

**Experion Process Knowledge
System (PKS)**

**Experion Station Specifications and
Technical Data**

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Experion Station Specifications and Technical Data

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Revision History

Revision	Date	Description
1.0	November 2004	Release Revision

Legend for Change column:

A -- Added
D -- Deleted
M -- Modified

Introduction

Experion Process Knowledge System

The Experion™ Process Knowledge System (PKS) is the next-generation process automation system that unifies people with process, business and asset management to help process manufacturers **increase profitability and productivity**. It is the only process automation system to focus on people – making the most of the knowledge they hold. Experion **improves business performance and peace of mind** by collecting and integrating process and business data across the entire facility, making information and knowledge available where and when needed, thereby enabling people to make the right decisions. At the heart of the Experion PKS is the **Experion platform**, which provides a foundation for integrating all process control and safety management (including non-Honeywell systems) into a single, unified architecture. The Experion platform embeds **advanced applications** to improve process performance, asset and people effectiveness and business agility.

Experion Platform

The Experion™ platform provides the foundation for the Experion Process Knowledge System (PKS), integrating all process control and safety management (including non-Honeywell systems) into a single, unified architecture. Robust and scalable, the Experion platform is built on Honeywell's 30 years of experience in delivering process control and safety system expertise. It takes customers well beyond Distributed Control System capabilities by providing next generation automation control through embedded decision support and diagnostic technology that drives information to the decision maker. The safety component maintains the security of an independent environment from the mainline control system, increasing security and system dependability. The result is a **unified automation platform** that elevates safety and process availability, as well as production and profitability.

Architecture Overview

Experion PKS comprises many different integrated hardware and software solutions depending upon the needs of the installation. Figure 1 is a representation of many of the possible nodes that can be utilized in the Experion architecture. Note that the architecture is highly scalable and not all nodes are necessary or required.

Station Overview

This document details the specifications and technical data for the Experion Station hardware and software. Experion Station is a powerful operator interface that can be utilized in different forms for different functions around a plant or mill. For example, the Experion Station may be used by an operator for around the clock system operation or by a maintenance technician on a wireless device.

For more information about Experion, please refer to:

- EP03-100-210 Experion Process System Overview
- EP03-200-210 Experion Server Specification and Technical Data
- EP-3-300-210 Experion Platform CEE-based Controller Specifications and Technical Data
- EP03-310-210 Experion Application Control Environment
- EP03-400-21 Experion Chassis I/O Modules - Series A Specification and Technical Data
- EP03-410-210 Experion Rail I/O Modules - Series A Specification and Technical Data
- EP03-420-210 Experion Galvanically Isolated/Intrinsically Safe Rail I/O Modules - Series H Specification and Technical Data
- EP03-430-210 Experion PM I/O Specifications and Technical Data
- EP03-440-210 Experion DeviceNet Specification and Technical Data
- EP03-450-210 Experion PROFIBUS DP Specification and Technical Data

