the AlarmQueue or the backup file.
- Lost Connection Options:
  - A path where you want to save your backup file in case of a lost connection.
  - A tag to indicate a lost connection.
- User fields for the table.

When configuring the ODBC Alarm Service, you can create your own table where you want to archive your alarms and messages. Although many databases allow table names of up to 250 characters, we recommend that you limit the table name to 100 characters or less. Using table names longer than 100 characters may cause unpredictable results.

If you have installed and configured the iFIX SQL option, you can use your existing SQL setup to specify the first three required items.

## Selecting a Table

The Alarm ODBC Service provides two options for specifying the table name: you can add any name in the Table Name field, or you can use the default table, FIXALARMS. When entering your own table name, you do not need to specify the name of an existing table. Instead, let the Alarm ODBC service create the table at run-time. You can also create the table when you configure the alarm service by clicking Create Table Now.

**NOTE:** If you are using SQL when creating a new table with the Alarm ODBC Service, you may generate an error stating that the column length is too long. Existing tables will continue to work.

When you enter your own table name, you must also select the specific alarm and message fields you want to archive using the Column Configuration spreadsheet. These fields contain the following information:

- The date of the alarm or message. The supported date format is month/day/year (mm/dd/yyyy) and is determined by the Regional Settings. The default time format is hour:minute:second.sub-second (hh:mm:ss.n). You can change this to display time down to the millisecond.
- The time that the block:
  - First generated an alarm or message.
  - Last generated an alarm or message.
- The name of:
  - The SCADA server that generated the alarm or message. If you enable logical node names in the SCU, the name of the SCADA server is the logical name you define.
  - The block (tag) that generated the alarm or message.
  - The logged in operator (included for operator messages only, when security is enabled).
  - The performing or verifying user for an action (full name, user name, and comment, when electronic signature is enabled).
  - The node name of the computer that the operator is using (included for operator messages only, when security is enabled).
- The block's current value, EGU label, alarm priority, alarm areas, description from the process database, alarm state (for example, High, Low, Deviation), and alarm extension fields. Typically, one of the alarm extension fields includes the name of the picture that shows alarms from the current block.
- The specific alarm type (for example, an alarm or a message).
- Up to 4 user-defined fields.

**NOTE:** If you want to change the fields that are in an existing table, you must create a new table with a new name, and then transfer data from the existing table to the new table. You cannot modify an existing table's fields by selecting or deselecting fields in the Column Configuration spreadsheet.

## Selecting Specific Alarm and Message Fields

Next to each field in the spreadsheet is an empty cell used to define the column name that will store the field's information in the specified table. For example, if the column name that stores the Alarm Priority is ALM\_ALMPRIORITY, enter this text as the following figure shows.

Column Configuration

Select All      Restore Defaults

iFIX Field Name	SQL Column Name
<input type="checkbox"/> Native Date/Time In	
<input type="checkbox"/> Native Date/Time Last	
<input type="checkbox"/> Logical Node Name	
<input type="checkbox"/> Physical Node Name	
<input type="checkbox"/> Tag Name	
<input type="checkbox"/> Tag Description	
<input type="checkbox"/> Value	
<input type="checkbox"/> Unit	
<input type="checkbox"/> Message Type	
<input type="checkbox"/> Message Description	
<input type="checkbox"/> Alarm Status	
<input checked="" type="checkbox"/> Alarm Priority	ALM_ALMPRIORITY
<input type="checkbox"/> Alarm Area	
<input type="checkbox"/> Alarm Ext.Field1	

↑

↓

### Fields and Column Sizes

The exact fields you archive depend on the table that saves your alarms and messages. The table must have one column for each field you select. If you select more fields than the table can save, some or all of the data will not be saved, depending on your relational database. The size of each column must be at least the size specified in the following table.

Column Sizes		
iFIX Field Name	Default SQL Column Name	Data Type (Size)
Native Date/Time In	ALM_NATIVETIMEIN	datetime
		<b>NOTE:</b> On Oracle databases, the datatype is DATE.
Native Date/Time Last	ALM_NATIVETIMELAST	datetime
		<b>NOTE:</b> On Oracle databases, the datatype is DATE.
Logical Node Name	ALM_LOGNODENAME	CHAR (10)
Physical Node Name	ALM_PHYSLNODE	CHAR (10)
Tag Name	ALM_TAGNAME	CHAR (256)
		<b>NOTE:</b> On Microsoft Access databases, the datatype is Memo.
Tag Description	ALM_TAGDESC	CHAR (256)
		<b>NOTE:</b> On Microsoft Access databases, the datatype is Memo.

Value	ALM_VALUE	CHAR (40)
Unit	ALM_UNIT	CHAR (13)
Message Type	ALM_MSGTYPE	CHAR (11)
<p><b>NOTE:</b> Message Types less than 11 characters in length use hard-coded trailing spaces to make up the difference. For instance, the "ESIGNATURE " Message Type includes a space at the end, and the "DELETE " message type includes five trailing spaces. See the Message Types and Message Type Query Syntax sections below for further information and a list of Message Types.</p>		
Message Description	ALM_DESCR	CHAR (480)
<p><b>NOTE:</b> On Microsoft Access databases, the datatype is Memo.</p>		
Alarm Status	ALM_ALMSTATUS	CHAR (9)
Alarm Priority	ALM_ALMPRIORITY	CHAR (10)
Alarm Area	ALM_ALMAREA	CHAR (500)
<p><b>NOTE:</b> On Microsoft Access databases, the datatype is Memo.</p>		
Alarm Ext.Field1	ALM_ALMEXTFLD1	CHAR (79)
Alarm Ext.Field2	ALM_ALMEXTFLD2	CHAR (79)
Operator Login User Name	ALM_OPNAME	CHAR (32)
Operator Login Full Name	ALM_OPFULLNAME	CHAR (80)
Operator Node Name	ALM_OPNODE	CHAR (10)
Performed By User Name	ALM_PERFNAME	CHAR (32)
Performed By Full Name	ALM_PERFFULLNAME	CHAR (80)
Performed By Comment	ALM_PERFBYCOMMENT	CHAR (170)
Verified By User Name	ALM_VERNAME	CHAR (32)
Verified By Full Name	ALM_VERFULLNAME	CHAR (80)
Verified By Comment	ALM_VERBYCOMMENT	CHAR (170)
Message ID	ALM_MSGID	unique identifier
<p><b>NOTE:</b> On Oracle databases, the datatype is</p>		

		CHAR (128). On Microsoft Access databases, the datatype is Number (Replication ID).
Date In	ALM_DATEIN	CHAR (12)
Time In	ALM_TIMEIN	CHAR (15)
Date Last	ALM_DATELAST	CHAR (12)
Time Last	ALM_TIMELAST	CHAR (15)
User Field1	ALM_USERFLD1	CHAR (80)
User Field2	ALM_USERFLD2	CHAR (80)
User Field3	ALM_USERFLD3	CHAR (80)
User Field4	ALM_USERFLD4	CHAR (80)
Alarm Shelvable	A_ALMSHLVENAB	CHAR (10)
Alarm Shelved	A_ALMSHELVED	CHAR (10)
Rem Shelf Duration	A_ALMSHELFREMTIME	CHAR (30)

You must also set up your relational database to accept null strings. Consult your relational database manuals to learn how to enable this feature.

**IMPORTANT:** Do not use reserved SQL keywords as column or table names. Doing so can result in data loss. For a list of reserved keywords, consult your SQL manuals.

**NOTE:** If you want to change the fields that are in an existing table, you must create a new table with a new name, and then transfer data from the existing table to the new table. You cannot modify an existing table's fields by selecting or deselecting fields in the Column Configuration spreadsheet.

## Message Types

The following Message Types can be generated in an alarm message:

Message Types		
Message Type	SQL Column Name	Description
UNKNOWN	ALM_MSG_UNKNOWN	Unknown type of message
ALARM	ALM_MSG_ALM	Typical alarm (e.g. block alarms)
HARDWARE	ALM_MSG_HARDWARE	Hardware I/O alarm
NETWORK	ALM_MSG_NETWORK	Network notification
SYSALERT	ALM_MSG_SYSTEM_ALERT	System alert notification
USER	ALM_MSG_USER	User-defined message
ACKNOWLEDGE	ALM_MSG_FLAG_ACK	Acknowledgement notification
DELETE	ALM_MSG_FLAG_DEL	Manual delete notification
OPERATOR	ALM_MSG_OPERATOR	Operator action
RECIPE	ALM_MSG_RECIPE	Recipe message
EVENT	ALM_MSG_EVENT	Event message
TEXT	ALM_MSG_TEXT	Generic text message
6XTXT	ALM_MSG_TEXT_6X	Generic or unknown message from v6.x nodes
AAM	ALM_MSG_AAM	Auto Alarm Manager message
SQL	ALM_MSG_SQL	SQL messages
ESIGNATURE	ALM_MSG_SIGNED	Electronic Signature

## Message Type Query Syntax

The Message Type field is 11 characters in length. If a Message Type contains less than 11 characters, hard-coded trailing spaces are included to make up the difference.

For example, in this statement, the extra characters explicitly appear at the end of the DELETE string:

```
SELECT * FROM FIXALARM WHERE (FIXALARM.ALM_MSGTYPE = 'DELETE      ').
```

Alternatively, this example demonstrates the use of wildcards to make the statement more generic:

```
SELECT * FROM FIXALARM WHERE (FIXALARM.ALM_MSGTYPE Like '%DELETE%').
```

In addition, a query statement like the following example will also return matches:

```
SELECT * FROM FIXALARM WHERE (FIXALARM.ALM_MSGTYPE = 'DELETE').
```

nag

## Using the Default Table

While you can configure the Alarm ODBC Service with table and column names of your choosing, doing so can be time-consuming and error-prone. A simpler, faster, and easier way to specify a table for the service is to use the default table name, FIXALARMS. This table contains the following columns:

**FIXALARMS Default Columns**

iFIX Field Name	Default SQL Column Name	Data Type (Size)
Native Date/Time In	ALM_NATIVETIMEIN	datetime
Native Date/Time Last	ALM_NATIVETIMELAST	datetime
Logical Node Name	ALM_LOGNODENAME	CHAR (10)
Tag Name	ALM_TAGNAME	CHAR (256)
Value	ALM_VALUE	CHAR (256)
Unit	ALM_UNIT	CHAR (13)
Message Type	ALM_MSGTYPE	CHAR (11)
Message Description	ALM_DESCR	CHAR (480)

		<b>NOTE:</b> On Microsoft Access databases, the datatype is Memo.
Alarm Status	ALM_ALMSTATUS	CHAR (9)

**NOTE:** You can adjust the width of any column in the FIXALARMS table with your relational database software. Refer to your relational database documentation for more information.

When you use the default table name, the Alarm ODBC Service completes the Column Configuration spreadsheet for the columns listed in the previous table, thereby simplifying the setup. Similarly, when you create the table by clicking Create Table Now, the service simplifies its configuration again.

**NOTE:** If you want to change the fields that are in the default table, you must create a new table with a new name, and then transfer data from the existing table to the new table. You cannot modify the default table's fields by selecting or deselecting fields in the Column Configuration spreadsheet.

## Configuring the Update Interval and Backup Path

One configuration option the Alarm ODBC Service provides is the update interval. This option controls how often to check for alarms. The service checks for alarms every 1 second by default; however, you can enter any interval from 1 to 300 seconds.

You can also define an optional backup file for the Alarm ODBC Service. The service saves alarms and messages to this file if it cannot access the relational database. The file, ALMODBC.TMP, resides in the Alarm path. When the relational database re-establishes contact with the Alarm ODBC Service, iFIX automatically reads the data in the temporary file to update the relational database.

## Pausing Alarms

At run-time, operators can monitor the status of the Alarm ODBC Service with the Alarm ODBC tab in Mission Control. This tabbed page tracks:

- The number of alarms and messages written to the relational database.
- The number of times the service connected to and disconnected from the relational database.
- Whether the Alarm ODBC Service is connected and logged into the relational database.

The Alarm ODBC tab also lets you pause alarming when you enable it in the Alarm ODBC Service. Typically, you pause alarms when you are testing and debugging your system. While alarming is paused, the Alarm ODBC Service does not send data to the relational database and does not save the alarms that occur.

**CAUTION:** To prevent alarm loss, do not pause alarming unless absolutely necessary.

For more information on the Alarm ODBC tab in Mission Control, refer to the section [Viewing Alarm ODBC Information](#) in the Setting up the Environment manual.

## Configuring the Alarm ODBC Service Queue

The Alarm ODBC Service stores the alarms it receives to an alarm queue prior to sending them to your relational database. By default, the queue holds 100 alarms. You can increase the size of the queue by

entering a new value, up to 32767, in the Alarm Queue Size field. By increasing the queue size, you can prevent alarm loss.

## Running the Alarm ODBC Service as a Service Under Windows

You can run iFIX as a service under Windows. When you do this, you can log out of the operating system without shutting down iFIX. This provides a much higher level of security to your process, because operators can log in and log out of a node before and after their shift without affecting the process.

If you run iFIX as a service, you need to run the Alarm ODBC Service the same way. You can accomplish this by configuring a system data source in your ODBC control panel. To learn how to configure a system data source, refer to the section [Running iFIX ODBC as a Service](#) in the Using SQL manual.

**NOTE:** For 64-bit operating systems, use the 32-bit ODBC Administrator tool, `odbcad32.exe`, in the `SysWOW64` folder to set up your ODBC data source. By default, this tool is found in the following location: `%systemroot%\SysWOW64\odbcad32.exe`. This path is normally: `C:\Windows\SysWOW64\odbcad32.exe`. For more information, refer to the following Microsoft KB article: <http://support.microsoft.com/kb/942976>.

## Creating an Alarm ODBC Watchdog Using the Scheduler

If you want to create a watchdog using the Scheduler, to monitor the status of the Alarm ODBC connection, use the following custom code in your Timer entry. For each case, substitute [...] with the actual action you want to take:

```
Private Declare Function GetAlarmODBCStatus Lib "MissionVBA.dll" () As Integer

Private Sub FixTimer3_OnTimeOut(ByVal lTimerId As Long)
Dim IntODBCstatus As Integer
    IntODBCstatus = GetAlarmODBCStatus
Select Case IntODBCstatus
Case 0
    ' connecting
    [...]
Case 1
    ' not connected
    [...]
Case 2
    ' connected
    [...]
Case 3
    'connection lost
    [...]
End Select
End Sub
```

It is recommended that you run your Time-based entry at an interval of 20 seconds in order to get accurate data, since the time-out for the SQL connection is about 60 seconds.

Unlike the Tag field in the Lost Connections area of iFIX ODBC Alarm Service Configuration dialog box, this example allows you to create a watchdog to monitor the status and report back on it.

## Configuring the Alarm Network Service



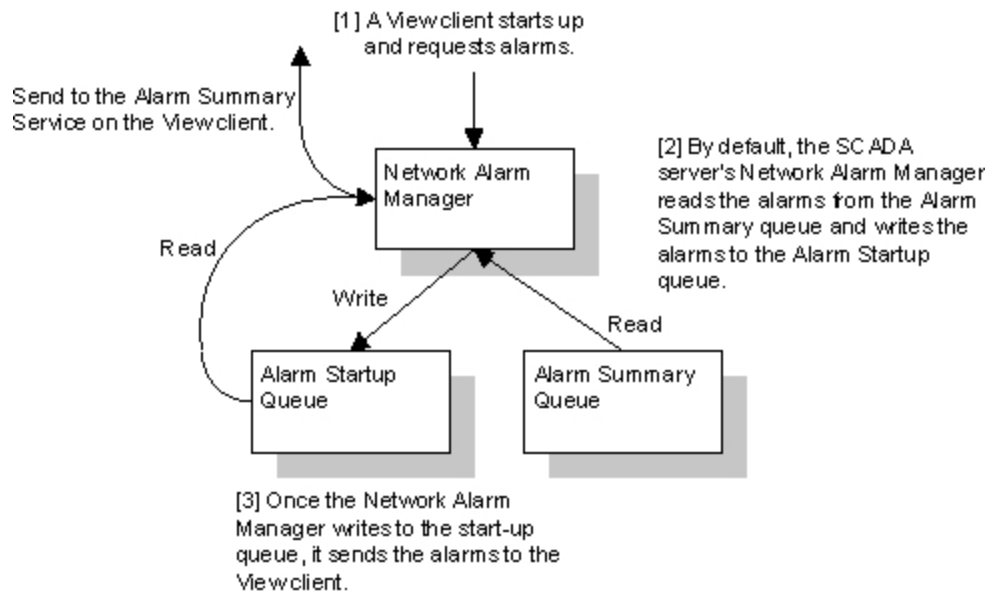
Unlike other alarm services, you do not assign alarm areas to the Alarm Network Service when you configure it because this service routes alarms and messages to your nodes. Among the routed alarms are the start-up alarms. The Alarm Network Service routes these alarms to View client's Alarm Summary Service by default when you enable the Alarm Startup Queue Service. As an option, you can configure the Alarm Network Service to send start-up alarms to all of the client's enabled alarm destinations. This feature lets you print the start-up alarms or save them to an alarm file. One side effect of using this configuration is that the View client receives duplicate alarms.

If your system is networked, be sure that the Alarm Network Service is always enabled. If the Alarm Network Service is disabled, you may receive an error message stating that no destination is currently available to dispatch the alarm.

**NOTE:** If the local computer does not have a configured session with a remote SCADA server, the local computer does not receive alarms or messages from the remote SCADA server.

## Configuring the Alarm Startup Queue Service

The Alarm Startup Queue Service provides a View client with a list of the alarms that occurred on a SCADA server prior to starting iFIX on the View client. The following figure shows how the server and client interact on start-up.



### *Alarm Start-up Queue*

In addition, iFIX can send messages to the Alarm Startup Queue Service along with the alarms. When you do this, the SCADA server copies the alarms and messages from its Alarm Summary and Alarm History Services.

The Alarm Startup Queue Service also lets you filter the alarms and messages received by time. Once you enable the filter, the SCADA server only copies the alarms and messages that are more recent than the time you specify. For example, you can filter out alarms and messages that are over 12 hours old by entering **12** in the Hours field and **00** in the Minutes field.

If you are using the Startup Queue, be sure to enable the Alarm Summary Service. If the Alarm Summary Service is disabled, you can still configure the Startup Queue in the SCU. However, startup alarms (boot queue) are not sent.

## Configuring the Alarm Summary Service

By default, the Alarm Summary Service automatically deletes an acknowledged alarm when the block's current value returns to normal. If you do not want to delete acknowledged alarms automatically, you can disable this feature and delete the alarms manually by re-acknowledging them after the block's value returns to normal.

For more information on acknowledging alarms, refer to the section [Acknowledging Alarms](#).

## Configuring the Frequency of Alarm Cycles

In iFIX, you can throttle the frequency of alarm cycles by configuring the `AsynchDispatchThread` setting in the `Alarm.ini` file. This setting configures the thread processing speed - the speed at which the thread moves alarms from the Scan, Alarm, and Control program (SAC) asynchronous queue to the Alarm Summary Queue.

You can find the `Alarm.ini` configuration file in the iFIX Local folder. If you installed iFIX to the default location, this folder is: `C:\Program Files (x86)\GE\iFIX\LOCAL`. The `AsynchDispatchThread` setting can be set anywhere from A1 to A25. A1 indicates the alarm cycle is 500ms between alarm cycles. The default is A1. A25 indicates the alarm cycle is 500ms/25ms (or 20ms). The following is an example of the section of the `Alarm.ini` file that contains the setting to edit:

```
[ALARMCYCLES]
;
;   AsynchDispatchThread
;   Change the AsynchDispatchThread processing speed.
;   In order to use this feature, change the value to
;   something between A1 and A25
;   Default can be A1 (500ms between alarm cycles) or no entry here.
;   For example, A25 (500ms/25ms), it would be Sleep(20) between alarm cycles.
AsynchDispatchThread = A1
```

## Understanding the Alarm Area Database

Each process database you create references an alarm area database in order to determine the available alarm areas. As a result, before a SCADA server can load its process database, it must locate the associated alarm area database. This means that an alarm area database must exist before you can create your process database.

By default, iFIX supplies the alarm area database `ALARMAREAS.AAD`. The file resides in the Alarm Areas path and defines alarm areas A through P. You can modify these alarm areas or add new ones, depending on your needs. By naming all the alarm areas that each SCADA server requires, you create an alarm area database. To learn more about creating alarm areas, refer to the section [Defining Alarm Areas](#).

iFIX also creates a backup copy of the alarm area database. Whenever a SCADA server starts up, iFIX copies the alarm area database to the Local path. The SCADA server uses the backup alarm area database if the original alarm area database is unavailable.

### Sharing Alarm Area Databases

You can create one alarm area database for each SCADA server, or you can share the AAD file among multiple computers by copying the file to each SCADA server that requires it. Sharing a file in this way is useful when two or more SCADA servers need the same set of alarm areas.

### Changing AAD Files

As you add more iFIX nodes to your network, you may find maintaining multiple local copies of the alarm area database time-consuming. To simplify your configuration, you can create one master alarm area database and move it to a file server. Sharing the alarm area database in this manner provides:

- A fast and easy way to change alarm area names system-wide.
- A global set of alarm areas at your site.

Once you do this, you must change your process databases to reference the master AAD file.

