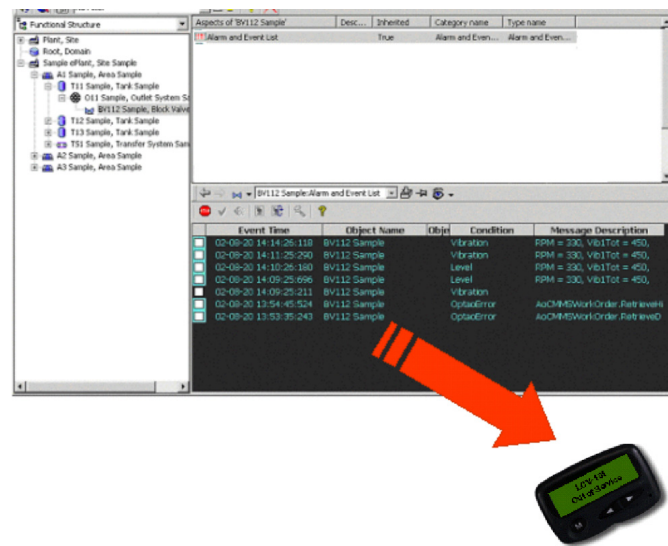


Features and Benefits

- Alarm conditions sent directly to various devices:** Messenger Service sends messages with alarm information to pagers, mobile telephones, and e-mail accounts configured to receive them.
- Configurable user groups:** Place individual users in groups so that only members of that group receive desired messages. Make users members of any or all groups.
- Alarm grouping:** Define groups of events to be sent to the same group of people.
- Message handler:** Allows specification of message source and destination, time to wait for acknowledge before resending, and number of attempts before changing destination (based on configurable priority).
- Message scheduling:** Allows configuration of times of day and days of week that each user receives messages.
- Flexible message format:** Specify message content, length, etc.



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The Messenger Service consists of the Asset Optimizer Server and Messenger system extensions to Operate^{IT}™ Process Portal A. It includes aspect systems and other components that are packaged for installation on Process Portal A.

When the Messenger Service is added to Process Portal A, it provides the opportunity to send messages based on alarm and event information to user devices such as mobile telephones, pagers, and e-mail accounts. Text messages can be sent to pagers and mobile telephones via the Email Device or Modem Device. The Messenger Service is easily customized for specific application requirements.

A block diagram of the Messenger Service is shown in Figure 1. It shows the data flow from the time the Alarm and Event List is notified of an event. The Messenger Service consists of several components (refer to *Messenger Service Components*). When an alarm is generated, it is sent to the Alarm and Event List. A Messenger Service component, the Alarm and Event Message Source, monitors the Alarm and Event List associated with it. When it senses an event it formats a message (based on configured values) and sends the message to the Message Handler. The Message Handler sends the message to destinations (individual users or user groups) subscribed via the Message Subscriber.

The Message Schedule determines which users receive messages based on their schedule. If it determines a user is scheduled to receive a message via modem or e-mail, the message is sent to that user.