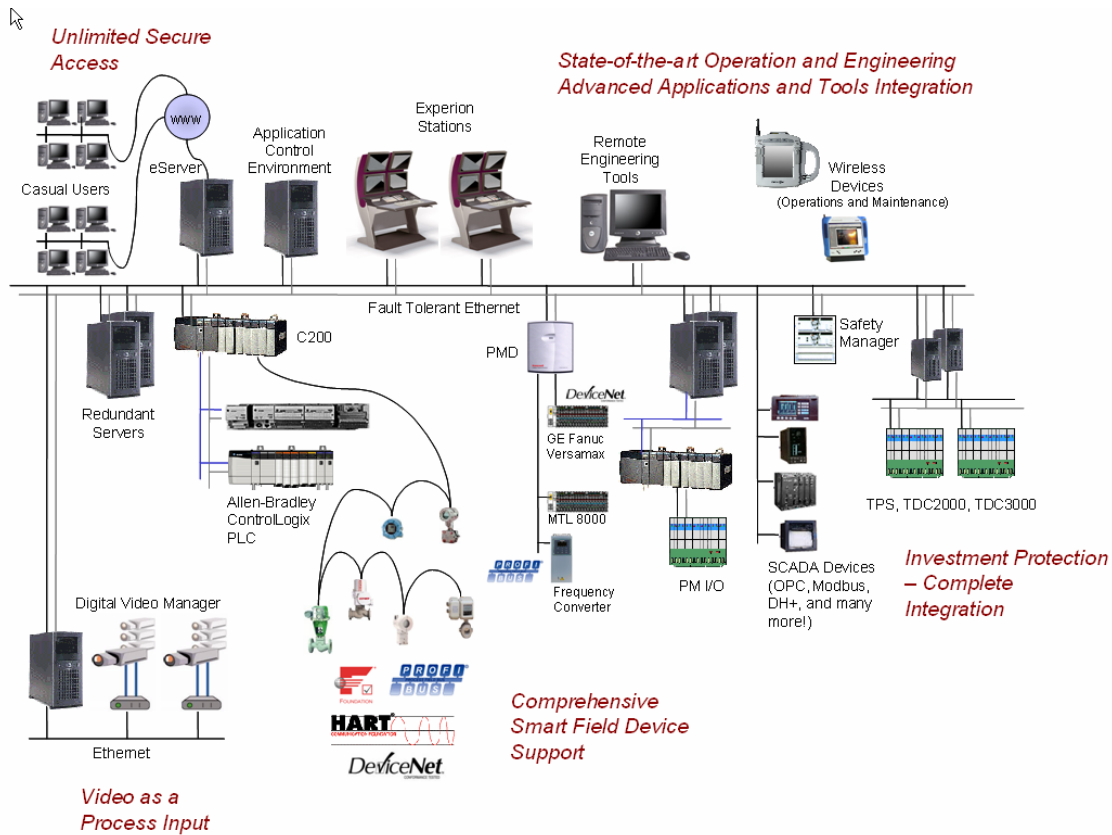


Figure 1. Sample Experion Architecture

Product Description and Features

Experion Station

The Experion Station employs industry-leading technology and advanced features to provide the operations platform required for today's enterprises. Addressing today's needs and tomorrow's requirements is the hallmark of the HMIWeb technology at the heart of the Experion Station.

There are several types of Experion Station available to satisfy a broad range of needs. They include:

- Experion Station – Flex (ES-F)
- Experion Station – Console (ES-C)
- Experion Station – TPS (ES-T)
- Experion Station – Console Extension (ES-CE)

In addition to the Experion Stations cited above, a wireless configuration is also available. Mobile Station PKS is discussed on page 6.

All Experion Station types utilize the same operator interface and share the available feature set for consistent operation regardless of node. This also means that configuration is simplified as custom displays, trend sets, etc. are configured once and available across the various types of Experion Stations.

A mix of Experion Station types can be implemented to provide the most appropriate, site-specific solution possible. For example, a site may choose to implement a mix of ES-Cs and ES-CEs in a central control room. ES-Fs could be used on the plant floor, in satellite control rooms, and in the engineering and maintenance offices. Additionally, casual users throughout the enterprise may use ES-Fs or eServer solutions (see the eServer Product Information Note, PN-04 -009-ENG).

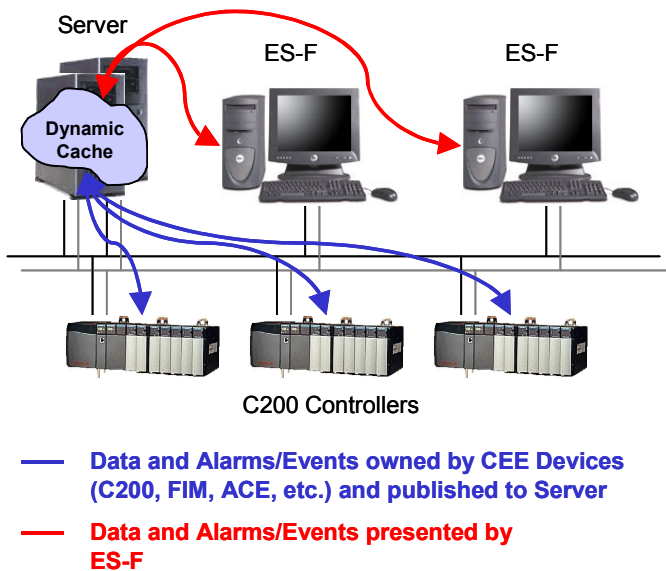


Figure 2. Experion Station – Flex

Experion Station – Flex

The ES-F is a very versatile operator interface. Since it utilizes a client-server relationship to present process data to the operator, it can be applied anywhere as long as it has a connection to the server (or redundant servers), including Internet, wireless and dial-up connections.

When configuring an ES-F, the user has a choice of connection methods:

- **Static** – Provides a permanent, dedicated link to a specific ES-F. This is the recommended connection type when used for fulltime operations.
- **Rotary** – Provides an “as required” connection to an ES-F. This is the recommended connection type for staff who do not need full-time access. Rotary connections are advantageous from a licensing point of view because your license only specifies the number of simultaneously connected ES-Fs (concurrent-use licensing).