#### ► To change your process databases to reference the master AAD file:

1. Export each process database.
2. Change the Alarm Areas path on each SCADA node to reference the network path to AAD file on your file server.
3. Import the local process database.

### Alarm Area Database Mismatch

Each Process Database (PDB) file in iFIX has an associated Alarm Area Database (AAD) file. Whenever a PDB file is being loaded, whether at iFIX startup or at runtime, the PDB will attempt to locate its associated AAD file. If the AlarmAreas.AAD file is not the matching AAD, the following message appears:

Alarm Area Database Mismatch. If you continue, block alarm area assignments may not be valid. This database cannot be saved. Locate the AlarmAreas.AAD file for this PDB and install it into the AADPATH.

If you continue by clicking OK, all alarm areas in all blocks will be changed to "ALL". Also, you will not be able to save the database because any custom areas will be lost.

To avoid this problem, do either of the following:

- Locate the correct AAD file and copy it to AlarmAreas.AAD.
- Export the PDB to a CSV file, change the alarm areas in the exported CSV file, and import the new CSV file into an empty database.

## Displaying Alarms in Pictures

Even the best-configured alarm system can be enhanced by creating pictures that display alarms to operators. iFIX provides the following options for creating pictures that display alarms:

- Data links displaying the alarm status of individual blocks. These links appear as text fields into which the operator can enter data. For more information on adding Data links to pictures, refer to the section [Adding Data Links to Pictures](#).
- Objects animated by alarms. This option changes a property of an object when an alarm occurs, such as the object's color. For more information, refer to the section [Animating Objects by Alarm](#).
- Alarm Summary objects. These objects provide a real-time view of the alarms received by the local computer. Using an Alarm Summary object, operators can respond to alarms quickly and efficiently. For more information on adding an Alarm Summary object to a picture, refer to the section [Adding the Alarm Summary Object to a Picture](#).

### Adding Data Links to Pictures

You can display alarms for individual blocks by adding Data links to your pictures. Once you add a Data link, you can define its data source by referencing an iFIX tag. You can also reference an OPC server; however, the OPC specification does not support alarms. For more information about the OPC specification, you can visit their web site at <http://www.opcfoundation.org>.

### iFIX Tag Syntax

You can reference a tag with the syntax:

```
Fix32.nodename.blockname.fieldname
```

where *nodename* is a SCADA server, *blockname* is the block you want to monitor, and *fieldname* the process value you want to display. For example, to display the current alarm for the Analog Input block, AI\_TEMP16, on the SCADA server, MIXER1, use the data source:

```
Fix32.MIXER1.AI_TEMP16.A_CUALM
```

The following table lists other common alarm fields that you can reference. For more information about block fields, refer to the [Building a SCADA System](#) manual. For a list of available servers, blocks, addresses, and fields, use the Expression Builder. You can learn more about the Expression Builder by referring to the [Creating Pictures](#) manual.

Common Alarm Fields

The field...	Displays...	Valid Entries
A_ALMEXT1	The text entered in the block's alarm extension fields.	Up to 79 characters.
A_ALMEXT2		
A_ALMINTIME	The time and date at which the block generated the alarm. Depending on your configuration, the time and date may be the OPC server time or the local computer time. Refer to the section <a href="#">Understanding Time Stamps</a> to learn more	N/A. This is a display-only field.

A_	about how iFIX time-stamps alarms.	
ALMLASTTIME	The time and date at which the block last generated an alarm. Depending on your configuration, the time and date may be the OPC server time or the local computer time. Refer to the section <a href="#">Understanding Time Stamps</a> to learn more about how iFIX time-stamps alarms.	N/A. This is a display-only field.
A_ALMSN	The serial number of the alarm area database.	N/A. This is a display-only field.
A_AREA1 through A_AREA15	The block's alarm areas.	ALL or any alarm area name defined in the alarm area database.
A_CUALM	The block's current alarm status.	Analog blocks display alarms such as High, Low, Rate of Change, or Deviation. Digital blocks display alarms such as Change of State or Change from Normal.
A_ENAB	Whether or not the current block can generate alarms. Use this field to enable and disable alarming as needed.	Yes or 1, if the block can generate alarms, or
F_ENAB		No or 0, if the block cannot generate alarms.
A_EVENT	Whether the current block can generate event messages. Use this field to enable or disable event messaging.	Enable, if the block can generate event messages, or
		Disable, if the block cannot generate event messages.
A_IENAB	Whether the current block can generate alarms on start-up.	<ul style="list-style-type: none"> <li>• Enable, if the block generates alarms on start-up, or</li> <li>• Disable, if the block does not generate alarms on start-up.</li> </ul>
A_LAALM	The block's most severe unacknowledged alarm, called a <i>latched alarm</i> .	Analog blocks display alarms such as High, Low, Rate of Change, or Deviation. Digital blocks display alarms such as Change of State or Change from Normal.
A_NALM	Whether or not the current block has any unacknowledged alarms.	Yes or 1, if the block has unacknowledged alarms, or
F_NALM		No or 0, if all the alarms are acknowledged.
A_OPCLIMIT	The hardware options of the OPC server.	N/A. This is a display-only field.
A_OPCLTY	The quality status of the OPC server.	N/A. This is a display-only

A_	The quality substatus of the OPC server.	field.
OPCSUBSTAT		N/A. This is a display-only field.
A_OPCTIME	The time and date from the OPC server. If no OPC server is available, the field contains the local computer time.	N/A. This is a display-only field.
A_PRI	The block's alarm priority.	INFO, LOLO, LOW, MEDIUM, HIGH, HIHI, or CRITICAL.

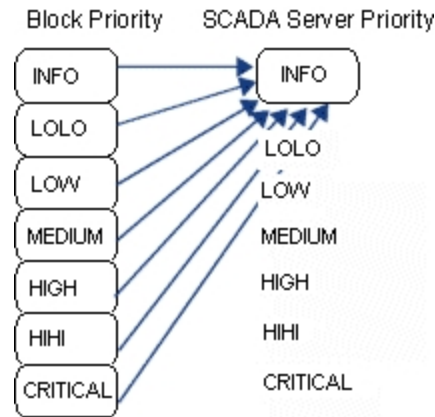
To display and change a block's alarm limits, use the fields in the following table.

Block-Specific Alarm Fields		
The field...	Displays...	Valid Entries
A_HI F_HI	The High alarm limit for an Analog Alarm or Analog Input block.	Depends on the block's EGU range. By default, the range is 0 to 100.
A_LO F_LO	The Low alarm limit for an Analog Alarm or Analog Input block.	Depends on the block's EGU range. By default, the range is 0 to 100.
A_LOLO F_LOLO	The Low Low alarm limit for an Analog Alarm or Analog Input block.	Depends on the block's EGU range. By default, the range is 0 to 100.
A_HIHI F_HIHI	The High High alarm limit for an Analog Alarm or Analog Input block.	Depends on the block's EGU range. By default, the range is 0 to 100.
A_ROC F_ROC	The rate-of-change alarm limit for an Analog Alarm or Analog Input block.	Depends on the block's EGU range. By default, the range is 0 to 100.
A_DBAND F_DBAND	The deadband for an Analog Alarm or Analog Input block.	Depends on the block's EGU range. By default, the range is 0 to 100.
A_ALMCK	The type of alarms generated by a Digital Alarm or Digital Input block.	None, Open, Close, or Change of State.

For more information on Data links and entering a data source, refer to the [Creating Pictures](#) manual.

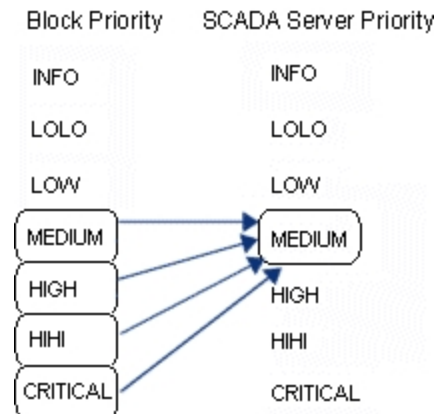
## Changing a SCADA Server's Alarm Priority Filter

Each SCADA server uses its alarm priority to determine which alarms it sends to its View clients. Only alarms of equal or greater priority are sent by the server. For example, as the following figure shows, when the node's alarm priority is INFO, iFIX reports all alarms to the enabled alarm destinations on the computer.



### Using the Alarm Priority Filter

However, as the next figure shows, when the node's alarm priority is MEDIUM, iFIX reports only alarms with a MEDIUM, HIGH, HIHI, or CRITICAL priority. INFO, LOLO, and LOW priority alarms are automatically acknowledged and filtered out. Consequently, iFIX never routes these alarms to your alarm destinations; however, INFO, LOLO, and LOW priority alarms do appear in Data links configured to show latched and current alarms.



Automatically acknowledging INFO, LOLO, and LOW priority alarms does not change your process database in any way. For example, the THEN/ELSE statements in an Event Action block still respond to alarm conditions. Likewise, in the Analog Alarm and Digital Alarm blocks, an automatically acknowledged alarm is treated as if the operator acknowledged it. This means that if the associated contact is set to clear on Acknowledge, it opens when the alarm is acknowledged. Contacts set to clear in All Clear mode open when the block value falls within the defined limits. For more information on all database blocks, refer to the [iFIX Database Reference](#).

You can change a SCADA server's alarm priority by creating a Data link that references the internal system field A\_SACPR as follows:

```
Fix32.node.System.A_SACPR
```

For more information using internal system fields as a data source, refer to the [iFIX Database Reference](#).

## Animating Objects by Alarm

Objects animated by alarm let you create easy-to-use pictures and provide visual cues for operators about new alarm conditions. For example, you could color a tank red if a High alarm occurs. On a High alarm, you could also enlarge the size of the tank.

► **To animate an object:**

1. In Classic view, select an Expert on the Experts toolbar.  
-Or-  
In Ribbon view, in the Animations group, click Animations, and then click the desired Expert.  
-Or-  
If you have the Toolbox enabled, select the Expert from the Toolbox.
2. Complete the dialog box that appears.

Among the information you must enter is the data source you want to use. This data source defines the iFIX tag you want to monitor.

When you specify an existing data source, the table in the lower part of the dialog box updates so you can select the colors you want to associate with each alarm. The following table lists the valid alarm states for analog and digital blocks:

Valid Analog Alarm States	Valid Digital Alarm States
OK	CFN (Change from Normal)
LOLO	COS (Change of State)
HIHI	
LO	
HI	
RATE (Rate of Change)	

When you enter a nonexistent data source, the table does not update and displays numeric values at the start of the table. To fix this, enter a valid data source to display the table (you can also Quick-Add the data source) or, using the nonexistent data source, edit the color threshold table using the desired alarming values and colors.

For more information about alarm states, refer to the [iFIX Database Reference](#).

### **Latched Alarms vs. Current Alarms**

iFIX provides two database fields to use when selecting the data source, latched alarms (A\_LAALM) and current alarms (A\_CUALM). Each field differs in how it handles multiple alarm states. If, for example, you are animating the foreground color property, the current alarm field always displays the color assigned to the current alarm. The latched alarm field displays the color assigned to the most severe unacknowledged alarm. If no unacknowledged alarms exist, the field displays the color of the current alarm. For more information on how these alarm fields handle multiple alarm states, refer to the section [Multiple Alarm Acknowledgment](#).

### **Example: Animating Objects by Alarm**

Typically, animated objects reference the latched alarm field when you want operators to respond to unacknowledged process values that are too high or too low. For example, suppose you want to change the foreground color of an oven as follows:



When this alarm occurs...	Color the oven...
High High	Red
High	Orange
Low	Yellow
Low Low	Blue

With this information, you can select the Animate Foreground Color Expert and complete the following dialog box as shown below:

Receive Foreground Color from

Data Source:

Color Properties | Historical Properties

Color By

☐ Current Value ☒ Latched Alarm

☐ Current Alarm

New Alarm

☒ Blink on New Alarm

☐ Blink on New Alarm Color

Foreground Color Threshold

☐ Range ☒ Exact Match Exact Match Tolerance:

Alarm Value	Color	Blink To
HIHI	Red	None
HI	Orange	None
LO	Yellow	None
LOLO	Blue	None
Deviation	Blue	None

☐ Use Shared Threshold Table

Shared Table:

No Blink

Insert Row

Delete Row

Reset To Defaults

Get Data From New Selection OK Cancel Help

### Completing the Foreground Color Expert

For more information on using Experts and animating objects, refer to the [Creating Pictures](#) manual.

## Toggling Values Dynamically

Using the field F\_NALM, you can dynamically toggle values in animated objects when a new unacknowledged alarm occurs. This feature lets you change the visibility of an object. For example, suppose

you want to dynamically change the visibility of an object so that it appears when a new acknowledged alarm occurs. By selecting the Animate Visibility Expert, you can complete the following dialog box as shown.

Visibility Expert

Visibility Data Source

Data Source: Fix32.FIX.TEST.F\_NALM > 0

Visibility Properties | Historical Properties

Condition for Visibility

Condition: < Condition Value:

Tolerance: 0

Condition Expression

View Visibility Condition When Fix32.FIX.TEST.F\_NALM > 0 < ?}0, RoundR

OK Cancel Help

*Completing the Visibility Expert dialog box*

For more information on using Experts and animating objects, refer to the [Creating Pictures](#) manual.

## Understanding the Alarm Summary Object

Providing visual cues to operators is the key to developing good operator displays. One way to provide these cues is to animate objects based on alarms. Another powerful way to do this is to add an Alarm Summary object to a picture. This object lets operators select, acknowledge and delete multiple alarms, sort and filter alarms, and enable, disable, and silence the Alarm Horn. You can also use the Alarm Summary object to color-code alarms by alarm status and priority to provide visual cues to your operators.

The alarm summary object contains text and color indicators that display the state of the Alarm Summary object. The default colors are Green = Run, Yellow = Pause, and Red = New Alarms. This indicator is located to the far right in the summary status bar. You can also configure the indicators to blink, and change colors and blink states through the Color property page in the AlmSumOCX user interface.

If you select multiple alarms, the alarm summary object pauses, and no new alarms come in. Any subsequent deletes, acknowledgements, or deselections automatically resumes the alarm summary. However, if you manually pause the alarm summary first, regardless of the subsequent action, the alarm summary will not resume. You must manually resume the alarm summary.

By default, the Alarm Summary object displays unacknowledged and acknowledged block alarms. When a block's value returns to normal and the alarm has been acknowledged, the Alarm Summary Service automatically deletes the alarm. The Acknowledge column is frozen so that it is always the left-most column. This allows the operator to always see the acknowledgement state, even when they have used the scroll bars to view the right-most column.

## Adding the Alarm Summary Object to a Picture

Before you add an Alarm Summary object to a picture, verify that the Alarm Summary Service is enabled in the SCU. If you want to receive alarms from the network, also verify that:

- The Alarm Network Service is enabled on the local computer and any remote nodes from which you want to receive alarms.
- Your computer has established sessions with your remote nodes.

Once you complete these tasks, you can add an Alarm Summary object to a picture by selecting the Alarm Summary button from Shapes toolbar (Classic view) or by selecting Alarm Summary from the Objects/Links list, in the Objects/Links group, on the Insert tab (Ribbon view). If the Toolbox is enabled, click the button on the Toolbox.

## Configuring the Alarm Summary Object

You can configure the Alarm Summary object by double-clicking it and displaying the object's property sheet. This property sheet lets you configure the object's filter, sort, and color properties, its appearance, and its run-time behavior. You can also save the object's current settings and reset these settings back to their preset values.

Refer to the following sections for information on using the Alarm Summary object:

- [Filtering Alarms](#)
- [Sorting Alarms](#)
- [Coloring Alarms](#)
- [Changing the Appearance of an Alarm Summary Object](#)
- [Configuring for Run-time](#)
- [Saving Settings and Resetting Defaults](#)
- [Working with the Alarm Summary Object](#)

## Filtering Alarms

One of the most powerful features that the Alarm Summary object provides is the ability to filter alarms. By filtering alarms, you can route alarms to specific Alarm Summary objects, eliminate INFO, LOLO, and LOW priority alarms, or insignificant alarms, and focus the operator's attention to the most severe or important alarms.

For example, you could filter on all HIGH, HIHI, and CRITICAL priority alarms or route alarms from a specific alarm area to one Alarm Summary object. Using OLE Automation, you can also build a display to temporarily change the Alarm Summary filters at run-time based on specific process conditions. For more information on adjusting the Alarm Summary filters, refer to the [Writing Scripts](#) manual.

In order for the Alarm Summary object to filter alarms, you must create a *filter condition*. This condition defines the alarms you want to display. After you create the condition, the Alarm Summary object displays the alarms that match the selected criteria.

### Creating Filters

You can create a filter condition by selecting a column from the object's spreadsheet that you want to filter on, a value, and a relational or comparison operator. The exact type of operator depends on the selected column. The following table lists the relational and comparison operators you can select.

Relational Operators	Comparison Operators
Equal to	Containing, =
Not equal to	Not Containing, < >
Greater than	Containing only, >
Less than	In, <
Greater than or equal to	NotIn, > =
Less than or equal to	In, < =

For example, suppose you want to display all the alarms with an alarm priority of HIGH.

► To display all alarms with an alarm priority of HIGH:

1. Display the Filter tab and select the priority column.
2. Select the relational operator Equal to.
3. Select the value HIGH.

When you do this, the Alarm Summary object adds the following condition to the bottom of the Filter tab:

```
Priority = "HIGH"
```

### Using Comparison Operators

Comparison operators let you determine if an alarm is from a specific alarm area or SCADA server. The following table lists several sample filters.

The filter...	Displays alarms...
Area In "LA-Line1"	From the alarm area LA-Line1.
Area NotIn "LA-Line1"	From any alarm area except LA-Line1.
Node In "MIXER1"	From the SCADA server MIXER1.
Node NotIn "MIXER1"	From any SCADA server except MIXER1.

You can also use comparison operators to determine if the alarm contains specific text in its description column. For example, the following filter displays alarms from any block with the text "Tank" in its Description field:

```
Description Containing "Tank"
```

This includes descriptions such as:

- Oil Tank
- Tank 5
- Green Tank with Valve

The Containing Only operator, on the other hand, finds an exact match. For example, if you want to only display alarms from Pump5, you would use the following filter:

```
Description ContainingOnly "Pump5"
```

### Creating Multiple Filters

You can combine multiple filter conditions together. As you create each condition, the Alarm Summary object automatically places the boolean operator AND before the new filter condition and appends the new condition to the existing one.

If you want to change the boolean operator, you can replace it with either the OR operator or the NOT operator.

**NOTE:** The Alarm Summary object supports up to nine filter conditions.

## Sorting Alarms

Another powerful feature of the Alarm Summary object is the ability sort the alarms that appear in the object. You can sort alarms by the following attributes in either ascending or descending order:

### The attribute... Sorts alarms by...

Time In	The time the alarm first occurred.
Block Type	The block type. For example: AI, AO, DI, DO.
Tag	The block's name.
Priority	The alarm priority, as defined for each block in the process database (low, medium, or high).
Node	The node name where the alarm originated. The sort by node option is based on the order the nodes appear in the network list in the SCU.
Ack/Time	Acknowledgment and then by time in. When sorting alarms in descending order, unacknowledged alarms appear before acknowledged alarms.
Ack/Priority	Acknowledgment and then by priority. When sorting alarms in descending order, unacknowledged alarms appear before acknowledged alarms.

## Shelving Alarms

To view whether alarms are shelveable in the Alarm Summary object in the iFIX WorkSpace, you first need to add the alarm shelving columns to your Alarm Summary display. From the Alarm Summary Configuration, select the Column tab. Move the Shelveable and Shelve Duration (HHH:MM) columns to the Selected Columns list as shown in the following figure and click Apply.

If you want to view only the shelved alarms in the Alarm Summary object, make a copy of your Alarm Summary object. On the Filter tab, select Display only Shelved Alarms and click Apply, as shown in the following figure. This will allow you to view alarms as you move them between the active alarm list and the shelved alarm list.

For more information about enabling alarm shelving for specific block types and creating alarm policies, refer to the iFIX Database Reference.

## Coloring Alarms

With the Alarm Summary object, you can create a custom alarm color scheme that provides visual cues for operators. You create the color scheme by selecting foreground and background colors. The foreground color determines the color of the alarm text and can be driven by either the alarm status or alarm priority. When Color By Status is selected, the color of the alarm text varies with the type or status of the alarm. For example, you could specify magenta text for HI (HIGH) alarms, red text for HIHI (High High) alarms, and green text for OK alarms. When Color By Priority is selected, the color of the alarm text varies with the priority of the alarm. For example, LOW, LOLO, and INFO priority alarms could have white text, MEDIUM priority alarms could have green text, HIGH, HIHI, and CRITICAL priority alarms could have red text. Or, you can configure all unacknowledged alarms to display in red and all acknowledged alarms in black.

The background color determines the color of the area the alarm text is displayed on and can also be driven by either alarm status or alarm priority. When Color By Status is selected, the background color of the alarm varies with the type or status of the alarm. For example, LOW, LOLO, and INFO priority alarms could have a white background, MEDIUM priority alarms could have a green background, HIGH, HIHI, and CRITICAL priority alarms could have a grey background. By combining the foreground and background colors, you can create a very effective display. For example, red text on grey background makes locating HIHI alarms very easy.