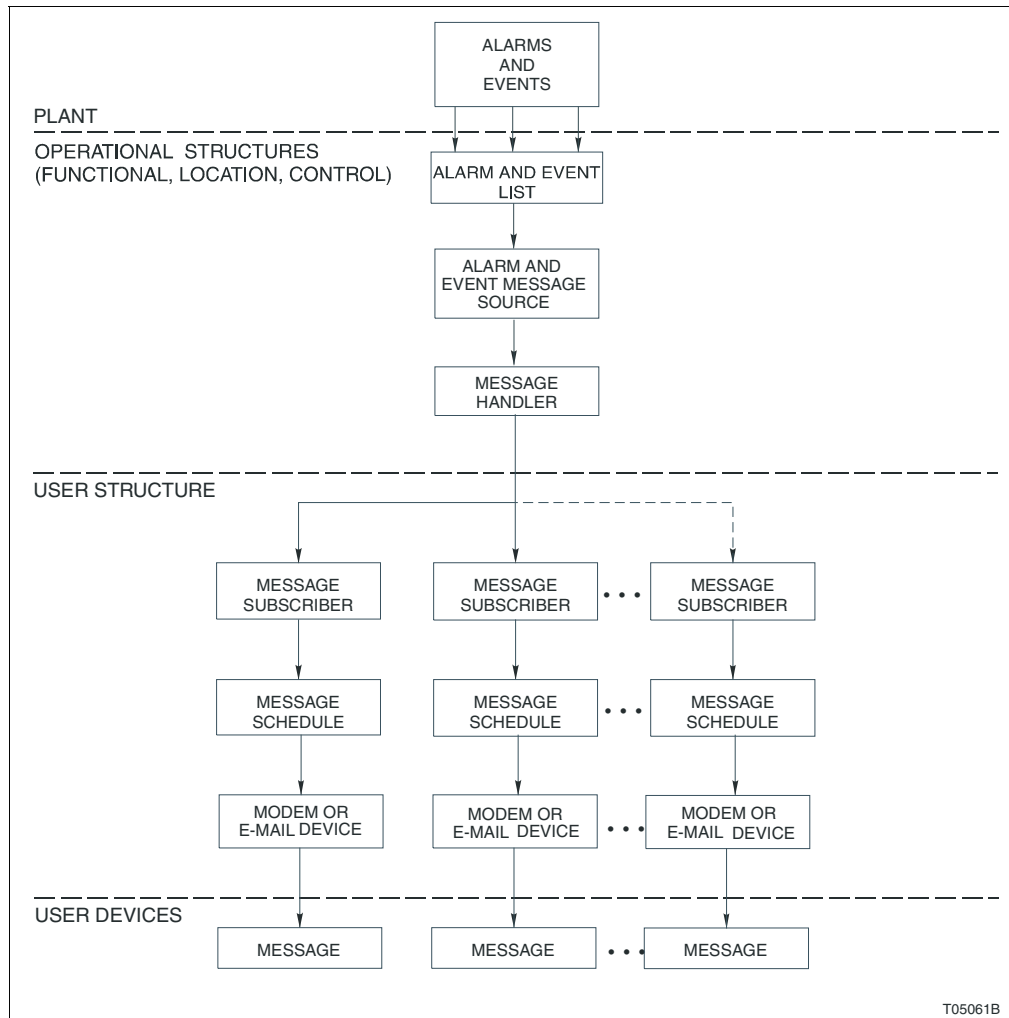


Figure 1. Messenger Service Block Diagram

Messenger Service Components

The Messenger Service contains the following components that can be added to objects in the Process Portal A product structures:

- Alarm and Event Message Source.
- Message Handler.
- Message Subscriber.
- Message Schedule.
- Modem Device.
- Email Device.
- Notification Log.

Alarm and Event Message Source

The Alarm and Event Message Source allows the user to select the Alarm and Event list to monitor, the content of alarm and event messages, and edit the message field length.

Message Handler

The Message Handler allows the user to select the Alarm and Event Message Source, the message destination, and configure other parameters.

The message is sent to the top destination first. If the message is successfully sent and the user acknowledges the alarm within the configured time limit and/or number of attempts, the rest of the destinations do not receive the message. If the user does not acknowledge the alarm line corresponding to the message within the timeout interval, the message is sent again provided the attempts parameter is greater than one. If the attempts count on the first destination is exhausted without acknowledgement, the Message Handler moves to the next destination in the list (if there is one). If the destination is a group, the message is sent to the device with the highest priority for every group member before timing begins; however, the lower priority devices do not receive messages. Acknowledgement of the alarm by one member of the group is considered successful notification of the entire group.

Message Subscriber

The Message Subscriber identifies users who receive event messages, specifies devices available to each user, and configures those devices.

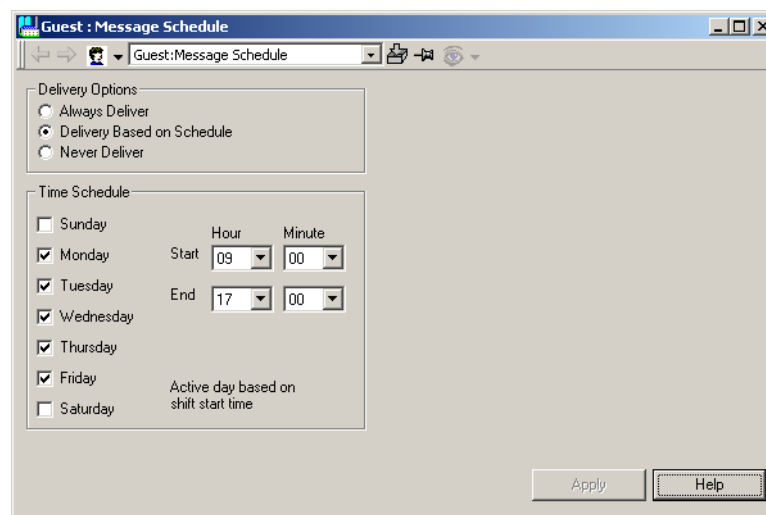
Message Schedule

The Message Schedule allows the user to schedule the days of the week and the time period each user will receive event messages.