Rotary Stations also provide the option of using the Experion Station interface or Microsoft’s Internet Explorer (IE). IE is ideal for staff that wants to use familiar desktop tools to interact with the process. All the

security mechanisms (see page 12) of the Experion Station are employed when using Internet Explorer to protect your process from unauthorized changes.

The performance benefits even reach above and beyond the economic benefits of implementing ES-Fs in an Experion PKS architecture. For instance, the Experion Server subscribes to data and alarms/events on a proxy basis for each ES-F as required. This results in the minimum possible communications to the CEE Devices (C200 controller, ACE, etc.) as shown in Figure 2.

Experion Station – Console

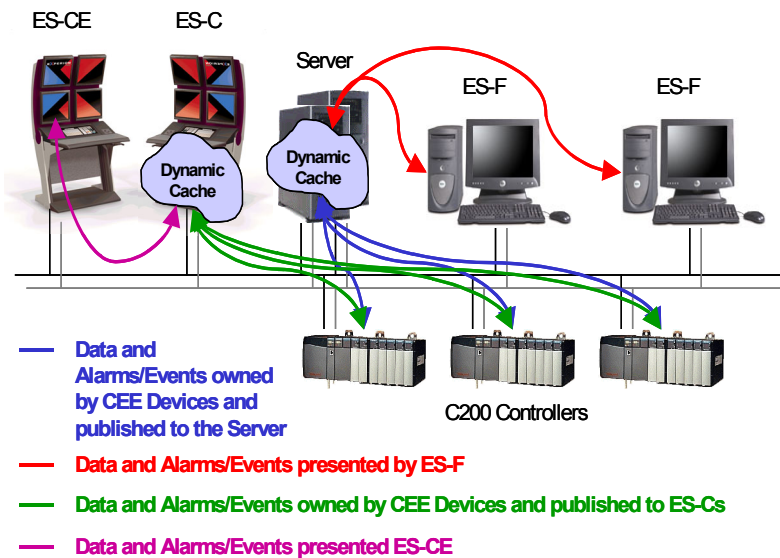
An ES-C provides all the capabilities of an ES-F except that it communicates directly to the Experion CEE subsystem (supports devices such as the C200 controller, ACE, etc). This provides a high-availability operations platform for critical processes. This node is designed specifically for processes that run continuously and require operations personnel to maintain a constant view of that process.

Some key characteristics of the ES-C include:

- Direct connection to data and alarms/events to direct data sources such as C200 controllers, ACE nodes, Foundation Fieldbus Interface Modules, etc. within a cluster Server even when the server is unavailable.
- Fault Tolerant Ethernet (FTE) -based node that requires the subsystems it directly connects with to also be connected with FTE.
- No duplicate database configuration – no extra engineering effort to add an ES-C to a system
- Multi-window functionality (including SafeView®) is standard functionality with each ES-C

Experion Station – TPS

The ES-T encompasses many functions specific to the migration of TPS. As such, its technical data and specifications are included in document EP03-220-210, TPS Integration Specification and Technical Data.



multiple casual users, to secure system access for mobile operators. Solutions run on hardware platforms such as:

- Handheld and similar mobile devices on a wireless network, for example off-the-shelf PDAs, or a variety of rugged, specialized devices.
- Computers that are not on the process control network, for example computers connected to your business network or on remote networks.

Figure 3. Experion Station – Console and Console Extension

Experion Station – Console Extension

The ES-CE operates like a Flex Station except that it connects directly to an ES-C instead of the Experion Server. The ES-CE, shown in Figure 3, provides an economical and efficient way to extend the high-availability functionality of the ES-C.

ES-CE's and ES-C's can be grouped together as part of logical consoles as described later in this section. Multi-window functionality (including SafeView) is standard functionality with each ES-CE.

Console Functions

A combination of ES-C's and ES-CE's connected to a cluster server can be grouped together to form a single workspace for an operator. A logical console can be used as a single operator interface for event handling, alarm acknowledgement, alarm silencing, display manipulation and other functions.

Mobile Station

Mobile Station comprises a powerful family of solutions for relaying control system information to remote users where and when needed. Each solution is optimized for specific customer applications, ranging from read-only access over the Intranet by

Mobile Station consists of three different solutions (two require eServer – see page 20) to meet the many different options for delivering information to the field:

- **Mobile Access for eServer Standard** is a zero footprint solution that makes use of Honeywell's eServer to deliver secure view-only, casual access to Experion process graphics from any standard Web browser.
- **Mobile Access for eServer Premium** provides a secure view-only, dynamic browser connection that displays live updating Experion graphics.
- **Mobile Access for Station** provides remote access to full Station capabilities as well as remote access to Configuration Studio. Users have the same level of control of the plant from their remote device as they would from a control room. A description of Configuration Studio is included in document EP03-200-210, Experion Server Specification and technical Data.