You also have the option to configure the font of the alarm text in the Alarm Summary object. By default, the font is 10 point Arial. By clicking the Font button for each alarm, you can select text's typeface and style. To change the font size, use the object's Properties window.

## Changing the Appearance of an Alarm Summary Object

The Alarm Summary object appears as a small spreadsheet. You can change the spreadsheet's appearance by enabling or disabling its display and column properties. The display properties show or hide the object's column headings, status bar, row numbers, scroll bars, and border. Display properties also let you configure a row to flash when displaying unacknowledged alarms.

The column properties determine which columns to display and in what order. By default, the Alarm Summary object displays the following columns:

The column...	Displays...
Ack	A check mark to indicate that the alarm is acknowledged.
Time In	The time that the block first generated the alarm. The Alarm Summary object formats the time according to the computer's Regional Settings control panel.
Time Lst	The time that the alarm condition or status last changed. If the block generating the alarm re-issues it, this time will differ from the Time In value. The Alarm Summary object formats the time according to the computer's Regional Settings control panel.
Node	The name of the SCADA server that generated the alarm.

Tagname	The name of the tag that is in alarm.
Status	The block's latched alarm.
Value	The block's current value.
Description	The block's description field.

To these columns, you can add the following:

The column...	Displays...
Area	The block's alarm areas.
Date In	The date when the block first generated the alarm. By default, date format is month/day/year (mm/dd/yyyy) and is determined by the Regional Settings control.
Date Last	The date when the block last generated the alarm. By default, date format is month/day/year (mm/dd/yyyy) and is determined by the Regional Settings control.
Priority	The block's alarm priority.
Alarm Extension	The block's alarm extension fields. Typically, the first extension field contains the name of the picture that displays information about the block. By adding the following script, you can let operators display this picture when they double-click the Alarm Extension column at run-time:
	<pre>Private Sub AlarmSummaryOCX1_LMouseDown(ByVal Col As Long, ByVal Row as Long) Dim strSelectedAlarmExt1\$ Dim strSelectedAlarmExt2\$ AlarmSummaryOCX1.GetSelectedAlmExt strSelectedAlarmExt1\$, strSelectedAlarmExt2\$ If strSelectedAlarmExt2\$ &lt;&gt; "" Then OpenPicture strSelectedAlarmExt2\$ End If End Sub</pre>
User Defined Fields	The value of any A_ field you specify. The maximum length of the name for this field is 50 characters.

## Changing the Column Widths of the Alarm Summary Object

You can change the column widths of a specified Alarm Summary object already inserted into a picture. To do so, while in configure mode or run mode, click and drag the dividers between the column headings. Run mode changes only apply while the picture is run mode, until it is closed, or you switch back to configure mode.

If like these settings and want to change the default column widths of the Alarm Summary object so that you do not have to always reconfigure new Alarm Summary objects to use your preferred settings, you can:

- Drop an Alarm Summary object into your picture in configure mode, adjust the column widths, double-click the Alarm Summary object, and then click the Save button on the Alarm Summary form. This saves your changes to the AlarmSummary.ini file.
- Edit the AlarmSummary.ini directly.

After you make your changes, the column widths get applied to each Alarm Summary object that you subsequently add to a picture. These actions do not change the column widths of Alarm Summary objects that you already inserted into your picture.

**NOTE:** Be aware that when upgrading iFIX some .ini files (including the AlarmSummary.ini file) and all custom \*Res.dll files are overwritten during the upgrade. Be sure to make copies of these files before upgrading. If you do not, you will have to re-do the column adjustments in the Alarm Summary object again, as described in the following steps.

► To change the default column widths by editing the AlarmSummary.ini:

**NOTE:** After changing the defaults, every time you insert a new control, the new default widths are used.

1. Shut down the iFIX WorkSpace if it is running.
2. In Notepad, or another text editor open the AlarmSummary.ini, located in the iFIX Local folder. If you installed iFIX to the default path, the path to this folder is: C:\Program Files (x86)\GE\iFIX\LOCAL.
3. For each col\_width[n] fields you want to change, where *n* is the number of the column you want to update, edit the value next to the equal sign. Setting the column width to a larger number makes the column wider, and setting it to a smaller number makes it smaller.

Refer to the table below for a list of numbers and corresponding column names.

ID	Column Name
col_width[0]	Ack
col_width[1]	Area
col_width[2]	Date In
col_width[3]	Date Last
col_width[4]	Description
col_width[5]	Node
col_width[6]	Priority
col_width[7]	Status
col_width[8]	Tag Name
col_width[9]	Time In
col_width[10]	Time Last
col_width[11]	Value
col_width[12]	Alarm Extension Field 1
col_width[13]	Alarm Extension Field 2
col_width[14]	User Defined Field 1
col_width[15]	User Defined Field 2

4. Save the file.
5. Restart the WorkSpace.
6. Insert the Alarm Summary object into your picture. Notice the change in the column widths. These column widths also apply when you switch to run mode (In Classic view, on the WorkSpace menu, click Switch to Run. In Ribbon view, on the Home tab, in the WorkSpace group, click Switch to Run.).
7. Save the picture.

► To change the column widths of a specific control:

**NOTE:** This will change the column widths of the specified control in both configure and run mode.



1. Insert the Alarm Summary object into your picture.
2. Double-click the control. The Alarm Summary Configuration dialog box appears.
3. Click Cancel. You can now resize the columns with the mouse.
4. Position the pointer over the column heading divider, hold down the left mouse button, drag the column to the desired width, and release the mouse button.
5. Repeat step 4 for any columns that you want resized.
6. Save the picture.

These column widths also apply when you switch to run mode (In Classic view, on the WorkSpace menu, click Switch to Run. In Ribbon view, on the Home tab, in the WorkSpace group, click Switch to Run.).

► **To change the widths in run mode:**

In run mode, position the pointer over the column heading divider, hold down the left mouse button, drag the column to the desired width, and release the mouse button.

**IMPORTANT:** When you switch back to configure mode or close the picture, any changes you make to the column widths in run mode are lost. The column widths are reset to the configure mode settings.

## Configuring for Run-time

You can enable specific operator and run-time properties in the Alarm Summary object. The operator properties enable operators to work interactively with the object by acknowledging, deleting, filtering, and sorting alarms at run-time. The run-time properties control time intervals used by the object. The following two tables summarize the operator and run-time properties you can configure.

**Alarm Summary Operator Properties**

The property...	Lets operators...
Allow Alarm Acknowledgement	Acknowledge alarms with the Alarm Summary object.
Allow Alarm Deletion	Delete alarms from the Alarm Summary object. Unlike the manual deletion option configured in the SCU, the deleted alarms do not need to be acknowledged first.
Allow Run Time Configuration	Change the filter and sort properties of the Alarm Summary object at run-time.
Enable Column Quick Sort	Sort alarms by clicking a column heading.
Display Right Mouse Menu	Right-click the mouse to display a list of commands to acknowledge, filter, sort, delete, and pause alarms.
Alarm refresh rate	The Alarm Summary object examines the Alarm Summary queue for new alarms.
Data refresh rate	The Alarm Summary object updates the alarm values currently displayed.
Blink rate	An alarm flashes when you enable blinking for it.
Selection Timeout	A row in the spreadsheet remains selected. Typically, the spreadsheet automatically scrolls while receiving new alarms. When you select an alarm from the spreadsheet, the scrolling pauses until the selection timeout expires.

**NOTE:** You can also acknowledge, delete, filter, and sort alarms in the Alarm Summary object using an Expert or a script. For more information on completing these tasks using an Expert, refer to the [Creating Pictures manual](#). To learn about the iFIX automation interface, refer to the [Writing Scripts manual](#).

## Saving Settings and Resetting Defaults

Using the Alarm Summary's property sheet, you can save and reset the Alarm Summary object's current settings. Saving the settings allows you define the defaults for all new Alarm Summary objects you subsequently add to your pictures. Likewise, if you reset and then save the object's settings, all new Alarm Summary objects will use the object's preset default values.

When you click the Save button in the Alarm Summary property sheet, your settings are saved into an AlarmSummary.ini file in the LOCAL folder. By default, this path is: C:\Program Files (x86)\GE\iFIX\LOCAL. If an AlarmSummary.ini file does not exist, one is created when you click the Save button. Otherwise, the AlarmSummary.ini is overwritten with the new settings.

For example, say you want you to change the fonts and the column widths of the Alarm Summary object, so that each new Alarm Summary object that you add to a picture uses these fonts and column widths. Drop an Alarm Summary object into your picture, and click and drag the dividers between the column headings so that they appear the way you want them to. Double-click the Alarm Summary object, make your changes to the fonts on the General tab, and then click Save. The next Alarm Summary object that you add to your picture will use these settings.

When you click Reset in the Alarm Summary object, only the settings in the *selected* Alarm Summary object get restored to the preset defaults. If you want other Alarm Summary objects that you create after this one to also use the same default settings, after you click Reset, click Save. This saves your Alarm Summary settings to the AlarmSummary.ini file in the LOCAL folder (by default: C:\Program Files\Proficy\Proficy iFIX\LOCAL), so that subsequent Alarm Summary objects will apply these default settings when you first drop the object into your picture.

## Working with the Alarm Summary Object

As you configure the Alarm Summary object, you can switch to the iFIX WorkSpace's run-time environment to view and test the object's configuration. The object provides a right-click menu. The options on the menu depend on the settings you enable. Among these options are the commands listed in the following table.

Optional Alarm Summary Pop-up Menu Commands		
Enabling the property...	Displays the commands...	And enables the operator to...

Allow Alarm Acknowledgement	Acknowledge	Acknowledge the currently selected alarm.
	Acknowledge All	Acknowledge all the alarms that match the current filter. Upon acknowledging the alarms, the object sends one message to all the enabled alarm destinations for the local node.
	Acknowledge Page	Acknowledge all the alarms on the screen, including animated objects and Data links. Alarms in the spreadsheet that are not displayed are not acknowledged. To view these alarms, use the scroll bars.
Allow Alarm Deletion	Delete	Delete the currently selected alarm. Unlike acknowledging alarms, deleting one alarm sends no message.
	Delete All	Delete all the alarms that match the current filter. Unlike acknowledging alarms, deleting all alarms sends no message.
Allow Run Time Configuration	Filter	Change the Alarm Summary object's filter configuration.
	Sort	Change the Alarm Summary object's sort configuration.
Is Selectable	Tag Status	Open the Tag Status picture of the tag associated with the selected object.
		If multiple tags are associated with the selected object, open the Tag Status picture of the first associated tag, or open the Tag Control Panel picture, which lists the Tag Status pictures of all tags associated with the selected object.
	Quick Trend	Open the Quick Trend picture of the tag(s) associated with the selected object(s). The Quick Trend picture displays up to eight pens when multiple tags are associated with the selected object(s).

The other commands in the menu always appear. The following table lists these commands:

#### Standard Alarm Summary Pop-up Menu Commands

The option...	Enables operators to...
Properties	Configure the Alarm Summary object by displaying its property sheet.
Show/Hide Grid Lines	Show and hide the grid lines in the object.
Enable/Disable Alarm Horn	Enable or disable the Alarm Horn.
Silence Alarm Horn	Silence the Alarm Horn for the current alarms.
Pause Alarm Read	Temporarily disable the alarm refresh rate and instruct the Alarm Summary object to stop updating the spreadsheet.

**NOTE:** You can have up to 30 Alarm Summary objects active in the iFIX WorkSpace run-time environment.

#### Keyboard Shortcuts

If you are using a keyboard, the following keys control the Alarm Summary object:

#### Alarm Summary Object Keyboard Shortcuts

Use the key...	To...
F3	Scroll right.
F4	Scroll left.

F5	Scroll the window up one line.
F6	Scroll the window down one line.
F7	Scroll the window up one page.
F8	Scroll the window down one page.
F9	Deselect an alarm.
Spacebar	Select an alarm.
A	Acknowledge all the alarms that match the current filter. Upon acknowledging the alarms, the object sends one message to all the enabled alarm destinations for the local node.
K	Acknowledge all the alarms on the screen, including animated objects and Data links. Alarms in the spreadsheet that are not displayed are not acknowledged. To view these alarms, use the scroll bars.
C	Change the order of columns or the specific columns displayed by the Alarm Summary object.
F	Change the Alarm Summary object's filter configuration.
S	Change the Alarm Summary object's sort configuration.
P	Temporarily disable the alarm refresh rate and instruct the Alarm Summary object to stop updating the spreadsheet.
Delete	Delete the currently selected alarm. Unlike acknowledging alarms, deleting one alarm sends no message.
D	Delete all the alarms that match the current filter. Unlike acknowledging alarms, deleting all alarms sends no message.

## Using the SUMQDEL.EXE Program

The SUMQDEL.EXE program automatically purges acknowledged and returned to normal alarms from the summary list queue. Since the Alarm Summary only reads real-time values for the alarms that are showing, alarms are not deleted from the summary queue until they are scrolled into view and the Alarm Summary reads the real-time values to see that it is acknowledged and returned to normal. Therefore, alarms that are not visible are never deleted from the summary queue.

SUMQDEL.EXE reads the real-time values of all alarms in the summary queue, not just those that are visible. Therefore, any alarms that have been acknowledged and returned to normal are deleted. One specific use is to run SUMQDEL.EXE on a SCADA node that does not run WorkSpace so that the alarm startup queue can be kept to a minimum.

The SUMQDEL.EXE program is enabled by default on SCADA nodes. The default frequency is 30 minutes. If you want to disable SUMQDEL.EXE on a SCADA node, remove the program from the list of startup tasks in SCU.

To use the SUMQDEL.EXE program on an iClient, you must add the program to the list of startup tasks in SCU. The following is a list of command line parameters that you can use:

Parameter	Description	Example	Effect
-Fd:h:m:s	The Frequency parameter specifies how often the task will look for alarms to delete. If omitted, the task will make one pass at the alarm queue, then shutdown.	- F01:00:00:00  -F12:00:00	Alarms are checked once a day.  Alarms are checked

		-F30:00	every 12 hours.
			Alarms are checked every 30 minutes.
-Dd:h:m:s	The Delay parameter specifies how long the task is delayed after startup before it starts its first pass at the alarm queue. If omitted, the first pass will not be delayed.	-D01:00:00	First pass delayed one hour.
		-D10	First pass delayed 10 seconds.

**NOTE:** To ensure that the alarm count matches on all nodes, you must run SUMQDEL.EXE on every node that shows an Alarm Summary, and on all networked SCADAs, even if they do not show an alarm summary.

## Using Alarms at Run-time

This chapter explains how to acknowledge alarms with any picture running on your iFIX nodes. The chapter also describes alarm operations you can perform, such as enabling and disabling alarms in blocks. For more information, refer to the following topics:

- [Enabling and Disabling Alarms](#)
- [Understanding Alarm Acknowledgment](#)

### Enabling and Disabling Alarms

Operators can enable and disable alarms for a block using a Data link that references the field A\_ENAB. Enter **Y** to enable alarming or **N** to disable it. The block accepts changes to this field if the following conditions are true:

- The specified block is on scan.
- The operator has access to the block's security area.
- The block accepts operator input.

You can also provide objects with a VBA script that enable and disable alarms. You can quickly add such a script to an object with the Enable Alarm and the Disable Alarm Experts. To use these Experts, you must first add them to a toolbar. To learn how to add Experts (buttons) to a toolbar, refer to the [Customizing Toolbars](#) section of the Understanding iFIX manual.

### Understanding Alarm Acknowledgment

At run-time, alarms produce visual cues in your pictures. These cues appear as colored or flashing text in the Alarm Summary object and in Data links, or as animated objects triggered by alarms. You can configure alarm-based visual cues to remain on the screen until your operators acknowledge the alarms that cause them and the block's value returns to normal.

iFIX maintains latched and current alarms. The current alarm is a block's current alarm state, and the latched alarm is a block's most severe unacknowledged alarm. If a block generates a High High alarm, the latched and current alarm are the same: High High. If the block then generates a High alarm, the current alarm changes to High, but the latched alarm remains High High.

Data links, animated objects, and Alarm Summary objects each handle alarm acknowledgements differently. For example, a Data link shows the current alarm until either a new alarm occurs, or the block's value returns to normal. Similarly, a Data link displays the latched alarm until an operator acknowledges the alarm. Then, the link shows the next most severe unacknowledged alarm. For a list of alarms and their severity, refer to the [Block Alarm Severity](#) table.

Alarms in the Alarm Summary object, on the other hand, respond identically to the latched alarm. The most severe unacknowledged alarm appears in the object's spreadsheet. When an operator acknowledges the alarm, the next most severe alarm appears, text stops flashing, and colored text returns to its original color. Then, the Alarm Summary Service waits for the block's value to return to normal. Once this happens, the service automatically deletes the alarm.

Alarms used to animate objects handle alarm acknowledgments similar to Data links. For example, suppose you animate the visibility of an object using the current alarm. When the alarm state is OK, the object is invisible. However, when an alarm occurs, you display the object to show that there is a value in alarm. In this setup, the object may remain visible even after an operator acknowledges the alarm, because the current alarm is always the current alarm state of the data source. Consequently, only when the object's data source returns to normal does the object disappear.

**NOTE:** If you want the object to disappear when an operator acknowledges an alarm, use the field `A_NALM` in the data source. For more sophisticated alarm-handling, you could create a complex data source with an expression such as:

```
(FIX32.FERMENT1.OVEN1.A_CUALM<>"OK") AND _
(FIX32.FERMENT1.OVEN1.A_NALM="YES")
```

Animating an object with a latched alarm works in a similar way to the current alarm. For example, assume you color an object based on the latched alarm. When a latched alarm occurs, the object's color changes to match it. As operators acknowledge alarms, the latched alarm changes and the object's color changes with it. As a result, the object is always the color of the most severe unacknowledged alarm.

## Multiple Alarm Acknowledgment

Depending on how you configure your process database, operators may receive alarms for blocks already in alarm. When a block that is in alarm generates another one, the alarm's severity controls how the Alarm Summary object updates.

Handling Multiple Alarms with the Alarm Summary Object		
When subsequent alarms are...	The Alarm Status is...	And the alarm value is...

More severe	Updated	Updated.
Equally or less severe	Not updated, if the previous alarms for the block are unacknowledged	Updated.

The alarm's severity also controls how Data links and animated objects update when they reference the latched alarm. If the current alarm is referenced, Data links and animated objects update according to the new alarm state.

Handling Latched Alarms with Data Links and Animated Objects		
When sub-sequent alarms are...	Then...	
More severe	The Data link replaces the old latched alarm with the new one. Animated objects update based on the new latched alarm.	
Equally or less severe	The Data link retains the old latched alarm until an operator acknowledges it. Animated objects update based on the old latched alarm until an operator acknowledges it.	

For a list of alarms and their severity, refer to the following table.

Block Alarm Severity		
Severity	Alarm Status	Description
1 (highest)	Communications Error	Communication Error ("BAD" value).
2	Change of State	Change of State (Digital blocks only).
3	Change from Normal	Change From Normal (Digital block only).
4	ERROR	Error generated by Statistical Data block.
5	High High, Low Low	The block is in the HIHI alarm state (High High), or the block is in the LOLO alarm state (Low Low).
6	Rate of Change	Value exceeds rate of change setting since last scan period.
7	High, Low	The block is in the HI alarm state (High), or the block is in the LO alarm state (Low).
8	Deviation	Deviation from the set point.
9 (lowest)	OK	The block is in normal state.

### Equal Severity

As you can see from the previous table, iFIX treats High and Low alarms, and High High and Low Low alarms with equal severity. As a result, if a Data link showing the latched alarm receives a High alarm and a Low alarm from the same block, the first alarm that iFIX delivers is displayed until an operator acknowledges it. Then the second alarm appears in the link. The Alarm Summary object and objects animated by the latched alarm respond in a similar fashion. The first alarm of equal severity appears or animates the object until an operator acknowledges the alarm.

## Acknowledging Alarms

Operators can only acknowledge alarms if you provide a way to do so. For example, you may want operators to click a push button or a flashing object on the screen. Once you decide how your operators should acknowledge alarms, you can add this feature to your pictures by adding the objects you need and writing a script. You can add such a script to an object by clicking the Acknowledge Alarm Expert on the Experts toolbar. For more information about using this toolbar, refer to the [Creating Pictures](#) manual.

If you would prefer not to use an object, you can add an Alarm Summary object to your pictures. This object lets an operator acknowledge alarms by double-clicking an alarm. You can also right-click the object's spreadsheet and select one of the following commands from the pop-up menu:

- Acknowledge (to respond to a single alarm)
- Acknowledge Page (to respond to all the alarm on the screen including Data links and animated objects)
- Acknowledge All (to respond to all the alarms that match the object's alarm filter)

If you acknowledge all alarms in the Alarm Summary OCX, either from the right-click menu or from the AcknowledgeAllAlarms Expert, only one message (All Alarms Acknowledged) is sent per node. This is different from acknowledging all alarms on a 6.x node where a message is sent to the alarm services for each database block acknowledged.



## Using Alarm Counters

Alarm counters provide a way for you to determine the general alarm state of a single SCADA server, or areas within that server. They indicate how many tags on a node are in alarm, how many of these alarms are CRITICAL, HIHI, HIGH, MEDIUM, LOW, LOLO, and INFO priority, and how many are acknowledged or unacknowledged.