The Message Schedule is configured for each user with the following options:

- Always Deliver: User receives messages 24 hours a day, 7 days a week.
- Delivery Based on Schedule: User receives messages on scheduled days of the week and time range for those days.
- Never Deliver: User receives no messages.

Figure 2 shows a configuration where the user receives messages Monday through Friday between the hours of 9:00 AM and 5:00 PM (17:00).



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Figure 2. Message Schedule

Modem Device

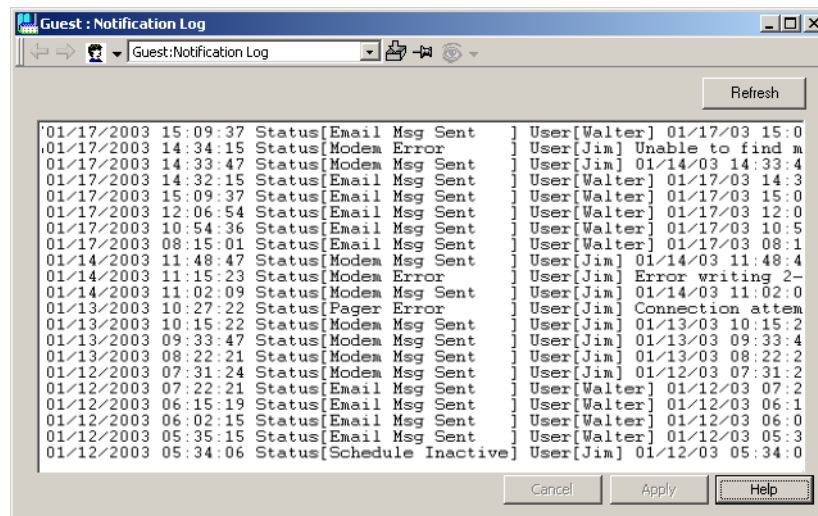
The Modem Device allows specification of the paging device (pager or mobile telephone capable of receiving text messages) access information. The Phone Number: field contains the toll-free telephone number for the provider's central paging terminal. The PIN: field contains the 10-digit personal number for the current user.

Email Device

The Email Device contains the user's e-mail address (usually in the format of pin@provider, e.g. 599154@SkyTel.com) where messages are sent. It also contains the e-mail address that appears in the From: field where error messages may be sent (e.g. delivery failure).

Notification Log

The Notification Log is a circular log of the last 500 notification events. It provides more diagnostic information than is available in the **Log** tab in the Message Handler. It contains information on how many messages were successful, why a user did not receive a message (e.g. they are not on schedule), and the reasons why a message was not successfully sent (e.g. wrong PIN, service not accessible, modem not turned on, etc.). Figure 3 shows a sample Notification Log.



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Figure 3. Notification Log

Asset Optimizer Server

The Asset Optimizer Server system extension consists of a base functionality that is common to more than one system extension (Messenger Service, CMMS Connectivity, Asset Monitor Environment).

The Asset Optimizer Server system extension consists of the Asset Tree aspect system, which consists of the following aspects:

- **ACTViewer (Asset Condition Tree Viewer).**
- **ACTReporter (Asset Condition Tree Reporter).**

The Asset Condition Tree shows the status of associated plant objects (assets) based on Plant Explorer hierarchies. Assets can be control system hardware components, control system

networks, control system devices, fieldbus networks, fieldbus components, machines, pumps, motors, process equipment (boiler, reactor), etc.

Asset Condition Tree indicators propagate the most severe condition up the Asset Condition Tree. Asset Condition Tree indicators distinguish the level of severity using OPC and Asset Monitor severity range (1 to 1,000). Each Asset Condition Tree indicator represents composite severity of an object and all children beneath the object for the current structure.

In addition to displaying composite severity for each asset, the Asset Condition Tree displays, and propagates up the tree, the quality of the condition (or the Asset Monitor itself, i.e. bad configuration or not downloaded), as well as fault report availability. Fault report availability is indicated by bold text. Quality has three states:

- Good: Displays only Asset Condition Tree indicator.
- Bad: Displays Asset Condition Tree indicator plus X.
- Uncertain: Displays Asset Condition Tree indicator plus ?.

Table 1 shows and describes the Asset Condition Tree severity indicator icons.

Table 1. Asset Condition Tree Severity Indicator Icons









Icon	Description
	No ACTReporter or Asset Monitor associated with the asset.
	Normal subcondition.
	Non-normal subcondition with severity between 0 and 250.
	Non-normal subcondition with severity between 251 and 500.
	Non-normal subcondition with severity between 501 and 750.
	Non-normal subcondition with severity between 751 and 1,000.

Table 2 shows and describes the quality indicator overlay icons that appear over the Asset Condition Tree severity indicator icons to represent quality.