Alarm counters do not span nodes. However, if you want to get a view of your entire system, you can use VBA scripts or mathematical expressions to combine alarm counter information from two or more nodes. You can access alarm counters locally or remotely.

You can also use alarm counters to animate and color process graphics to alert you to an alarm. For example, you can configure an object to display a certain foreground color when there are unacknowledged alarms in a specific alarm area.

Alarm counters allow you to:

- Display an accurate count of acknowledged (but outstanding) and unacknowledged alarms in the WorkSpace.
- Use digital or analog blocks as triggers for alarm handling conditions within a process database.
- Attribute animations to objects based upon alarm conditions.
- Display values that determine whether or not acknowledged and unacknowledged alarms exist in your system.

## Features

The following list summarizes the alarm counters features:

- All alarm counters in FIX32 are available in iFIX, allowing FIX32 nodes to retrieve alarm counter information from iFIX nodes over the network.
- All alarm counters contain numeric fields which allow you to display counter information in numeric format and perform mathematical operations such as displaying alarm counter information for Area C + Area D.
- All alarm counters available for standard (A-P) areas are available for custom (non A-P) alarm areas. This information is available through a Tag. Field interface.
- An ALARMCOUNTERS tag to access node alarm counters.
- Alarm counters to indicate blocks with alarming disabled.
- Alarm counters to provide a running total of alarms for a node or an area since system startup.
- An Alarm Counters tab in the Expression Builder to browse alarm areas.

## Using Alarm Counters for Standard (A-P) and Custom (non A-P) Alarm Areas

All alarm counters used for standard alarm areas (A-P) can also be used for custom (non A-P) areas.

The following table describes each area alarm counter. It lists the SYSTEM tag fields, and the SIM addresses used to access alarm counter information for standard and custom alarm areas.

**NOTE:** In the SYSTEM tag fields and the SIM addresses in the following table, substitute your alarm area (A-P) for %. The SYSTEM tag access applies only to standard areas (A-P).

Area Alarm Counters			
To display the number of...	You can use the SYSTEM tag...	Or the SIM Address...	Or the Area Alarm Counters...
Acknowledged alarms in area "area."	System.A_AA %	C:area:ACK or C:AA %	area.A_AREA_ ACK or area.F_AREA_ ACK
Unacknowledged alarms in area "area."	System.A_UA %	C:area:UNACK or C:UA %	area.A_AREA_ UNACK or area.F_AREA_ UNACK area.A_CV or area.F_CV
Alarms in area "area."	N/A	C:area:TOT	area.A_AREA_ TOT or area.F_AREA_ TOT
CRITICAL priority alarms in area "area."	N/A	C:area:TOTC	area.A_AREA_ TOTCRIT or area.F_AREA_ TOTCRIT
HIHI priority alarms in area "area."	N/A	C:area:TOTHH	area.A_AREA_ TOTHIHI or area.F_AREA_ TOTHIHI
HIGH priority alarms in area "area."	N/A	C:area:TOTHI	area.A_AREA_ TOTHI or area.F_AREA_ TOTHI
MEDIUM priority alarms in area "area."	N/A	C:area:TOTMED	area.A_AREA_ TOTMED or area.F_AREA_ TOTMED
LOW priority alarms in area "area."	N/A	C:area:TOTLO	area.A_AREA_ TOTLO or

			<i>area.F_AREA_TOTLO</i>
LOLO priority alarms in area " <i>area</i> ."	N/A	C: <i>area</i> :TOTLL	<i>area.A_AREA_TOTLOLO</i> or <i>area.F_AREA_TOTLOLO</i>
INFO priority alarms in area " <i>area</i> ."	N/A	C: <i>area</i> :TOTI	<i>area.A_AREA_TOTINFO</i> or <i>area.F_AREA_TOTINFO</i>
CRITICAL priority acknowledged alarms in area " <i>area</i> ."	N/A	C: <i>area</i> :ACKC	<i>area.A_AREA_ACKCRIT</i> or <i>area.F_AREA_ACKCRIT</i>
HIHI priority acknowledged alarms in area " <i>area</i> ."	N/A	C: <i>area</i> :ACKHH	<i>area.A_AREA_ACKHIHI</i> or <i>area.F_AREA_ACKHIHI</i>
HIGH priority acknowledged alarms in area " <i>area</i> ."	N/A	C: <i>area</i> :ACKHI	<i>area.A_AREA_ACKHI</i> or <i>area.F_AREA_ACKHI</i>
MEDIUM priority acknowledged alarms in area " <i>area</i> ."	N/A	C: <i>area</i> :ACKMED	<i>area.A_AREA_ACKMED</i> or <i>area.F_AREA_ACKMED</i>
LOW priority acknowledged alarms in area " <i>area</i> ."	N/A	C: <i>area</i> :ACKLO	<i>area.A_AREA_ACKLO</i> or <i>area.F_AREA_ACKLO</i>
LOLO priority acknowledged alarms in area " <i>area</i> ."	N/A	C: <i>area</i> :ACKLL	<i>area.A_AREA_ACKLOLO</i> or <i>area.F_AREA_ACKLOLO</i>
INFO priority acknowledged alarms in area " <i>area</i> ."	N/A	C: <i>area</i> :ACKI	<i>area.A_AREA_ACKINFO</i> or <i>area.F_AREA_ACKINFO</i>
CRITICAL priority unacknowledged alarms in area " <i>area</i> ."	N/A	C: <i>area</i> :UNACKC	<i>area.A_AREA_UNACKCRIT</i> or <i>area.F_AREA_</i>

			UNACKCRIT
HIHI priority unacknowledged alarms in area "area."	N/A	C:area:UNACKHH	area.A_AREA_UNACKHIHI or area.F_AREA_UNACKHIHI
HIGH priority unacknowledged alarms in area "area."	N/A	C:area:UNACKHI	area.A_AREA_UNACKHI or area.F_AREA_UNACKHI
MEDIUM priority unacknowledged alarms in area "area."	N/A	C:area:UNACKMED	area.A_AREA_UNACKMED or area.F_AREA_UNACKMED
LOW priority unacknowledged alarms in area "area."	N/A	C:area:UNACKLO	area.A_AREA_UNACKLO or area.F_AREA_UNACKLO
LOLO priority unacknowledged alarms in area "area."	N/A	C:area:UNACKLL	area.A_AREA_UNACKLOLO or area.F_AREA_UNACKLOLO
INFO priority unacknowledged alarms in area "area."	N/A	C:area:UNACKI	area.A_AREA_UNACKINFO or area.F_AREA_UNACKINFO

The following examples show the syntax used to access standard and custom alarm areas.

#### Example: Using Alarm Counters for Alarm Areas A-P

This example shows how to use the information in the [Area Alarm Counters](#) table to display the number of unacknowledged alarms in area "B."

If you are using the...	Use this syntax in a Data link...
SIM Driver	C:UAB
Area Alarm Counter	NODE.B.A_AREA_UNACK
SYSTEM tag	NODE.SYSTEM.A_UAB

#### Example: Using Alarm Counters for Custom (non A-P) Alarm Areas

This example shows how to use the information in the [Area Alarm Counters](#) table to display the number of unacknowledged alarms in a custom alarm area, for example, area "Line1."

If you are using the...	Use this syntax in a Data link...
SIM Driver	C:Line1:UNACK
Area Alarm Counter	NODE.Line1.A_AREA_UNACK

**NOTE:** There is no SYSTEM tag access to custom areas.

## Using the ALARMCOUNTERS Tag Fields to Access Node Alarm Counters

The following table contains a complete list of node alarm counters. The reserved tag name, ALARMCOUNTERS, contains fields for the counter totals as shown in the following table.

Node Alarm Counters			
To display a count of...	You can use the SIM Address...	Or the ALARMCOUNTERS Tag...	Or the SYSTEM Tag...
Acknowledged INFO priority alarms on the local system	C:ACKI	A_ACKINFO or F_ACKINFO	A_ACKI or F_ACKI
Acknowledged LOLO priority alarms on the local system	C:ACKLL	A_ACKLOLO or F_ACKLOLO	A_ACKLL or F_ACKLL
Acknowledged LOW priority alarms on the local system	C:ACKL	A_ACKLO or F_ACKLO	A_ACKL or F_ACKL
Acknowledged MEDIUM priority alarms on the local system.	C:ACKM	A_ACKMED or F_ACKMED	A_ACKM or F_ACKM
Acknowledged HIGH priority alarms on the local system.	C:ACKH	A_ACKHI or F_ACKHI	A_ACKH or F_ACKH
Acknowledged HIHI priority alarms on the local system.	C:ACKHH	A_ACKHIHI or F_ACKHIHI	A_ACKHH or F_ACKHH
Acknowledged CRITICAL priority alarms on the local system.	C:ACKC	A_ACKCRIT or F_ACKCRIT	A_ACKC or F_ACKC
Unacknowledged INFO priority alarms on the local system.	C:ACKI	A_UNACKINFO or F_UNACKINFO	A_ACKI or F_ACKI
Unacknowledged LOLO priority alarms on the local system.	C:UACKLL	A_UNACKLOLO or F_UNACKLOLO	A_UACKLL or F_UACKLL

Unacknowledged LOW priority alarms on the local system.	C:UACKL	A_UNACKLO or F_UNACKLO	A_UACKL or F_UACKL
Unacknowledged MEDIUM priority alarms on the local system.	C:UACKM	A_UNACKMED or F_UNACKMED	A_UACKM or F_UACKM
Unacknowledged HIGH priority alarms on the local system.	C:UACKH	A_UNACKHI or F_UNACKHI	A_UACKH or F_UACKH
Unacknowledged HHHI priority alarms on the local system.	C:UACKHH	A_UNACKHHI or F_UNACKHHI	A_UACKHH or F_UACKHH
Unacknowledged CRITICAL priority alarms on the local system.	C:UACKC	A_UNACKCRIT or F_UNACKCRIT	A_UACKC or F_UACKC
The total acknowledged alarms on the local system.	C:ATOT	A_ACKTOT or F_ACKTOT	A_ATOT or F_ATOT
The total unacknowledged alarms on local system.	C:UTOT	A_UNACKTOT or F_UNACKTOT  A_CV or F_CV	A_UTOT or F_UTOT
The total alarms on the local system.	N/A	A_TOT or F_TOT	N/A
The summary of alarms in the “Area” specified. The available values for the status flags are: <ul style="list-style-type: none"> <li>• 0 - No Alarms</li> <li>• 1 - Only ACK Alarms Exist</li> <li>• 2 - Only UNACK Alarms Exist</li> <li>• 3 - Both ACK and UNACK Alarms exist</li> </ul>	C: Area:STATUS	Area.F_AREA_ STATUS	N/A

The total shelved alarms.	N/A	A_SHELVETOT or F_SHELVETOT	N/A
---------------------------	-----	-------------------------------	-----

**NOTE:** To detect changes in a set of alarm areas, monitor the `NODE.ALARMCOUNTERS.F_SERIALNO` tag for changes.

### Example: Using Node-based Alarm Counters

This example shows how to use the information in the [Node Alarm Counters](#) table to display the number of unacknowledged alarms on the local node.

If you are using the...	Use this syntax...
SIM Driver	C:UTOT
ALARMCOUNTERS tag	NODE.ALARMCOUNTERS.F_UNACKTOT
SYSTEM tag	NODE.SYSTEM.F_UTOT

## Using Alarm Counters for Disabled Alarms

iFIX has alarm counters for tags with alarming disabled. These counters allow you to display the number of tags with alarming disabled by area or node. When all of the following conditions are met, a tag is considered to have alarming disabled:

- Block is configured for alarming (Tag.A\_IENAB=ENABLED).
- Alarming was disabled after database load (Tag.A\_ENAB=DISABLED).
- Tag is currently on scan (Tag.A\_SCAN=ON).

Because iFIX never generates alarms for tags with alarming disabled, it is important to know how many tags have alarming disabled so that you do not forget them. You can then re-enable alarming when appropriate.

**IMPORTANT:** Analog Alarm (AA) blocks modify the counters of low priority disabled alarms, regardless of the priorities that are configured in the block.

For example, if you have configured your AA block to send Medium priority alarms when the Hi and HiHi alarm limits are exceeded, and you disable alarming for the block, the `area.A_AREA_DSABLO` and `ALARMCOUNTERS.A_DSABLO` counters will increment, not the `area.A_AREA_DSABMED` and `ALARMCOUNTERS.A_DSABMED` counters.

You can always use the disabled total counters `A_AREA_DSABTOT` and `A_DSABTOT` to determine if you have any disabled alarms.

The [Area Alarm Counters for Disabled Alarms](#) and [Node Alarm Counters for Disabled Alarms](#) tables in the following sections describe the area and node alarm counters for disabled alarms. These sections also provide examples of how to use these counters to display alarm information.

## Area Alarm Counters for Disabled Alarms

iFIX allows you to display a count of disabled alarms by area on a particular SCADA server. The following table describes the ASCII and numeric disabled area alarm counters.

### Area Alarm Counters for Disabled Alarms

To display a count of all disabled...	Use these alarm counters...
Alarms in area "area."	area.A_AREA_DSABTOT or area.F_AREA_DSABTOT
CRITICAL priority alarms in area "area."	area.A_AREA_DSABCRIT or area.F_AREA_DSABCRIT
HIHI priority alarms in area "area."	area.A_AREA_DSABHIHI or area.F_AREA_DSABHIHI
HIGH priority alarms in area "area."	area.A_AREA_DSABHI or area.F_AREA_DSABHI
MEDIUM priority alarms in area "area."	area.A_AREA_DSABMED or area.F_AREA_DSABMED
LOW priority alarms in area "area."	area.A_AREA_DSABLO or area.F_AREA_DSABLO
LOLO priority alarms in area "area."	area.A_AREA_DSABLOLO or area.F_AREA_DSABLOLO
INFO priority alarms in area "area."	area.A_AREA_DSABINFO or area.F_AREA_DSABINFO

### Example

To display a count of all disabled alarms for area "Line1," enter the following syntax in a Data link:

```
FIX32.NODE.Line1.F_AREA_DSABTOT
```

## Node Alarm Counters for Disabled Alarms

iFIX allows you to display a total count of all disabled alarms on a particular SCADA server. This includes standard (A-P) and custom (non A-P) areas.

The following table describes the ASCII and numeric node alarm counters for disabled alarms.

### Node Alarm Counters for Disabled Alarms

To display a count of ...	Use these alarm counters...
INFO priority disabled alarms.	ALARMCOUNTERS.A_DSABINFO or ALARMCOUNTERS.F_DSABINFO
HIHI priority disabled alarms.	ALARMCOUNTERS.A_DSABHIHI or ALARMCOUNTERS.F_DSABHIHI
HIGH priority disabled alarms.	ALARMCOUNTERS.A_DSABHI or ALARMCOUNTERS.F_DSABHI
MEDIUM priority disabled alarms.	ALARMCOUNTERS.A_DSABMED or ALARMCOUNTERS.F_DSABMED
LOW priority disabled alarms.	ALARMCOUNTERS.A_DSABLO or ALARMCOUNTERS.F_DSABLO



LOLO priority disabled alarms.	ALARMCOUNTERS.F_DSABLO ALARMCOUNTERS.A_DSABLOLO or
INFO priority disabled alarms.	ALARMCOUNTERS.F_DSABLOLO ALARMCOUNTERS.A_DSABINFO or
Total disabled alarms.	ALARMCOUNTERS.F_DSABINFO ALARMCOUNTERS.A_DSABTOT or ALARMCOUNTERS.F_DSABTOT

### Example

To display a count of the total disabled alarms on a SCADA server, enter the following syntax in a Data link:

```
FIX32.NODE.ALARMCOUNTERS.F_AREA_DSABTOT
```

## Using the Running Total Alarm Counters

iFIX provides a way for you to detect each time a new alarm is generated. This information is helpful during a counter transition where one alarm is deleted and another is generated at the same time. When this happens, the alarm count stays the same, making it difficult to detect that a new alarm was generated.

Usually, alarm counters increment when an alarm is generated and decrement when the alarm is acknowledged and returned to normal. The running total counter, however, starts at zero when iFIX starts or when you load a database, and increments each time an alarm is generated for that area or node, or when a new alarm occurs that increments the unacknowledged counters.

The following table lists the area and node running total alarm counters.

Area and Node Running Total Alarm Counters	
To display...	Use these alarm counters...
a running total of alarms in area " <i>area</i> ."	" <i>area</i> ".A_AREA_RUNNINGTOT or " <i>area</i> ".F_AREA_RUNNINGTOT
a running total of alarms for node " <i>node</i> ."	ALARMCOUNTERS.A_RUNNINGTOT or ALARMCOUNTERS.F_RUNNINGTOT

### Example

This example shows how to use the alarm counters in the [Area and Node Running Total Alarm Counters](#) table to display a running total of alarms for a node or area.

To display a running total of alarms for...	Use this syntax ...
area " <i>Line1</i> "	<i>Line1</i> .A_AREA_RUNNINGTOT
node " <i>B</i> "	<i>B</i> .ALARMCOUNTERS.A_RUNNINGTOT

## Accessing Alarm Counter Information

You can use alarm counters in a display to quickly identify the presence of acknowledged and unacknowledged alarms in your system. iFIX provides two ways to access alarm counter information:

- Use a database block to access a counter through the SIM driver.
- Use a tag field (SYSTEM tag, ALARMCOUNTERS tag or area name) within the WorkSpace.

The method you choose depends on your needs. If you want your database to react based on one or more of the alarm counters, assign one or more blocks to the SIM driver. The database logic processes alarms even when the WorkSpace is not running.

If you want to display a count of alarms in the WorkSpace or use animations, access the counter directly from a tag field.

You can use any combination of the two methods listed above. Each method returns the same information, and there are no restrictions on combining methods. Each method is described in further detail in the following sections.

## Accessing Alarm Counters from a Tag Field

The following table shows three ways to display alarm counter information from a tag field.

If you want to ...	Use this syntax...
Display the current unacknowledged alarms in alarm area " <i>Line 1</i> "	NODE. <i>Line 1</i> .F_AREA_UNACK (in a Data Link)
Color an object when there are acknowledged HIGH priority alarms in your system	NODE.ALARMCOUNTERS.F_ACKHI (in the Animations Dialog box)
Make an object blink when there are current unacknowledged alarms in your system	NODE.ALARMCOUNTERS.F_UNACKTOT (in the Animations Dialog box)

**NOTE:** If the alarm area you specify has spaces in its name, you must either type the fully-qualified name or select the alarm counter source through the expression builder.

## Accessing Alarm Counters from Database Blocks

iFIX allows you to access alarm counters from a block in the database, and then pass this value to the next block in the chain.

For example, assume that you are a process engineer responsible for monitoring a plant process. You need to develop a SCADA system that illuminates a light on your plant floor whenever an unacknowledged HIGH priority alarm occurs in your system. In this example, you would create a database chain with the Database Manager application that contains an Analog Input block chained to a Digital Output block.

The Analog Input block is used to fetch the unacknowledged HIGH priority alarm counter from the SIM driver. The Digital Output block is used to write the counter's value to a switch in the PLC that is responsible for turning a light on or off.

► To setup the example in this topic:

1. Add an Analog Input block to your process database with Database Manager.
2. Configure the Analog Input block to access the unacknowledged HIGH priority alarm counter. To do this, enter SIM in the Device field of the Analog Input Block dialog box to access the SIM driver.
3. Add the following into the I/O Address field:

C:UACKH

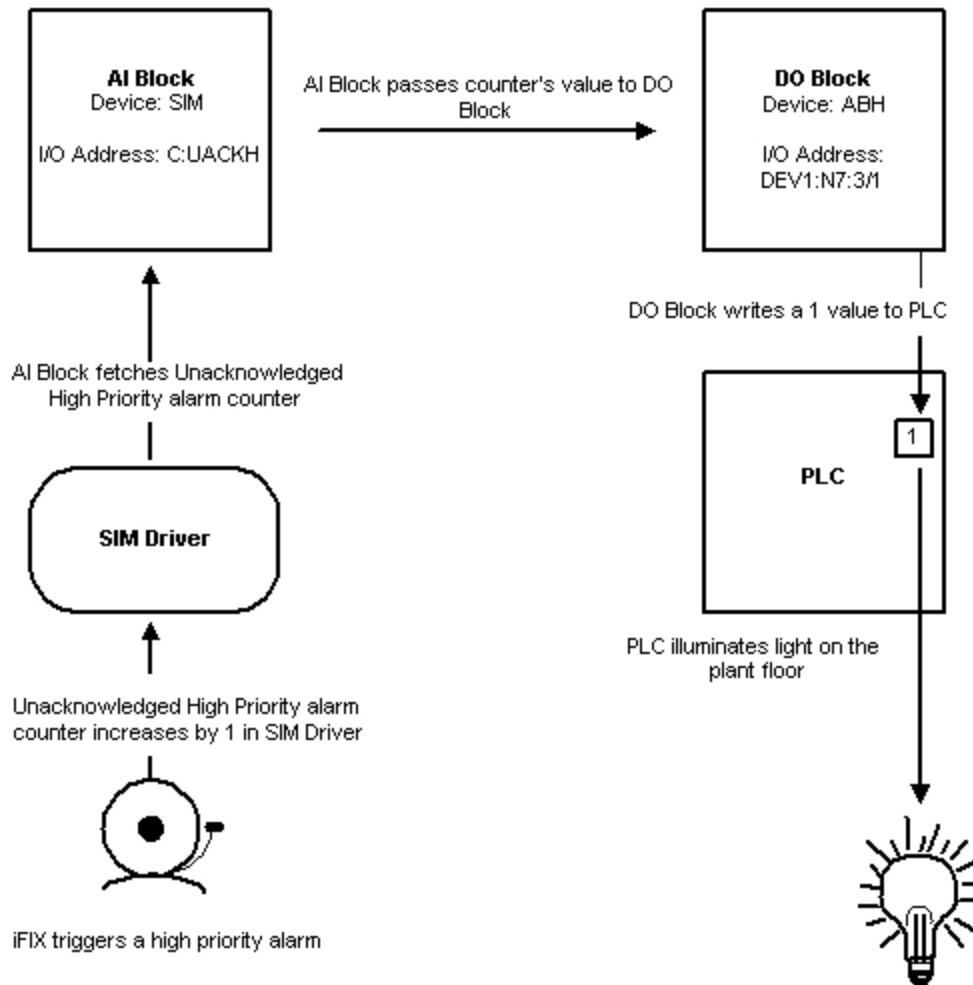
The following table explains the syntax used in Step 4.

Syntax	Description
C	Tells iFIX to fetch a counter.
UACKH	The location in the SIM driver that stores unacknowledged HIGH priority alarm information.

4. In the Next Block field, type the block name of the Digital Output block, and click the Right Arrow button.

If the block does not exist, you can create it now by entering your I/O Driver device name in the Device field, then entering the I/O address that controls the light switch in the I/O Address field.

The following figure illustrates these steps.



### *Using Alarm Counters from Database Blocks*

In this example, iFIX generates a HIGH priority alarm. The unacknowledged HIGH priority alarm counter in the SIM driver increments by 1. The Analog Input block accesses this value (1), and passes the value to the Digital Output block.

The Digital Output block then writes the value to the PLC I/O Address, which changes the status of the light from off to on. As the counter increases, the DO block continues to receive non-zero values, which it interprets as 1 values. The light stays on until the alarm counter in the SIM driver returns to 0.

## Displaying Alarm Counter Status

iFIX provides a way for you to quickly display whether there are any acknowledged or unacknowledged alarms in a node or area. The alarm counter status is an analog or digital value that indicates whether acknowledged or unacknowledged alarms exist.

The following table shows the possible analog and digital values and the associated alarm condition.

## Alarm Counter Status Values

### An- Digital Alarm Condition

#### alo- Value

#### g

#### Val-

#### ue

0	00	No alarms.
1	01	Only ACK alarms exist.
2	10	Only UNACK alarms exist.
3	11	Both ACK and UNACK exist.

Use the area or node alarm status counters described in the following section to access status information for a particular area or node.

## Area and Node Alarm Status Counters

The following tables describe the area and node alarm status counters.

**NOTE:** In the SYSTEM tag field and the SIM address in the following table, substitute your alarm area A-P for %.

### Area Alarm Status Counters

To indicate the presence of...	You can use the SIM Address...	Or the SYSTEM Tag...	Or the area status counters...
Alarms in area "area."	C:area:STATUS or C:SA %	System.F_SA %	area.F_STATUSTOT
INFO priority alarms in area "area."	C:area:STATUSI	N/A	area.F_STATUSINFO
LOLO priority alarms in area "area."	C:area:STATUSLL	N/A	area.F_STATUSLOLO
LOW priority alarms in area "area."	C:area:STATUSLO	N/A	area.F_STATUSLO
MEDIUM priority alarms in area "area."	C:area:STATUSMED	N/A	area.F_STATUSMED
HIGH priority alarms in area "area."	C:area:STATUSHI	N/A	area.F_STATUSHI
HIHI priority alarms in area "area."	C:area:STATUSHH	N/A	area.F_STATUSHIHI
CRITICAL priority alarms in area "area."	C:area:STATUSC	N/A	area.F_STATUSCRIT

### Example

This example shows the syntax used to select specific status bits in a database block such as DI.

► To detect unacknowledged alarms in area Line1:

1. Create a Digital Input block with the I/O address C:Line1:STATUS:1
2. Create a Data link. Make sure the field portion of the tag name references F\_CV of the Digital block you created. The value in the link displays 0 when there are no unacknowledged alarms and displays 1 when there are unacknowledged alarms.

To detect acknowledged alarms, use the previous procedure and enter the I/O address C:Line1:STATUS:0 in Step 1.

Node Alarm Status Counters			
To indicate the presence of...	You can use the SYSTEM Tag...	Or the SIM Address...	Or the ALARMCOUNTERS Tag...
CRITICAL priority alarms on the local machine.	F_SCRIT	C:SCRIT	ALARMCOUNTERS.F_STATUSCRIT
HIHI priority alarms on the local machine.	F_SHIHI	C:SHIHI	ALARMCOUNTERS.F_STATUSHIHI
HIGH priority alarms on the local machine.	F_SHI	C:SHI	ALARMCOUNTERS.F_STATUSHI
MEDIUM priority alarms on the local machine.	F_SMED	C:SMED	ALARMCOUNTERS.F_STATUSMED
LOW priority alarms on the local machine.	F_SLO	C:SLO	ALARMCOUNTERS.F_STATUSLO
LOLO priority alarms on the local machine.	F_SLOLO	C:SLOLO	ALARMCOUNTERS.F_STATUSLOLO
INFO priority alarms on the local machine.	F_SINFO	C:SINFO	ALARMCOUNTERS.F_STATUSINFO
Any alarms on the local machine.	F_STOT	C:STOT	ALARMCOUNTERS.F_STATUSTOT

### Example

This example shows the syntax used to select specific status bits in a database block such as DI.

► To detect unacknowledged alarms for a particular node:

1. Create a Digital Input block with the I/O address C:STOT:1.
2. Create a Data link. Make sure the field portion of the tag name references F\_CV of the Digital block you created. The value in the link displays 0 when there are no acknowledged alarms and displays 1 when there are acknowledged alarms.

To check for the presence of acknowledged alarms, use the previous procedure and enter the I/O address C:STOT:0 in Step 1.

Refer to the [Building a SCADA System](#) for more information on selecting bits with the SIM driver.

## Browsing Alarm Counters

Use the Alarm Counters tab on the Expression Builder dialog box to browse alarm counters while building expressions. When you select a node name, iFIX displays all the pre-defined alarm areas for that

node. It also displays all the ALARMCOUNTERS tag fields. Select an area to display the fields described in this chapter.

## Adding, Renaming, or Deleting Alarm Areas

You do not need to restart iFIX after you add, rename, or delete an alarm area. Alarm counters are available immediately for the added or renamed areas. Counters are unavailable for areas that have been deleted.

Alarm areas are created when you import a database file. However, you may need to import the database twice. The first time you import the database, it creates all the areas. You must then, reload the empty database and import it again to create the database blocks.

**NOTE:** If you are importing a database GDB or CSV file that contains SIM addresses to custom areas, the areas must exist or you will receive an invalid SIM address error. If this happens, reload the empty database and import the file again.

**NOTE:** If you have an outstanding alarm and you delete the alarm area associated with the block and then re-add the alarm area, it is possible for the alarm counter for that area to decrement past zero.

## Detecting Identical Tag Names and Alarm Area Names

iFIX has a collision detection program that detects when a tag name and an alarm area name are identical. When this happens, the alarm counter is unavailable because the system always attempts to read data from the process database tag and not the alarm counter tag.

The collision detection program uses an executable file (AREAASTG.EXE) to check automatically for duplicate names on system startup. The executable file is listed in the FIX.INI file. You can manually run AREAASTG.EXE whenever iFIX is running.

To run this file manually, locate it in the iFIX directory and double click on the file name. It may be useful to run this program from a VBA script whenever a database is loaded to check for collisions in the new database. The following is an example of a VBA script that loads a database, then checks for collisions.

```
Sub Rect1_Click
    ' load a different database

    shell dbbload.exe -qpdb2

    ' need to wait a second or two

    ' run this program to check for duplicates

    shell areaastg.exe
End Sub
```

The program writes the errors to a text file which you can open with Notepad. The output file is named AREAASTAGNAMES.ERR, and is located by default in C:\Program Files (x86)\GE\iFIX\PDB.

## Alarm Area Name Syntax

FIX checks names for correct syntax at startup and when you add or modify area names. Alarm areas can contain up to 30 alphanumeric characters with the exception of a wildcard (\*), single quote ('), or colon (:). Single quotes and colons cannot be used because they are area name delimiters.

If you need to change your alarm area name to comply with this syntax, you must:

- Use the AAD editor to change the invalid area name in the Alarm Area Database (AAD) file. This action updates all the database blocks using that area.
- Change the alarm area used for filtering on alarm destinations in the SCU file (if you have set up filters on a particular alarm area).
- Change the alarm filter string in any pictures containing Alarm Summary links that were filtering on those alarm areas.

If an alarm area name contains characters that are invalid for an iFIX tag name, then you must put single quotes around the area name when using it in data links or animations so that the invalid characters are ignored. For example:

```
FIX32.THISNODE.'area with a space'.A_AREA-_ACK
```

## Alarm Counter Behavior during AAD Mismatch Error

If you receive an Alarm Area Database mismatch error at startup or during database reload, alarm counters may not work correctly.

For information on fixing an AAD mismatch problem, refer to the [Understanding the Alarm Area Database](#) section in this manual.

## Using Auto Alarm Manager

The Auto Alarm Manager allows you to deliver and automatically acknowledge iFIX or FIX 7.x (FIX32) alarms at a central location. The following sections provide information for working with the Auto Alarm Manager (AAM) in iFIX:

- [Introduction to the Auto Alarm Manager](#)
- [Setting Up the Auto Alarm Manager in iFIX](#)
- [Configuring the Auto Alarm Manager Functionality](#)
- [Command Line Options for AAMTCP.exe](#)
- [Troubleshooting the Auto Alarm Manager](#)
- [Using Mission Control to View AAM Statistics](#)

## Introduction to the Auto Alarm Manager



With the Auto Alarm Manager (AAM), you can deliver and automatically acknowledge iFIX or FIX 7.x (FIX32) alarms that occur at remote, un-staffed sites to a central location. From this central location, operators can view the incoming alarms. TCP/IP networking must be enabled to use the Auto Alarm Manager.

The Auto Alarm Manager reports alarms by modem and only maintains the modem connection with the remote node while it reports alarms. After it has delivered all alarms, the Auto Alarm Manager disconnects from the remote node, saving network resources and modem connection time.

The Auto Alarm Manager option also provides the following features:

- Alarm filtering based on alarm area and alarm priority: Low, Medium, and High.
- Alarm reassignment from one alarm area on the Sending node to any alarm area, A-P, (or set of alarm areas) on the Receiving node.
- Automatic acknowledgment after sending alarms to the Receiving node.
- Troubleshooting and diagnostic statistics on the number of alarms sent and received.

The Auto Alarm Manager (AAMTCP.exe) uses Microsoft Remote Access Service (RAS) on top of TCP/IP. This enables you to use the same modem and phone equipment that you use with your Windows RAS Server.

**IMPORTANT:** The Auto Alarm Manager requires RAS software to be installed on each node running the Auto Alarm Manager. Be aware that since the Auto Alarm Manager uses RAS on top of TCP/IP, you must have TCP/IP protocol installed and properly configured on each of your Sender and Receiver nodes.

## Supported Functionality for AAM

The supported functionality for the Auto Alarm Manager (AAM) with TCP/IP is described below.

### Setup Limitations

- All alarm Senders and Receivers must have TCP/IP networking enabled (all nodes must be TCP/IP).
- You cannot use an iFIX Sender node and FIX32 Receiver node. This scenario is unsupported.
- If all Sender nodes are FIX32, then the Receiver node can be either FIX32 or iFIX.
- If all Sender nodes are iFIX, then the Receiver node must be iFIX.
- If the Sender nodes are a mix of FIX32 and iFIX, the Receiver node must be iFIX.

### Configuration Limitations

- Supported configurations are Point-to-Point (node-to-node) and Point-to-LAN configurations.
- The Auto Alarm Manager supports 3 Alarm Priorities: Low, Medium, and High for incoming/outgoing alarms. Additional priorities are not supported. Alarms with a priority of Info and Lolo will not be sent. Alarms with a priority of Hihi or Critical will be sent as High alarms.
- The Auto Alarm Manager supports Alarm Areas A-P. Other configured alarm areas are not supported in the Auto Alarm Manager.

## Networking Considerations

- If you want to upgrade the Auto Alarm Manager on iFIX 4.0 or FIX 7.x nodes to TCP/IP networking, so that these nodes can work with your current version of iFIX, you must download an update from the GlobalCare web site, <https://digitalsupport.ge.com>. Versions earlier than iFIX 4.0 or FIX 7.x do not support the Auto Alarm Manager with TCP/IP networking.

**NOTE:** For iFIX 4.0, you can find this update on the Developer Downloads page, under HMI/SCADA Productivity Packs. For FIX 7.x, look on the Software Downloads page, under SIMs, in the HMI/SCADA - FIX32 section. Refer to the PDF document posted with each download for steps on how to install it.

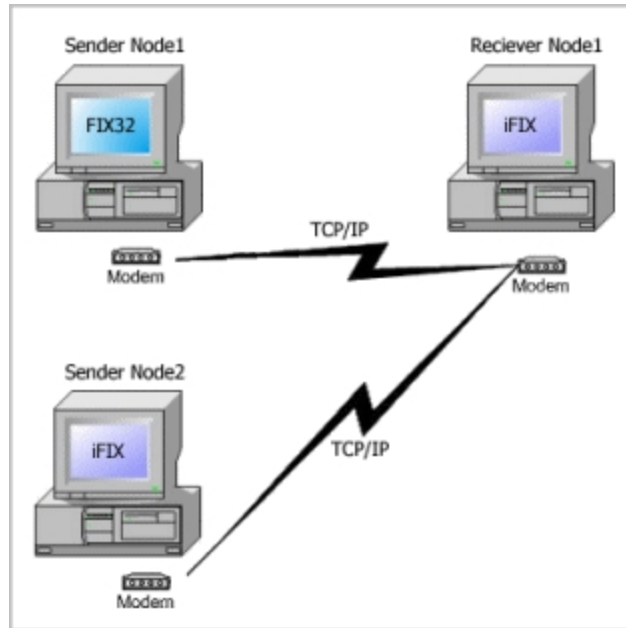
- For FIX 7.x nodes, you must have the original Auto Alarm Manager for NetBIOS (AAM.exe) installed on the computer that you want to use TCP/IP networking with. The original AAM option is available as an add-on option, with a separate install disk.
- iFIX Networking supports the use of only one network protocol at startup. Therefore, FIX 7.x and iFIX 4.0 nodes that you switch to TCP/IP can no longer communicate to nodes using NetBIOS. You cannot run the Auto Alarm Manager with NetBIOS and TCP/IP configured on the same computer.
- For FIX 7.x nodes, the Auto Alarm Manager (AAMTCP.exe) is only supported for Microsoft Windows 2000.
- All alarm Senders and Receivers must have TCP/IP networking enabled. You cannot run both the original AAM for NetBIOS (AAM.exe) and the AAM for TCP/IP (AAMTCP.exe) versions at the same time.
- When you upgrade to TCP/IP networking for either iFIX or FIX 7.x, you are subject to the same runtime security required by iFIX or FIX 7.x Networking. For a mix of iFIX and FIX32 nodes, iFIX Networking with FIX32 rules apply. You may want to re-evaluate your networking settings after the upgrade. For instance, you may want to check what your policy is for accepting unknown hosts and whether you want to disable database write access for unauthorized nodes, as well as other networking options. For more information on iFIX Networking, refer to the Networking iFIX Nodes and Advanced Topics chapters of the [Setting up the Environment](#) e-book. For more on FIX Networking, refer to the FIX32 Network manual.
- The Terminal Server RDP TCP/IP environment is supported with the Auto Alarm Manager.

## Supported Configurations for AAM

The supported configurations for the Auto Alarm Manager (AAM) with TCP/IP are depicted in the following figures.

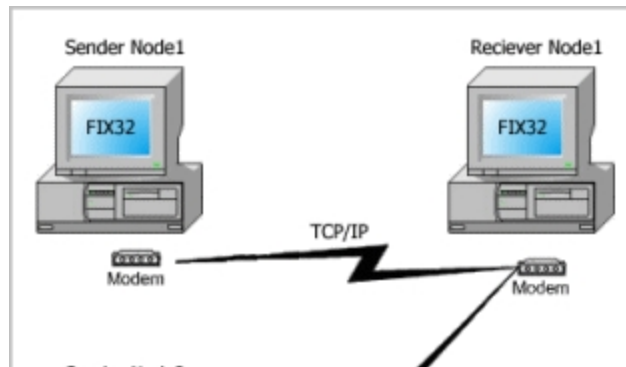
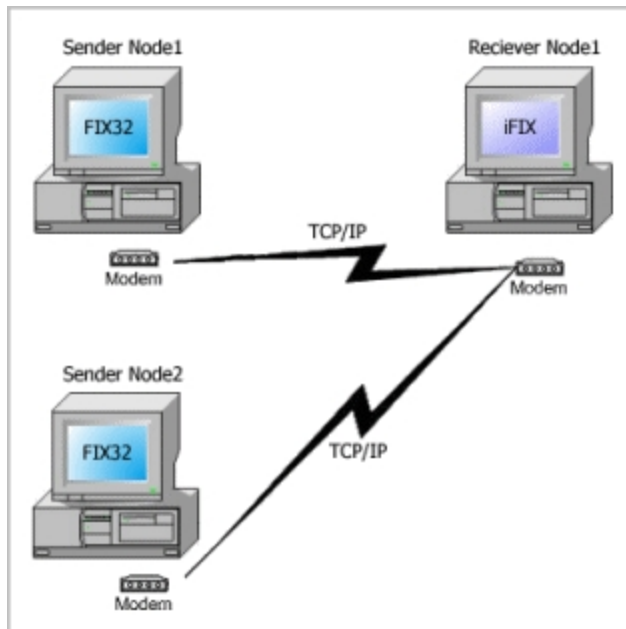
### **Senders: FIX32 & iFIX, Receiver: iFIX**

If the Senders are a mix of FIX32 and iFIX, the Receiver must be iFIX:



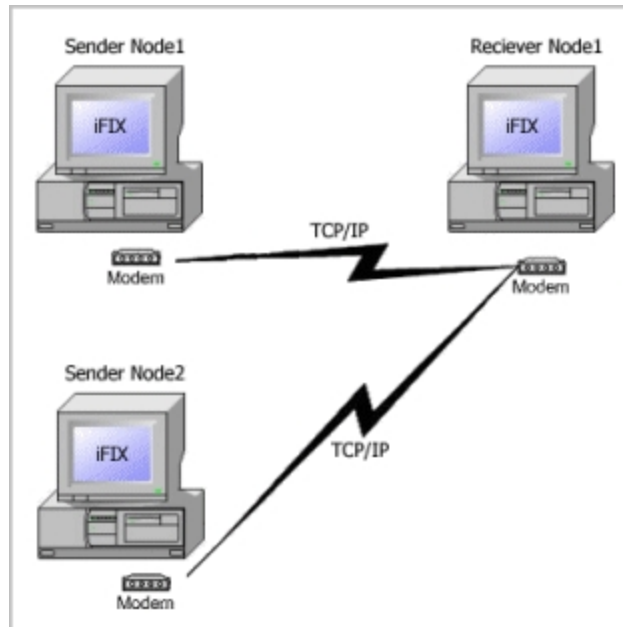
**Senders: FIX32, Receiver: FIX32 or iFIX**

If all Senders are FIX32, then the Receiver can be either iFIX or FIX32:



## **Senders: iFIX, Receiver: iFIX**

If all Senders are iFIX, then the Receiver must be iFIX:



### **IMPORTANT:**

- You cannot use an iFIX Sender and FIX32 Receiver. This scenario is unsupported.
- Nodes that you switch to TCP/IP networking can no longer communicate to nodes using NetBIOS. You cannot run AAM with NetBIOS and TCP/IP configured on the same computer.
- Supported configurations are Point-to-Point (node-to-node) and Point-to-LAN configurations.

## **How the Auto Alarm Manager Works**

The Auto Alarm Manager operates as follows:

1. The Auto Alarm Manager (AAMTCP.EXE) sends alarms by retrieving all the alarms residing in its alarm queue. Messages residing in the alarm queue are ignored.
2. The Auto Alarm Manager filters the alarms by alarm priority and alarm area.
3. The program re-assigns the filtered alarms to the alarm areas you specify in the SCU, and delivers them to the Receiving node.
4. Upon receipt of the alarms, the Receiving node routes them to their alarm destinations based on their new alarm areas. Note that the Receiving node treats the incoming alarms as operator messages. As a result, the alarms do not appear in the Alarm Summary object. After the alarm is successfully delivered to the Receiver node, the Sender node will acknowledge the alarm.
5. After delivering the alarms, the Auto Alarm Manager hangs up the phone and waits a specified amount of time before delivering any more alarms. This delay is intended to let an operator dial into the Sending node and change the conditions that generated the last set of alarms.