Table 2. Quality Indicator Overlay Icons

Icon	Description
	Uncertain quality.
	Bad quality.

ACTViewer (Asset Condition Tree Viewer)

The ACTViewer (Figure 4), when added to an object, allows the Asset Condition Tree to be displayed. When displayed, the Asset Condition Tree shows the condition of that object and all its children. The Asset Condition Tree visually indicates the presence of a fault report by displaying items in bold text. Context menus permit fault report submission directly from within the ACTViewer. Right-clicking on the item of interest produces a context menu such as the one shown in Figure 4.

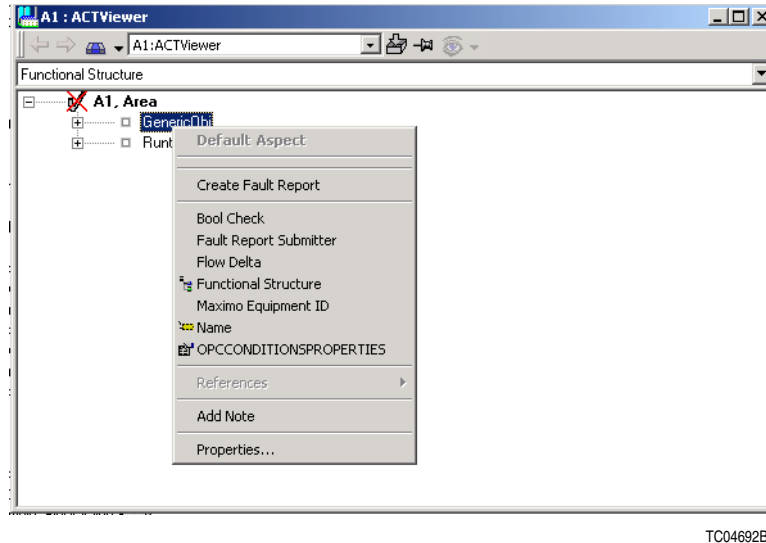


Figure 4. ACTViewer

The ACTViewer is accessible within the Plant Explorer Workplace on the Asset Optimizer Server and rich client Asset Optimizer Workplaces. It is also accessible on thin client Asset Optimizer Workplaces. When the ACTViewer is active in the Plant Explorer Workplace in the rich clients, the status of the assets in the view update automatically when values change. Thin client views require a manual refresh to update the view.

ACTReporter (Asset Condition Tree Reporter)

The ACTReporter (Figure 5) is a detailed view of an asset condition. It displays the severity indicator for an object itself. It displays information available to it from all Asset Monitors and their corresponding current subconditions. For each condition, the ACTReporter will provide information about current subconditions, severity, Asset Monitor status, fault report availability, and work order availability. Right-clicking on the item of interest produces a context menu such as the one shown in Figure 5.

Table 3 lists the color scheme that appears in the **Severity** column of the ACTReporter and how the colors relate to the subcondition severity levels.

The ACTReporter must be added to each object that needs to be propagated up the Asset Condition Tree in the ACTViewer.

The ACTReporter is accessible within the Plant Explorer Workplace on the Asset Optimizer Server and rich client Asset Optimizer Workplaces. It is also accessible on thin client Asset Optimizer Workplaces. When the ACTReporter is active in the Plant Explorer Workplace, the status of the assets in the view update automatically when values change. Thin client views require a manual refresh to update the view.

Severity	AM Name	Condition	SubCondition	Description	TimeStamp	QualityStatus	Fault Report
1	Running Time Check	Runtime Limit Reached				badOutOfService	
1000	Flow Delta	FlowDelta	LimitExceeded	Flow delta exceeded allowable limit of 5.0%	2003-04-01 15:15:56	good	
1	HighLow Limit Check	HighLimit	Normal	Normal	2003-04-01 15:15:55	good	
500	HighLow Limit Check	LowLimit	LowOffset	Low offset limit reached	2003-04-01 15:15:55	good	
1	XY Profile Deviation	Reference Profile Deviation				badOutOfService	
1000	Bool Check	State	Alarm		2003-04-01 15:15:53	good	Available
1	Bad Qu Check	Fault Report Submitter Create Fault Report Condition Details: State Asset Monitor Status		Asset Parameter 'ExecutionsRequiredForTrigger' must be an integer >= 1.	2003-04-01 15:15:54	badConfiguration Error	

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Figure 5. ACTReporter

Table 3. ACTReporter Color Scheme

Color	Subcondition Severity Level
Gray	Normal
White	1 to 250
Blue	251 to 500
Yellow	501 to 750
Red	751 to 1,000

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