## Auto Alarm Manager Error-Handling

The Auto Alarm Manager delivers alarms by dialing a phone number, called the *primary contact*, defined in your RAS phone book. The name of this entry must match the iFIX node name of the Receiver node that the Auto Alarm Manager is dialing. If it cannot connect to the primary contact, (for example, if the line is busy) the Auto Alarm Manager tries a second RAS phone book entry, called the *secondary contact*. The name of this entry must also match the iFIX node name of the node that the Auto Alarm Manager is dialing; however, the secondary contact can be different from the primary contact.

**TIP:** To avoid confusion, it is recommended that your iFIX node name is the same as your computer name. Also, you may need to add the iFIX node name to your Windows HOSTS file. For more information, refer to the [Before You Begin With TCP/IP](#) section in the *Setting up the Environment* e-book.

When the Auto Alarm Manager cannot connect to the primary or secondary contact, it assumes the alarms are undeliverable and does the following:

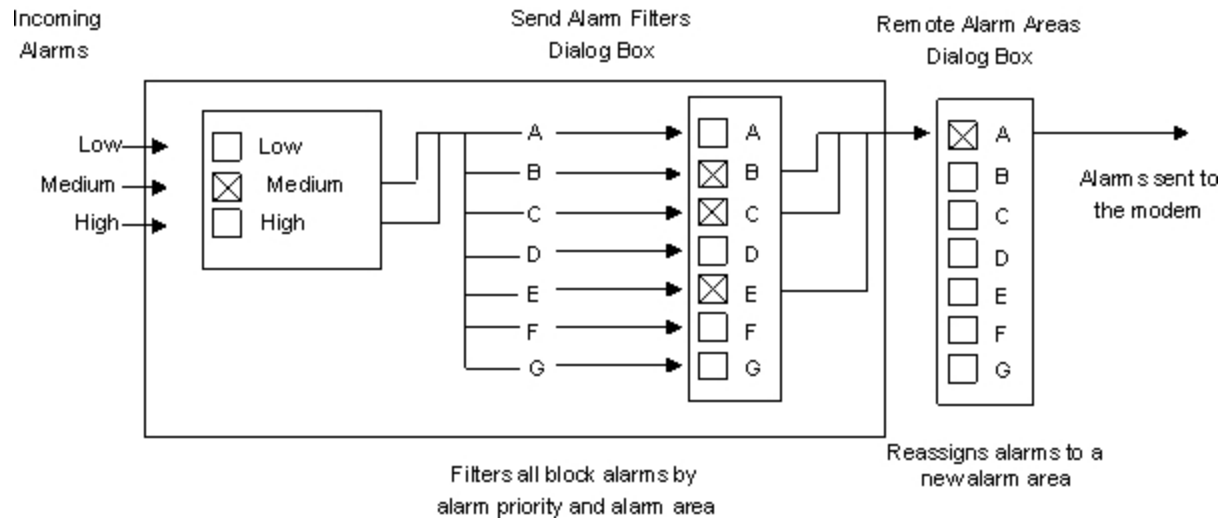
1. Sets a tag in the database (called the *emergency tag*) to 1. This value indicates that the Auto Alarm Manager could not connect to the primary and secondary contacts. Typically, you would use a Digital Output (DO) block type for this tag.
2. Sends a message to all enabled local alarm destinations.
3. Deletes the alarms in its alarm queue. These alarms are not acknowledged; they are removed from the alarm queue because the Auto Alarm Manager cannot deliver them.

**NOTE:** The emergency tag is also set to 1 when the Auto Alarm Manager loses a connection to the Receiving node during delivery and is unable to finish sending all of its alarms.

## Alarm Filtering

With alarm filtering, you can select the alarm areas and priorities that you want delivered from the Sender node to the Receiver node. Assign alarm areas A through P to outgoing alarms. You selectively can reassign these alarms to new alarm areas before they are sent to the Receiving node.

In the following example, only Medium priority alarms in areas B, C, and E are sent to the Receiving node. All other alarms are filtered out. Before these alarms reach the Receiving node, they are remapped to alarm area A.



#### NOTES:

- You can only assign Alarm Areas A through P to incoming/outgoing alarms. Other names from the alarm area database are invalid.
- You can only use Alarm Priority of Low, Medium, or High to incoming/outgoing alarms. Alarms with a priority of Info and Lolo will not be sent. Alarms with a priority of Hihi or Critical will be sent as High alarms.

## iFIX Security and Auto Alarm Manager

**NOTE:** The steps in this section only apply if iFIX security is enabled.

You can configure the Auto Alarm Manager (AAM) to acknowledge its alarms automatically after delivering them to the Receiving node. To do so, you must define the necessary security rights for the Auto Alarm Manager on your Sending nodes. This involves creating a user account, AALARM, with access to all applicable security areas on your SCADA node.

You must define this user account with the same rights on all SCADA nodes so that iFIX security is configured properly. Without these security rights defined, iFIX cannot accept the Auto Alarm Manager's acknowledgments.

## Setting Up the Auto Alarm Manager in iFIX

The following sections provide information on how to set up the Auto Alarm Manager:

- [General Setup Steps for Auto Alarm Manager](#)
- [Setup Steps for AAM, a Dedicated RAS Server, & 2 Modems](#)
- [Upgrading AAM from a Previous Release](#)
- [Notes on RAS and the Auto Alarm Manager](#)

## Before You Begin

Be aware that before you can begin to use the Auto Alarm Manager:

- If you are using iFIX security, you should create a user account with the login name AALARM (all capital letters), on all nodes running the Auto Alarm Manager. In the SCU on each node, assign a password and security areas to the account. For steps, refer to the [Defining Security Rights for the Auto Alarm Manager](#) section in the Setting up the Environment electronic book.
- On the Sender and Receiver nodes, enable the TCP/IP option from the SCU's Network Configuration dialog box. All alarm Senders and Receivers must have TCP/IP networking enabled. For more information, refer to the [Enabling TCP/IP Networking for the Auto Alarm Manager](#) section in the Setting up the Environment electronic book.

**NOTE:** Because FIX and iFIX Networking support the use of only one network protocol at startup, iFIX cannot communicate to nodes using NetBIOS from previous iFIX or FIX releases. You cannot run the Auto Alarm Manager with NetBIOS and TCP/IP configured on the same computer.

If you forget to perform the steps above, the setup steps in the following sections remind you to do so at the appropriate time.

## General Setup Steps for Auto Alarm Manager

This section describes the typical tasks that you must perform to set up the Auto Alarm Manager with TCP/IP in a Point-to-Point Configuration or Point-to-LAN Configuration.

**TIP:** If you plan to use the Auto Alarm Manager with a dedicated RAS Server and two modems, instead, refer to the steps in the [Setup Steps for AAM, a Dedicated RAS Server, & 2 Modems](#) section. A dedicated RAS Server with two modems is a non-typical scenario.

### ► To set up the Auto Alarm Manager:

1. Confirm that you defined the applicable security rights on each node that runs the Auto Alarm Manager. For more steps, refer to the [Defining Security Rights for the Auto Alarm Manager](#) section in the Setting up the Environment electronic book.
2. Install RAS software for the Sending (client) node and the Receiving (server) node. Refer to your Microsoft documentation for instructions.
3. Using your RAS software, create phone book entries for the primary and secondary contacts. The RAS phone book entries for your primary and secondary contacts should be named with the corresponding iFIX node names. Make sure that you enable the TCP/IP protocol for the connection. Refer to your Microsoft documentation for instructions.

### TIPS:

- To avoid confusion, it is recommended that your iFIX node name is the same as your computer name. You may need to add the iFIX node name to your Windows HOSTS file. It is also recommended that you configure your Sender node to provide a static IP address, and that you configure your RAS server to allow the calling RAS clients to provide their own IP addresses.
  - For more information, refer to the [Before You Begin With TCP/IP](#) section in the Setting up the Environment e-book.
4. Install modems on the Sending and Receiving nodes and have the RAS client dial and connect to the RAS server to ensure your RAS software is working.

For more information on RAS, refer to the [Notes on RAS and the Auto Alarm Manager](#) section.

5. On both the Sender and Receiver nodes, configure the SCU's Network Configuration dialog box to support TCP/IP. For steps, refer to the [Enabling TCP/IP Networking for the Auto Alarm Manager](#) section in the Setting up the Environment electronic book.
6. On both the Sender and Receiver nodes, configure the Auto Alarm Manager settings in the SCU:
  - a. In the SCU, on the Configure menu, click Network. The Network Configuration dialog box appears.
  - b. Select the TCP/IP option to enable TCP/IP networking and click OK.
  - c. In the SCU, on the Configure menu, click Auto Alarm Manager. The Auto Alarm Manager Configuration dialog box appears.
  - d. Configure the Sender or Receiver node, by using the top or bottom half of the Auto Alarm Manager Configuration dialog box.

For more instructions, refer to the [Configuring the Auto Alarm Manager in iFIX](#) section.

7. Start iFIX and use Mission Control to monitor the Auto Alarm Manager's operation. For more information, refer to the [Using Mission Control to View AAM Statistics](#) section.
8. After setting up the Auto Alarm Manager, additionally, you should test its operation to ensure it is working as you intended. For more information, refer to the [Troubleshooting the Auto Alarm Manager](#) section.

## Setup Steps for AAM, a Dedicated RAS Server, & 2 Modems

The following steps describe the tasks that you must perform to set up the Auto Alarm Manager when using a dedicated RAS Server and two modems. For more information on this configuration, refer to the [Point-to-LAN Configuration Dedicated RAS Server with Two Modems](#) section.

### ► To set up the AAM using a dedicated RAS Server and two modems:

1. Confirm that you defined the applicable security rights on each node that runs AAM. For more information, refer to the [Defining Security Rights for the Auto Alarm Manager](#) section in the Setting up the Environment electronic book.
2. Make sure your Ethernet card is correctly installed and you are correctly networked using the TCP/IP protocol with the Receiver node (computer).
3. Make sure that you enable the TCP/IP protocol for the Ethernet connection with the Receiver node.
4. Ping the RAS Server and Receiver computers to verify that there is a physical Ethernet connection between the two machines.
5. Install modems on the Sending and Receiving nodes and have the RAS client dial and connect to the RAS server to ensure your RAS software is working.

For more information on RAS, refer to the [Notes on RAS and the Auto Alarm Manager](#) section.

6. Install the RAS software on the Sending (client) nodes and the Receiving (server) node. Refer to your Microsoft documentation for instructions.

### TIPS:

- Make sure that your Incoming Connection's properties has BOTH modems checked and enabled.



- It is recommended that you configure your RAS server to allow the calling RAS clients to provide their own IP addresses. It is also strongly recommended that when you configure your Sender node, that you configure it to provide a static IP address. You may also have to add the Receiver Node Name and IP address to your Windows HOSTS file.
  - For more information, refer to the [Before You Begin With TCP/IP](#) section in the Setting up the Environment e-book.
7. On the Sender node(s), using your RAS software, create phone book entries for the primary and secondary contacts. The RAS phone book entries for your primary and secondary contacts should be named with the corresponding iFIX node names. Make sure that you enable the TCP/IP protocol for the connection. Refer to your Microsoft documentation for instructions.

**TIPS:**

- To avoid confusion, it is recommended that your iFIX node name is the same as your computer name. You may need to add the iFIX node name to your Windows HOSTS file. It is also recommended that you configure your Sender node to provide a static IP address, and that you configure your RAS server to allow the calling RAS clients to provide their own IP addresses.
  - For more information, refer to the [Before You Begin With TCP/IP](#) section in the Setting up the Environment e-book.
8. On the Sender and Receiver nodes, configure the SCU's Network Configuration dialog box to support TCP/IP. For steps, refer to the [Enabling TCP/IP Networking for the Auto Alarm Manager](#) section in the Setting up the Environment electronic book.
9. On both the Sender and Receiver nodes, configure the Auto Alarm Manager settings in the SCU:
- a. In the SCU, on the Configure menu, click Network. The Network Configuration dialog box appears.
  - b. Select the TCP/IP option to enable TCP/IP networking and click OK.
  - c. In the SCU, on the Configure menu, click Auto Alarm Manager. The Auto Alarm Manager Configuration dialog box appears.
  - d. Configure the Sender or Receiver node, by using the top or bottom half of the Auto Alarm Manager Configuration dialog box.

For more instructions, refer to the [Configuring the Auto Alarm Manager in iFIX](#) section.

10. Start iFIX and use Mission Control to monitor the Auto Alarm Manager's operation. For more information, refer to the [Using Mission Control to View AAM Statistics](#) section.
11. After setting up the Auto Alarm Manager, additionally, you should test its operation to ensure it is working as you intended. For more information, refer to the [Troubleshooting the Auto Alarm Manager](#) section.

**IMPORTANT:** Be aware that if one of your Sender nodes is continuously generating many alarms that is, the alarm buffer on the Receiver AAM node has a backlog of alarms and if another Sender tries to connect to the same Receiver node using the second modem, it may fail to connect. The TCP/IP connection may timeout since the Receiver is busy processing the alarms already sent to its (the AAM Receiver's) buffer queue.

## Upgrading AAM from a Previous Release

If you used the Auto Alarm Manager (AAM) in a previous iFIX or FIX 32 release, you still need to follow the steps in the [General Setup Steps for Auto Alarm Manager](#) or [Setup Steps for AAM, a Dedicated RAS Server, & 2 Modems](#) section to setup the Auto Alarm Manager.

Additionally, after you set up the Auto Alarm Manager, you should check the following:

- **SCADA Network Settings** - Make any other networking changes required by your company business rules. When TCP/IP networking is enabled, iFIX Networking rules apply. You may need to make adjustments if any previous rules defined do not apply or require updating.
- **FIX.INI File** - Review the [AUTO ALARM] section of the FIX.INI file. If the queue parameter is included with the AAM.EXE command in this section, you should also include it with the AAMTCP.EXE call in the [AUTO ALARM TCPIP] section.
- **Network Adapter Numbering** - The FIX32 networking modules can only use the first adapter card that is configured in the operating system. If you are using iFIX with FIX32 nodes, you may have to reconfigure the network adapter numbering on FIX32 nodes using lanacfg, if the Sending node has two or more IP addresses. For steps on upgrading FIX32 nodes to work with the Auto Alarm Manager and TCP/IP, refer to the PDF document posted with the update on the FIX32 Software Download page of the GlobalCare web site, <https://digitalsupport.ge.com>.

### Items Not Changed During the Upgrade

The configuration screens for the Auto Alarm Manager do not change with the upgrade, nor does the Mission Control dialog box. So, if you used the Auto Alarm Manager before the upgrade, you **do not** have to go back to the Auto Alarm Manager Configuration dialog box in the SCU for updates.

#### ► To re-evaluate your SCADA network settings:

1. If your AAM Receiving SCADA currently uses the NETWORK.INI file, then add the Sender node to the list in the NETWORK.INI on your Receiving node. To do this:
  - a. Open the NETWORK.INI on your SCADA server using a text editor. If available, this file resides in the iFIX Local path (C:\Program Files (x86)\GE\iFIX\Local, by default).
  - b. Add the Sender node to the list of nodes.
  - c. Check that the settings are acceptable for your business rules. If not, change them. For instance:
    - By default, iFIX nodes accept connections from any remote node over TCP/IP. You may want to **restrict access from unknown or unauthorized nodes** using the accept\_unknown\_host parameter in the NETWORK.INI file. For more information, refer to the "Disabling Connections from Unauthorized Nodes" topic in the [Setting up the Environment](#) e-book.
    - You can also **restrict database write access on a node-by-node basis** using the accept\_unauthorized\_writes parameter in the NETWORK.INI file. When you use this parameter with security areas, database writes are first restricted by security area and then by node. For more information, refer to the "Disabling Database Write Access for Unauthorized Nodes" topic in the [Setting up the Environment](#) e-book.
  - d. Save the file.
2. Review the Networking sections in the iFIX [Setting up the Environment](#) e-book and other iFIX documentation to see if there are other networking changes you'd like to make.
3. If required, add the remote iFIX node names to the Windows HOSTS file, so that iFIX can correctly resolve the remote node name to an IP address. The HOSTS file provides mapping between node names and IP addresses. This text file is stored locally on each node. The

contents of the HOSTS file should be identical on each node in your TCP/IP network. The syntax is as follows:

*address**HOSTNAME*

where *address* defines the IP address of the node, and *HOSTNAME* defines the iFIX node name, as specified in the SCU. The node name must be in uppercase and is limited to eight characters. An example of an entry in the HOSTS file is as follows:

```
198.212.170.4      SCADA01
```

You can also provide an alias name for the host name as an optional third parameter. For more information, refer to the "Before You Begin With TCP/IP" topic in the iFIX electronic books.

**NOTE:** A common mistake made when creating the HOSTS files is leaving an extension at the end on the file name. For example: HOSTS.txt or HOSTS.doc. Do not include a file extension. The name of the file used by the operating system is: HOSTS.

► To update your FIX.ini settings:

1. In Notepad or another text editor, open the FIX.ini file, located in your iFIX LOCAL folder. By default this location is: C:\Program Files (x86)\GE\iFIX\LOCAL.
2. Scroll to find the [AUTO ALARM] section of the FIX.INI file, and take note of any \q command line parameters that appear after the RUN=%AAM.EXE command.

**TIP:** Be aware that the AAMTCP.exe does not use the /s and /c parameters, which can be enabled with the AAM.EXE file. If you see these parameters next to the AAM.EXE call in the [AUTO ALARM] section, you do not have to add them to the AAMTCP.EXE call in the [AUTO ALARM TCPIP] section.

3. Locate the [AUTO ALARM TCPIP] section of the FIX.ini, and add the required command line parameters. For example:

```
[AUTO ALARM TCPIP]
RUN=%WUSERQ1.EXE
RUN=%AAMTCP.EXE
```

**NOTE:** For more information on command line parameters, refer to the [Point-to-LAN Configuration](#) section.

## Notes on RAS and the Auto Alarm Manager

Before the Auto Alarm Manager can deliver alarms via TCP/IP:

- The Sending node(s) must be running the Auto Alarm Manager (AAMTCP.exe) and have a modem attached and properly configured for dialing out.
- The Receiving node must be running the Auto Alarm Manager (AAMTCP.exe) and have an Ethernet adapter.
- RAS software must be installed on each node running the Auto Alarm Manager, as well as the dedicated RAS Server (if you plan to use one). Using RAS, the Auto Alarm Manager can communicate over any TCP/IP LAN adapter, by using iFIX or FIX networking.
- The RAS Server computer must have a modem attached and be properly configured for accepting incoming connections using the TCP/IP protocol over RAS.

- The RAS Server computer must also have an Ethernet adapter that is networked to the Auto Alarm Manager's Receiver node.

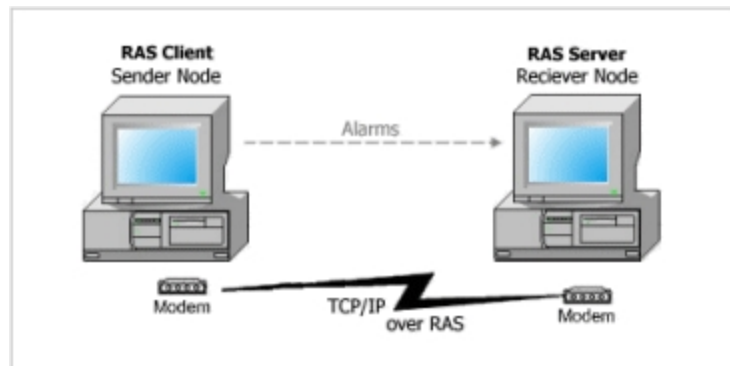
The following sections show different network configurations you can run AAMTCP.exe:

- [Point-to-Point Configuration](#)
- [Point-to-LAN Configuration Typical Scenario](#)
- [Point-to-LAN Configuration Dedicated RAS Server with Two Modems](#)

For general information on setting up a LAN adapter, refer to your Microsoft documentation.

## Point-to-Point Configuration

You can set up nodes in a Point-to-Point configuration so that they communicate over LAN adapter x by opening the Network control panel on the Sending and Receiving nodes, and then configuring the specified LAN adapters shown in the following figure.

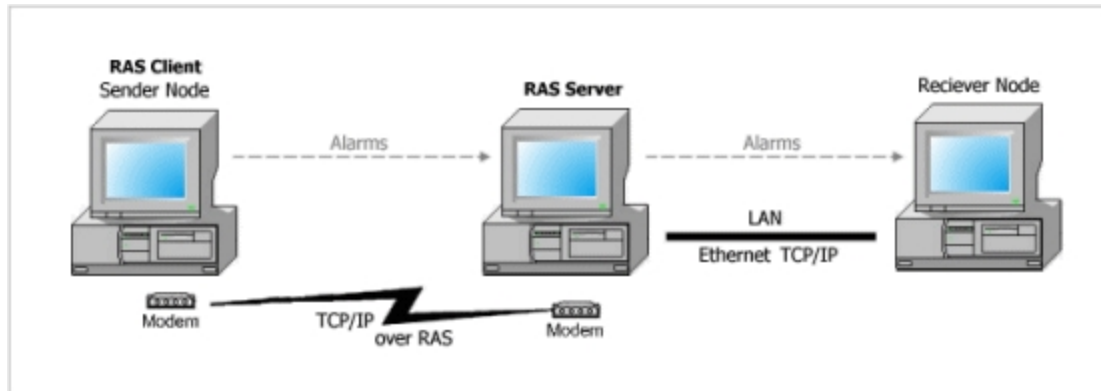


*Point-to-Point Configuration*

**NOTE:** You can use this configuration to dial into the Sending node from the Receiving node. iFIX or FIX is installed on both the RAS Client and RAS Server in this configuration. For more information on valid iFIX and FIX configurations, refer to the "Supported Configurations" section of this document.

## Point-to-LAN Configuration Typical Scenario

Using RAS, you can set up the Sending and Receiving nodes in a Point-to-LAN configuration. The following figure shows how to configure the LAN adapters on the Sending and Receiving nodes. The RAS Server and Receiver node in this diagram both have Ethernet cards.

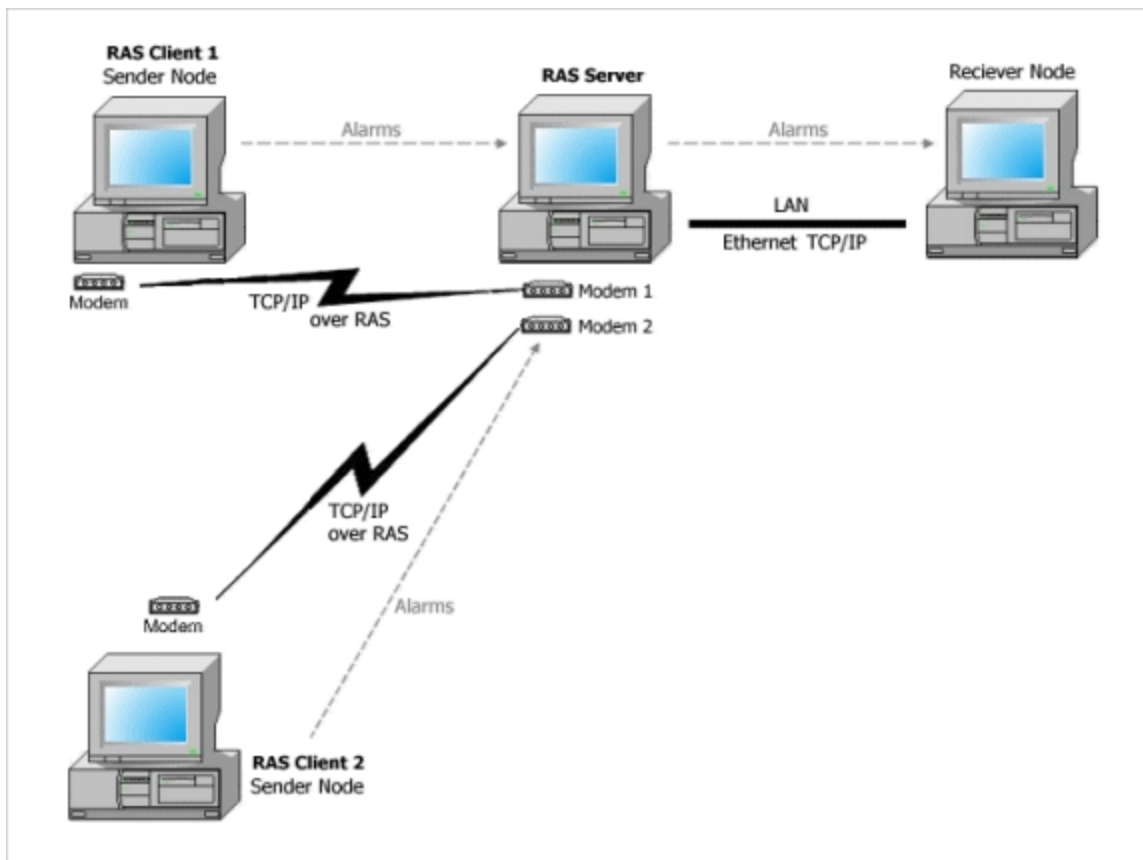


*Point-to-LAN Configuration*

**IMPORTANT:** iFIX or FIX does not need to be running on the RAS server. Use this configuration to set up the RAS server as a gateway for the Receiving node.

### Point-to-LAN Configuration Dedicated RAS Server with Two Modems

The following figure shows how to configure the LAN adapters on the Sending and Receiving nodes when you have a dedicated RAS Server with two modems, in a Point-to-LAN configuration. The RAS Server and Receiver node in this diagram both have Ethernet cards.

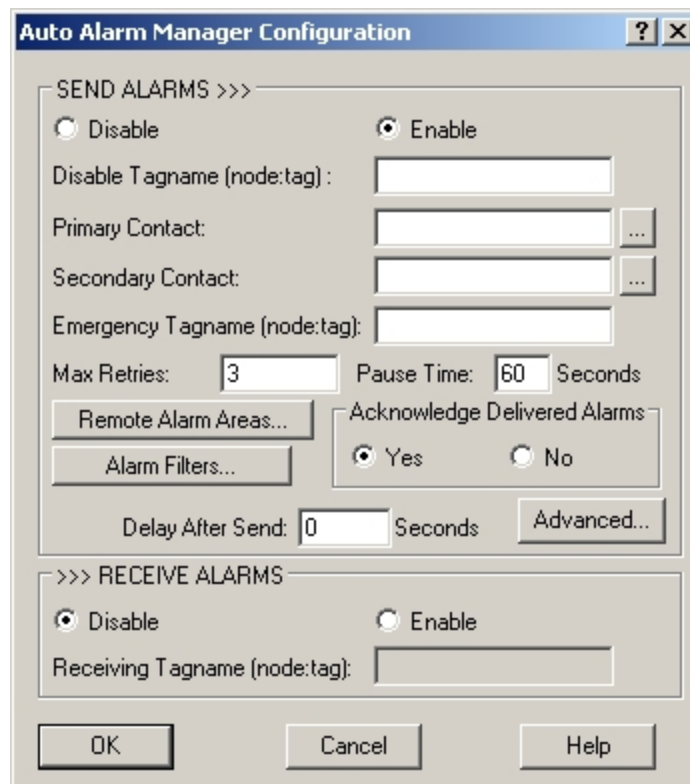


## Point-to-LAN Configuration Using a Dedicated RAS Server Computer with 2 Modems

**IMPORTANT:** iFIX or FIX does not need to be running on the RAS server. Use this configuration to set up the RAS server as a gateway for the Receiving node.

### Configuring the Auto Alarm Manager Functionality

To configure the Auto Alarm Manager in iFIX, use the Auto Alarm Manager Configuration dialog box. In the iFIX SCU, on the Configure menu, click Auto Alarm Manager to open this dialog:

The image shows the 'Auto Alarm Manager Configuration' dialog box. It has a title bar with a question mark and a close button. The dialog is divided into two main sections: 'SEND ALARMS >>>' and '>>> RECEIVE ALARMS'. The 'SEND ALARMS' section has radio buttons for 'Disable' and 'Enable' (selected). Below these are text fields for 'Disable Tagname (node:tag):', 'Primary Contact:', 'Secondary Contact:', and 'Emergency Tagname (node:tag):'. There are also numeric input fields for 'Max Retries:' (set to 3) and 'Pause Time:' (set to 60) with a 'Seconds' label. Buttons for 'Remote Alarm Areas...', 'Alarm Filters...', and 'Advanced...' are present. A checkbox for 'Acknowledge Delivered Alarms' is set to 'Yes'. The 'RECEIVE ALARMS' section has radio buttons for 'Disable' (selected) and 'Enable', and a text field for 'Receiving Tagname (node:tag):'. At the bottom are 'OK', 'Cancel', and 'Help' buttons.

The Auto Alarm Manager Configuration dialog box allows you to enable and configure the Auto Alarm Manager option on either the Sender or Receiver node. The specific fields you complete depends on whether you are setting up the Sending node or the Receiving node. On the Sending node, complete the fields in the Send Alarms area, in the top half of the dialog box. On the Receiving node, complete the fields in the Receive Alarms area, in the bottom part of the dialog box. How you complete the dialog box depends on the type of node you are configuring, as the following table shows.

If you are configuring...	Enter...
The Sending node	<ul style="list-style-type: none"><li>• The primary contact.</li><li>• The secondary contact.</li><li>• The emergency tag to set if alarm delivery fails.</li><li>• The alarm filters you want to assign to incoming alarms. The Auto Alarm Man-</li></ul>

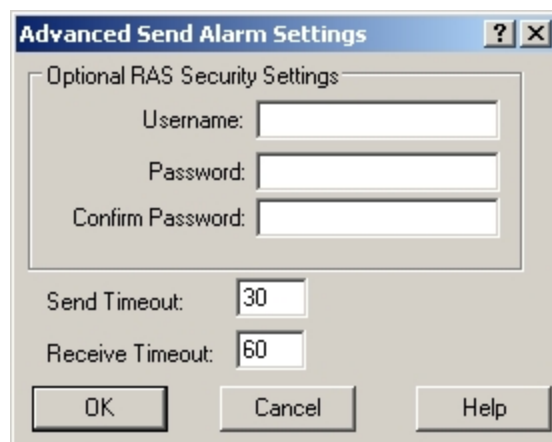
	<p>ager filters the alarms in its alarm queue based on the filters you select, as the figure Filtering Alarms shows.</p> <ul style="list-style-type: none"> <li>• The remote alarm areas you want to assign to outgoing alarms. Note that you can only assign alarm areas A through P to outgoing alarms. Other names from the alarm area database are invalid.</li> <li>• The delay between hanging up the modem, after all alarms are delivered or all retries are exhausted, and dialing the Receiving node when more alarms are queued.</li> <li>• The maximum number of times you want the Auto Alarm Manager to dial the primary or secondary contact.</li> <li>• The pause between each re-dial.</li> <li>• The disable tag. This tag prevents the Auto Alarm Manager from delivering alarms when the tag's value is 1.</li> </ul>
The Receiving node	<ul style="list-style-type: none"> <li>• The <i>Receiving tag</i>. The Auto Alarm Manager sets this tag to 1 when it delivers new alarms. By connecting a Data link to this tag, you can have operators monitor when new alarms are received. You must reset the tag's value to 0 manually after receiving alarms so that operators can determine when the Auto Alarm Manager delivers the next set of alarms.</li> </ul>

**NOTE:** For overview steps on the entire Auto Alarm Manager setup, including RAS, refer to the [General Setup Steps for Auto Alarm Manager](#) section.

## Configuring the Auto Alarm Manager to Run as a Service

When iFIX runs as a service and no one is logged into the operating system, you must specify a Windows user name and password in the SCU for the Auto Alarm Manager on the Sending node. This allows the Auto Alarm Manager to run properly as a service on the Sending node. Otherwise, the Auto Alarm Manager cannot deliver alarms, because it requires the name of the currently logged in Windows user to establish a RAS connection to the Receiving node.

To specify a Windows user account name and password, in the SCU's Configure menu, select the Auto Alarm Manager. In the Send Alarms area, click the Advanced button to open the Advanced Send Alarm Settings dialog box where you can enter a Windows user name and password directly, as shown in the following figure:



**NOTE:** The Windows user account you specify must reside on the RAS server and must have dial-in permission.

## Configuring Auto Alarm Manager Communication Timers

Because communication over a serial modem link can be slow, the Auto Alarm Manager provides two serial communication timers, a Send timer and a Receiver timer. The Send timer defines the number of seconds the Auto Alarm Manager has to send alarms to the Receiving node. The Receiver timer defines the number of seconds the Auto Alarm Manager waits for a response from the Receiving node that the alarms were delivered successfully. If either timer expires, the delivery attempt fails.

You can prevent delivery failures by adjusting one or both timer intervals. By default, the Send timer is 30 seconds and the Receive timer is 60 seconds. You can set both timers to any value from 5 to 120 seconds.

To specify a Sender and Receiver time-out, in the SCU's Configure menu, select the Auto Alarm Manager. In the Send Alarms area, click the Advanced button to open the Advanced Send Alarm Settings dialog box where you can enter these values in the bottom half of the dialog box.

## Command Line Options for AAMTCP.exe

The following table lists the available command line options for the Auto Alarm Manager application using TCP/IP (AAMTCP.exe). You can use these command lines, for instance, to update the [AUTO ALARM TCPIP] section of the FIX.ini.

Command	Description
-B[num]	<p>Allows you to adjust the size of the global string buffer for the messages sent to Mission Control. The [num] variable represents the maximum number of messages to be sent before the buffer begins recycling.</p> <p><b>Example:</b> AAMTCP.exe -B80</p> <p><b>NOTE:</b> If you do not include this command line option, the default global string buffer is 50 messages. In this case, you can see 50 messages in Mission Control before the buffer starts to recycle.</p>
-D[num]	<p>Allows you to specify a delay, in seconds, to wait after stopping the RAS Client or Server (service). The [num] variable represents the number of seconds to wait.</p> <p>The minimum value you can configure is 10 seconds. The maximum is 999 seconds.</p> <p><b>Example:</b> AAMTCP.exe -D30</p> <p><b>NOTE:</b> If you do not include this command line option, the default delay time is the WIN32 delay, typically 200 seconds.</p>
-F	<p>Allows you to flush the user queue when transitioning the Receiver node from Disabled to Enabled. You must have the Receiving Tagname [node:tag] option configured in the SCU in the Auto Alarm Manager Configuration dialog box to use this command line option.</p> <p><b>Example:</b> AAMTCP.exe -F</p>



-L	<p>Allows you to run the AAMTCP over a LAN. When you use this command line option, do not use the RAS dial-up.</p> <p>This option assumes that you have an Ethernet TCP/IP connection already established between the Auto Alarm Manager's Sender and Receiver nodes during iFIX startup.</p> <p><b>NOTE:</b> This feature is supported for iFIX 4.0 and greater; it is not supported in iFIX32.</p> <p><b>Example:</b> AAMTCP.exe -L</p>
-Q[1 / 2]	<p>There are two messages queues that you can use with AAM: WUSERQ1 or WUSERQ2. By default, -Q1 for WUSERQ1 is assumed, whether or not you specify the -Q1 command line option. Otherwise, if you want to specify WUSERQ2, use the -Q2 command to indicate that you want to use the WUSERQ2 message queue.</p> <p><b>Example:</b> AAMTCP.exe -Q2</p> <p>To indicate the size of the queue, add the size value after the WUSERQ1.EXE or WUSERQ2.EXE command line that runs on iFIX startup. For example, in the FIX.ini file, this is how it would look if you wanted to use WUSERQ2 message queue with a size of 5000:</p> <pre>... [AUTO ALARM TCPIP] RUN=%WUSERQ2.EXE 5000 RUN=%AAMTCP.EXE -Q2 ...</pre> <p>To use WUSERQ1 with a queue size of 2000, here is how the FIX.ini file would look:</p> <pre>... [AUTO ALARM TCPIP] RUN=%WUSERQ1.EXE 2000 RUN=%AAMTCP.EXE ...</pre>
-R[num]	<p>Allows you to specify a single digit number for the allowable number of retries for the iFIX TCP/IP networking connection. The [num] variable represents the number of retries.</p> <p>The minimum value you can configure is 1 retry. The maximum is 5 retries.</p> <p><b>Example:</b> AAMTCP.exe -R4</p> <p><b>NOTE:</b> If you do not include this command line option, the default number of retries is 3.</p>
-W[num]	<p>Allows you to specify a double digit number for the maximum allowable wait time between the iFIX TCP/IP networking connection time-out and the retry event. The [num] variable represents the number of seconds.</p> <p>The minimum value you can configure is 10 seconds. The maximum is 99 seconds.</p> <p><b>Example:</b> AAMTCP.exe -W45</p> <p><b>NOTE:</b> If you do not include this command line option, the default number of seconds to wait for an iFIX TCP/IP connection is up to 30 seconds.</p>

#### NOTES:

- When using a command line option, you can preface it with either a dash (-) or forward slash (/). Do not put a space between the dash or forward slash and the command option. If there is a number following the command line option, there should be no space separating the command from the number.

- The command line options are case insensitive; you can use CAPITAL or lowercase letters.
- The command line options do not have to be in any particular order. You can combine as many as you need.

► **To add command line parameters in the FIX.INI file:**

1. Open the FIX.INI file in a text editor, such as Notepad. By default, the FIX.INI resides in the C:\Program Files (x86)\GE\iFIX\LOCAL folder.
2. Locate the [AUTO ALARM TCPIP] section.
3. Locate the following line and add the command line parameters you want to the end of it:

```
RUN=%AAMTCP.EXE
```

For example, to specify the /F parameter, edit the line to match the following:

```
RUN=%AAMTCP.EXE /F
```

4. Save the file.

## Example of Command Line Usage with AAMTCP.exe

This example shows the portion of the FIX.ini file that runs that AAMTCP.exe:

```
[AUTO ALARM TCPIP]
RUN=%WUSERQ2.EXE 5000
RUN=% AAMTCP.exe -B80 -D30 -F -L -Q2 -R4 -W45
```

In this example, the global string buffer is set to 80 messages. After 80 messages appear in Mission Control, the buffer will start to recycle. The delay to wait after stopping the RAS Client or Server (service) is 30 seconds. When transitioning the Receiver node from Disabled to Enabled, the user queue will be flushed.

Additionally, in this example, the Auto Alarm Manager (AAMTCP.exe) can run over a LAN. The WUSERQ2 is specified for the alarm queue, with the maximum queue size set to 5000 messages. The allowable number of retries for the iFIX TCP/IP connection is set to 4. The allowable wait time between the iFIX TCP/IP networking connection time-out and the retry event is 45 seconds.

## More on /L - Using Ethernet (TCP/IP) Instead of RAS Dial-up for Alarm Delivery

Currently, the Auto Alarm Manager's Sender node uses a RAS Dial-up telephone mechanism to connect to the Auto Alarm Manager's Receiver node for the delivery of the alarms. In some cases, you may want to be disable (or bypass) the RAS Dial-up telephone delivery mechanism, so that you can use standard Ethernet (TCP/IP) for the delivery of alarms.

Add the /L command line startup option to the AAMTCP.exe command in the FIX.INI file to disable the RAS Dial-up telephone delivery mechanism. With the /L command, the standard Ethernet TCP/IP connection can be used for delivery of alarms. The Auto Alarm Manager will not try to dial out or establish a RAS connection with the Receiver node. Instead, it will rely on an Ethernet TCP/IP connection that was previously established between the Sender and Receiver nodes during iFIX startup. The rest of the functionality of delivering and acknowledgement of the alarms remains the same as that in the RAS dial-up version.

**IMPORTANT:** The /L feature is supported for iFIX 4.0 and greater; it is not supported in iFIX32.

## Troubleshooting the Auto Alarm Manager

Common issues you may encounter when using Auto Alarm Manager, and their possible solution(s) are summarized below:

### No Ethernet Card Found

If you enabled TCP/IP networking in iFIX, and your computer does not have an Ethernet card, two error messages appear when you start iFIX. You can safely acknowledge both messages. iFIX and the Auto Alarm Manager should still start properly. If not, check your network adapter. It's possible that it does not have the TCP/IP protocol enabled.

### RASAPI32.DLL Not Found

If you start the SCU and receive the following message: Can't find RASAPI32.DLL, try installing the Windows Remote Access Service software on your computer.

### Modem Does Not Hang Up

If the modem on the Receiving node does not hang up when the modem on the Sending node does, you may need to enable Hardware Flow Control and Modem Error Control in your RAS software.

#### ► To enable Hardware Flow Control and Modem Error Control:

1. From the Install Network Software list box, select Remote Access Service.
2. Click Configure.
3. Select the port your modem uses from the dialog box and click Configure.
4. Click Settings.
5. Click the Enable Hardware Flow Control and Enable Error Control check boxes.
6. Close all the open dialog boxes, the Network Control Panel, and restart your computer to ensure that the changes take effect.

### Unable to Add RAS Server to SCU Task List

If you try to add the RAS server to the SCU task list so that it starts automatically with iFIX, you will not be able to do so. The RAS server cannot be added to the SCU task list. Instead, configure the RAS server to start automatically through the Windows Services dialog box.

#### ► To start the RAS server automatically using the Windows Services dialog box:

1. Select Remote Access Server from the Services dialog box and click Startup. The Service dialog box appears.
2. Click Automatic and close all the open dialog boxes and the Service Control Panel to save your changes.
3. Restart your computer to start the RAS server automatically.

## Failure to Connect

If the Auto Alarm Manager fails to connect, you may need to specify the name of a Windows user account that has dial-in permission in the Advanced Send Alarm Settings dialog box. Refer to the Configuring the Auto Alarm Manager to Run Properly as a Service section for instructions.

## Internal Error Messages for AAMTCP.exe

If the Auto Alarm Manager encounters a problem during startup or initialization that it cannot recover from, then a message box appears stating that an internal error occurred with a brief description of the error. For example:

```
User Queue not found - Run WUSERQ1.EXE or WUSERQ2.EXE
E:\Dynamics\AAMTCP.EXE
```

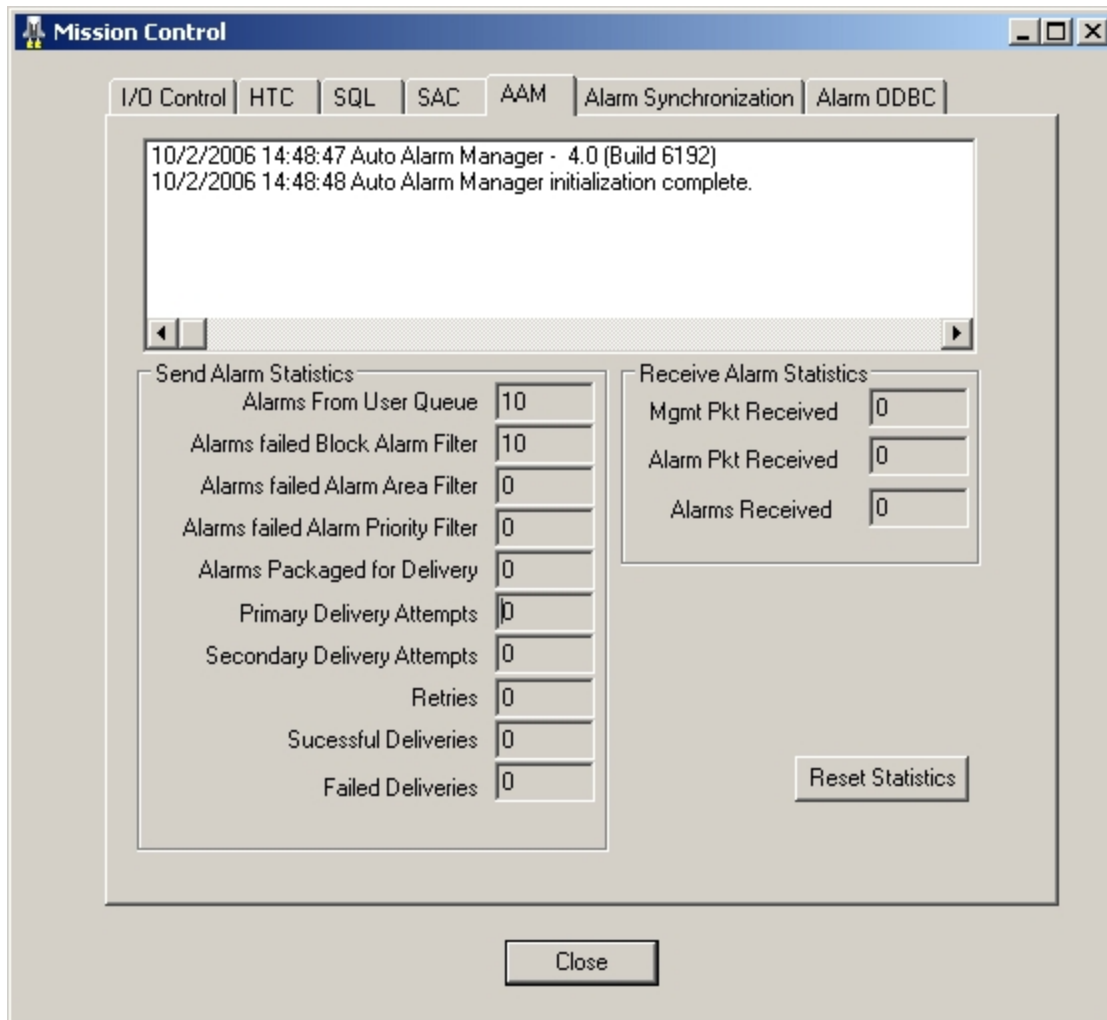
Fatal errors such as these cause the Auto Alarm Manager to shut down. You must resolve the problem and restart iFIX, if you want the Auto Alarm Manager to run properly. The following table lists some of the internal error messages that can occur and possible resolutions.

Message	Solution
User Queue not found - Run WUSERQ1.EXE or WUSERQ2.EXE.	<p>The appropriate user queue could not be found. You do not have WUSERQ1.EXE or WUSERQ2.EXE running.</p> <p>Ensure that you have the appropriate WUSERQ configured with the -Q1 or -Q2 command option. To do so, review the command line options in the [AUTO ALARM TCPIP] section of the FIX.ini.</p> <p>For descriptions of command line options and how to update the FIX.ini, refer to <a href="#">Command Line Options for AAMTCP.exe</a> section.</p>
You must enable FIX networking to use Auto Alarm Manager for TCP/IP.	<p>The TCP/IP networking feature must be enabled in the iFIX or FIX SCU.</p> <p>For instructions on how to enable TCP/IP networking in iFIX, refer to the <a href="#">Enabling TCP/IP Networking for the Auto Alarm Manager</a> section in the Setting up the Environment electronic book.</p>
Can't read Remote FIX configuration from SCU. Have you configured AAM in the SCU?	<p>An error occurred when reading the Auto Alarm Manager configuration information.</p> <p>In the SCU, on the Sender and Receiver node, check the Auto Alarm Manager Configuration dialog box. Ensure that all settings are configured properly.</p> <p>For steps on how to configure the Auto Alarm Manager in the SCU, refer to the <a href="#">Configuring the Auto Alarm Manager in iFIX</a> section.</p>
Auto Alarm Manager is not enabled in the SCU.	<p>The AAMTCP.exe shuts down if it is not configured in SCU to receive or send alarms.</p> <p>In the SCU, on the Sender and Receiver node, open the Auto Alarm Manager Configuration dialog box. Ensure that the Send Alarms or Receive Alarms option is enabled, along with the appropriate options.</p>

	For steps on how to configure the Auto Alarm Manager in the SCU, refer to the <a href="#">Configuring the Auto Alarm Manager in iFIX</a> section.
Error in Acknowledging alarm. No AALARM user found.	<p>iFIX or FIX security is enabled, but you do not have the necessary security rights defined for the Auto Alarm Manager on your Sending nodes.</p> <p>Without these rights, iFIX cannot accept the Auto Alarm Manager's acknowledgments. Verify that the AALARM account exists, and that it is enabled for all security rights.</p> <p>For more information, refer to the Before You Begin: Configure Security Rights.</p>
Error initializing NT security attributes.	<p>A Windows operating system error occurred. Check Windows or your user access rights.</p> <p>For more information, refer to Windows help.</p>
Failed.	The Auto Alarm Manager failed to initialize correctly because this is a PlantTV node, and that type of node not supported.
Failed to post an n_receive().	<p>Confirm that iFIX started correctly, and that networking is enabled and running.</p> <p>For instructions on how to enable TCP/IP networking in iFIX, refer to the <a href="#">Enabling TCP/IP Networking for the Auto Alarm Manager</a> section in the Setting up the Environment electronic book.</p>
osx_glbl_alloc() of Management Buffer failed.	<p>Memory could not be allocated to run the Auto Alarm Manager.</p> <p>Check the following:</p> <ul style="list-style-type: none"> <li>• Confirm that FIX or iFIX started properly and is running.</li> <li>• Ensure that you have enough free memory available on your system.</li> </ul>
System Error: C:\Program Files (x86)\GE\iFIX\TCPTask.exe	This is a non-fatal error. It occurs if you enabled TCP/IP networking in iFIX and your computer does not have an Ethernet card. Two of these error messages appear when you start iFIX.
GetAllWin2KipAddrs() - GetAdaptersInfoSizing Failed with Error	You can safely acknowledge both messages. iFIX and the Auto Alarm Manager should still start properly. If not, check your network adapter. It's possible that it does not have the TCPIP protocol enabled.

## Using Mission Control to View AAM Statistics

The Auto Alarm Manager statistics are displayed in Mission Control so that you can easily monitor the program's progress. Using the AAM tabbed page in Mission Control, you can view run-time messages and troubleshooting statistics in a scrollable window:



The lower portion of the tabbed page contains fields that the Auto Alarm Manager uses to display alarm statistics. As alarms are received from the user queue, the number of the alarms is displayed, and errors relating to the alarms are displayed in the remaining fields from top to bottom. These statistics can help you troubleshoot the sending and receiving of alarms. To reset the displayed values, click Reset Statistics.

Be aware that the Mission control AAM statistics apply to both:

- The Auto Alarm Manager running regularly with the RAS dial-up connection for alarm delivery.
- The Auto Alarm Manager running with Ethernet (TCP/IP) alarm delivery. This is accomplished using the command /L option when you start AAMTCP.exe. For more on the /L command line option, refer to the [More on /L Using Ethernet \(TCP/IP\) Instead of RAS Dial-up for Alarm Delivery](#) section.

For detailed descriptions of the fields in this window, refer to the [Auto Alarm Manager Tabbed Page Fields](#) section.

#### ► To open Mission Control:

1. In Classic view, click the Mission Control button on the Application toolbar.

-Or-

In Ribbon view, on the Applications tab, in the Utilities group, click Mission Control.

-Or-

Select Mission Control from the iFIX WorkSpace system tree.

2. Click the AAM tab.

**NOTE:** Before the Auto Alarm Manager can deliver alarms, both the Sending and the Receiving nodes must be running the Auto Alarm Manager and must have a modem attached and properly configured for dialing out (on Sender nodes) or accepting incoming connections (for Receiver nodes) using the TCP/IP protocol over RAS.

## Messages Appearing in AAM Tab of Mission Control

The following table details possible messages that the Auto Alarm Manager may display during its operation, and lists potential solutions to the problem that the messages convey. These messages appear in the top half of the AAM tab in the Mission Control window.

**Troubleshooting Auto Alarm Manager Messages in Mission Control**

Message	Solution
Cannot find the phone book entry	The primary or secondary contact specified in the SCU is not defined in the RAS phone book. Create a phone book entry for each contact before continuing. Refer to your Microsoft manuals for instructions.
Hardware failure in port or attached device	The Auto Alarm Manager cannot communicate with the local modem. Verify that the cable connection between the modem and the computer is secure. If the problem persists, try a different cable or modem.
Cannot detect carrier	The Auto Alarm Manager could not establish a connection to the Receiving node. Make sure the RAS server is running. Also make sure the local modem detects a dial tone when it dials the primary or secondary contact.
ERROR_INTERACTIVE MODE	Do the following: <ol style="list-style-type: none"><li>1. Select the phone book entry you want to edit.</li><li>2. From the Remote Access dialog box, click Edit. Click Advanced. If the Basic button appears, proceed to the next step.</li><li>3. Click Modem.</li><li>4. Clear the Enter Modem Commands Manually check box.</li><li>5. Close all open dialog boxes and exit the Remote Access program. The next time the Auto Alarm Manager dials, you should not receive an error.</li></ol>
Testing the connection... Connection BAD	After establishing RAS and iFIX connections, the Auto Alarm Manager on the Sending node sent a test message to the Receiving node and did not get a response. Make sure that Auto Alarm Manager is running on the Receiving node. If it is not, start it.
The account does not have remote access permission	The currently logged in user or the name of the user account specified in the Advanced Send Alarm Settings dialog box does not have the necessary rights to dial into the RAS server. Use the RAS Administrator program on the server node to grant dial-in rights to the necessary users.
All AAM session	The Auto Alarm Manager could not communicate with the Auto Alarm Man-

attempts failed	<p>ager on the remote node. Make sure the following conditions exist:</p> <ul style="list-style-type: none"> <li>• The names of the primary and secondary contacts match the names of remote nodes associated with each RAS phone book entry. If they do not, edit the entries. Refer to your Microsoft manuals for more information.</li> <li>• The Auto Alarm Manager is started with the correct command line parameter on the Sending and Receiving nodes. Use the /c parameter on the Sending node and the /s parameter on the Receiving node. Refer to the <a href="#">Command Line Options for AAMTCP.exe</a> section for more information.</li> <li>• The Sending and Receiving nodes are not on the same LAN.</li> </ul>
Error 1311 setting emergency tag	<p>The Auto Alarm Manager could not set the specified Emergency tag configured in the SCU. Some of the reasons for this could be:</p> <ul style="list-style-type: none"> <li>• The specified TAG does not exist in the database.</li> <li>• The specified NODE does not exist or is not reachable.</li> </ul>
Error 1311 setting receive tag	<p>The Auto Alarm Manager could not set the specified Receive tag configured in the SCU. Some of the reasons for this could be:</p> <ul style="list-style-type: none"> <li>• The specified TAG does not exist in the database.</li> <li>• The specified NODE does not exist or is not reachable.</li> </ul>
Disable tag can't be read	<p>The Auto Alarm Manager could not read the specified Disable tag configured in the SCU. Some of the reasons for this could be:</p> <ul style="list-style-type: none"> <li>• The specified TAG does not exist in the database.</li> <li>• The specified NODE does not exist or is not reachable.</li> </ul> <p>If you get this error, the AAM will keep running, and it cannot be disabled.</p> <p><b>NOTES:</b></p> <ul style="list-style-type: none"> <li>• The AAMTCP.exe can only read from or write to a database tag on a <u>local</u> iFIX node. You cannot read or write to remote nodes. In other words, you cannot disable the Auto Alarm Manager from a tag on a remote node; it will always be running.</li> <li>• You cannot set an Emergency tag or Receive tag on a remote node. It has to be on the same (local) node which the AAMTCP.exe is running on.</li> <li>• You cannot acknowledge an alarm that comes from a remote node. For the alarm to be acknowledged, it has to be from the same (local) node that the AAMTCP.exe is running on. If it is not, the alarm will still be sent to the Receiver node, but will not be acknowledged by the Sender node.</li> </ul>

## Advanced Topics



This chapter explains how alarm queues work and how you can optimize performance by resizing them. The chapter also describes how iFIX time-stamps alarms, as well as how to configure the Auto Alarm Manager option. Refer to the following sections for more information on these advanced tasks:

- [Understanding Alarm Queues](#)
- [Understanding Time Stamps](#)

## Understanding Alarm Queues

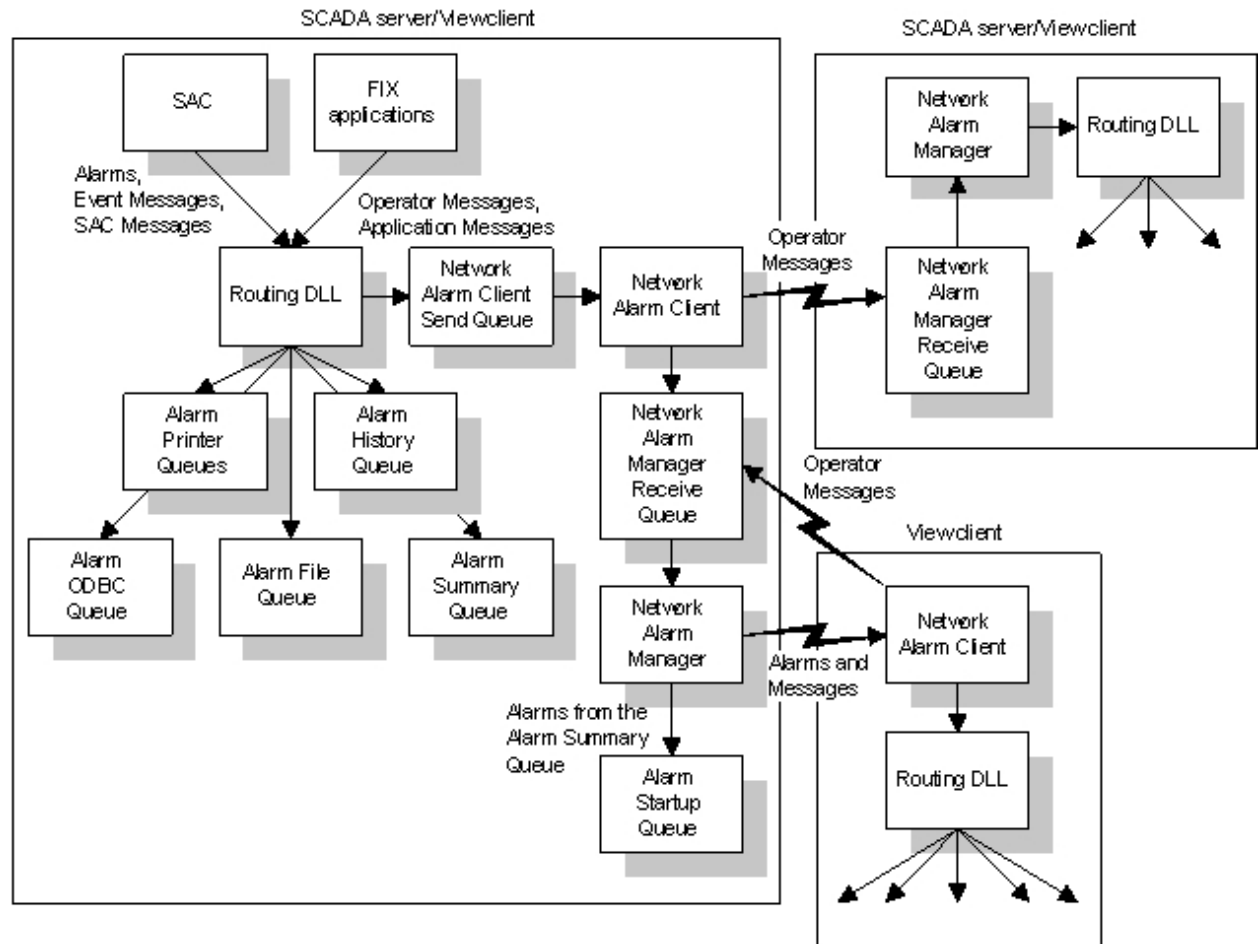
Associated with each alarm service is an *alarm queue*. Each alarm queue stores the alarms and messages received by the local computer. In general, the interaction between an alarm service and its alarm queue is as follows:

1. The alarm service reads an alarm or message from its queue.
2. The alarm service processes the data. For example, the Alarm File Service writes the data to a file.
3. The alarm or message is deleted from the queue.

## Understanding Network Alarm Queues

The Alarm Network Service routes alarms and messages to the appropriate alarm queues using its two components: the Network Alarm Manager and the Network Alarm Client. To distribute the alarms to other nodes, the Network Alarm Manager on a SCADA server and Network Alarm Client on a View client establish communication using their control queues. The View client starts the process by sending a request for alarms to the Network Alarm Manager's control queue on the SCADA server. The server responds by sending an acknowledgment to the Network Alarm Client's control queue.

This process is called *handshaking*. Before iFIX can route alarms and messages over the network, handshaking must occur so that iFIX can synchronize the computers for network communication. Once the handshaking is complete, iFIX routes alarms and messages to the View client, as the following figure shows.



*Alarm Queue Interaction*

## Alarm Queue Sizes

By default, iFIX sets the size of each queue to the values shown in the following table.

The...	Saves up to...
Alarm Printer 1, 2, 3, and 4 queues	100 alarms and messages
Alarm File queue	
Alarm ODBC queue	
Alarm Summary queue	200 alarms
Alarm Startup queue	
Alarm History queue	100 alarms and messages
Network Alarm Client Send queue	100 alarms and messages
Network Alarm Manager Receive queue	

## Modifying the Alarm Queues

You may find that certain alarm queues require more space than their default size. You can prevent alarm loss by adjusting the size of these queues. For example, suppose you find that the maximum size of the Alarm Summary queue on a View client should be 300 alarms.

By changing the queue size in the SCU, you allow iFIX to allocate all the memory needed for the queue at start-up. This eliminates the possibility of losing alarms later. Each queue can hold up to 32,767 alarms.

## Understanding Time Stamps

Included with every alarm and message is a *time stamp*. The time stamp indicates the time and date that the alarm or message was generated. Using this information can help you fine-tune your process. Time stamps can come from the local computer time, OPC server time, or your process hardware's clock, as the following table describes.

If you have an...	iFIX...
iFIX I/O driver 6.x or earlier	Automatically time-stamps all alarms and messages using the local computer time.
iFIX I/O driver 7.x or later	Does not time-stamp the alarms. Instead, your process hardware or I/O driver time-stamps the process data sent to your SCADA servers. iFIX uses this time stamp for the alarms it generates.
OPC server	Does not time-stamp the alarms. Instead, the OPC server or the OPC client time-stamps the process data. iFIX uses this time stamp for the alarms it generates.

Not all process hardware or OPC servers support time stamping. If your equipment or server does, you may want to enable it. However, you must verify that the local computer time on each SCADA server and the process hardware/OPC server time are synchronized. For information on synchronizing both clocks, refer to your process hardware, OPC server, or I/O driver manuals.

If your process hardware does not support time stamping or if no OPC server is available, the iFIX OPC client or I/O drivers (7.x or later) automatically time-stamp data with the local computer time before sending it to your SCADA servers. The exact type of time stamping depends on the I/O driver. Refer to your I/O driver manuals for more information.

Once your process data is time-stamped, the following database blocks incorporate the time supplied into their alarms:

- Analog Alarm
- Analog Input
- Digital Alarm
- Digital Input
- Text

The blocks also save the time stamp in the A\_OPCTIME field. Refer to the section [Adding Data Links to Pictures](#) for more information about this field.

Device Control and Multistate Digital Input blocks also time-stamp the alarms they generate. Their time stamp indicates when the block calculated its output. This time is based on the SCADA server's clock.

## Alarm Summary Time Stamps

The Alarm Summary object supplies two time stamps: Time In and Time Last. Time In is the time the alarm was first generated. Time Last is the time that the block last generated an alarm.

Obviously, if a block re-issues an alarm for a block, the two time stamps will not match. Depending on your configuration, these time stamps will be the OPC time or the local computer time.

## Time-stamping iFIX Output

iFIX also supports message time stamps for process value changes. These changes occur when:

- An operator changes a value in an Analog Output, Digital Output, or On-Off Control block.
- An Analog Register or Digital Register block writes data to an I/O point.

In both cases, iFIX time-stamps these messages with the local computer time and saves it in the A\_OPCTIME field.

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