Both Mobile Access for eServer Premium and Mobile Access for Station use a Remote Engineering and Station Server that runs Terminal Services.

Common Experion Station Features

The Experion Human Machine Interface (HMI) utilizes Honeywell's HMIWeb technology, a Web-based architecture that allows HMIs, application data, and business data to be integrated. HMIWeb utilizes Honeywell's next-generation operator interface technology, which uses HTML as the native display format to provide access to process graphic displays from either the secure Experion Station environment or directly from Microsoft's Internet Explorer, without functionality-reducing exports or cumbersome plug-ins. The use of an open, industry standard file format reduces engineering time while allowing users to take advantage of existing knowledge and reuse displays between systems. Full support for displays from earlier PlantScape release file formats ensures direct migration path for existing PlantScape release systems. These benefits are all achieved while maintaining secure access, robust design, and high performance.

The Experion Station HMI allows for state of the art, object based graphics to provide a powerful interface for the user. The use of industry standards, such as Microsoft Windows 2000 and XP, Ethernet, HTML and the Internet, minimize operator training by providing a familiar operating environment at all times.

The HMIWeb Station makes extensive use of user configurable pull-down menus and toolbars to allow easy, intuitive navigation and fast access to key process data. The usability of the operator interface is further enhanced with features such as recently used command list, copy and paste, live video integration, ActiveX support, scripting, launching applications and support for standard peripherals such as:

- Sound cards,
- Touch screens,
- Multi-screen video cards, and
- Trackballs.

Critical information is conveyed using dedicated annunciators for alarms, system events and operator/controller messages. A dedicated alarm line at the bottom of each graphic shows the most recent (or oldest)

highest priority, unacknowledged alarm at all times.

The Experion Station can be customized to provide the appropriate operating environment for an operator, site or company. This includes the ability to add and modify toolbars, menus and keyboard shortcuts of the Experion Station.

Standard System Displays

Standard system displays make it easy for operators to learn and use the system. An extensive range of standard displays is available including:

- Menu/navigation displays
- Alarm summary
- Event summary
- Trends
- Operating groups
- Point details
- Popup faceplates
- System status displays
- Configuration displays
- Loop Tuning displays
- Diagnostic and maintenance displays
- Summary displays

OPC Display Data Client

The OPC Display Data Client is standard functionality in Experion that allows the user to insert OPC Data into a display without the need to build points. The user is not required to purchase points for OPC Data of this type. This is ideal for data that just needs to be visualized by the operator and does not need to be alarmed, historized, etc. OPC Data that is acquired in this fashion supports both reads and writes.

Popup Faceplates

Integrated popup faceplate windows support is standard in the Experion Station. Faceplates are launched with a single click from your process graphic display. No engineering is required.

All standard point types are delivered complete with faceplates, and if required, the user can build their own custom faceplates. The faceplates provide advanced features including:

- Up to 4 faceplates can be opened at once.
- Faceplates operate in round-robin scheme, unless a specific faceplate is push-pinned.
- Push-pinning preserves the faceplate from closure when new display pages are called. As a result, the user can call a trend display, view an alarm display and then return to a process display while maintaining process control from the faceplates.

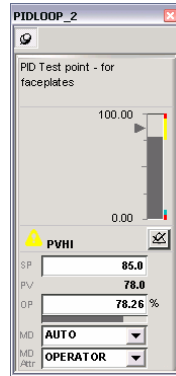


Figure 4. Standard Faceplate

Shortcut Menus

Shortcut menus are often referred to as "right-click" menus because they appear when the operator right-clicks on a dynamic object in a display. Shortcut menus enable direct access to actions that apply to the selected dynamic object. Each dynamic object in a display can be configured to use a standard or customized shortcut menu.

SafeBrowse

SafeBrowse allows the user to securely browse either their company Intranet or Internet right from within Station. This allows operators and engineers to view corporate documents, such as Standard Operating Procedures and product Information from across the world. Because the operator is using Station as the browsing interface, the view on alarms is maintained.

SafeBrowse offers three levels of security to restrict access:

- Unrestricted
- Restricted (limited to certain URLs)
- No Access

Alarm and Event Summary Displays

Alarm Summary

Designed to conform to the ASM Consortium's recommended guidelines, the standard Alarm Summary display allows operators to focus on the problem at hand. The following features provide a powerful and flexible environment:

- Selectable Location Pane representing the Asset Model and Alarm Groups. Supports rapid alarm filtering and provides summary alarm count details.

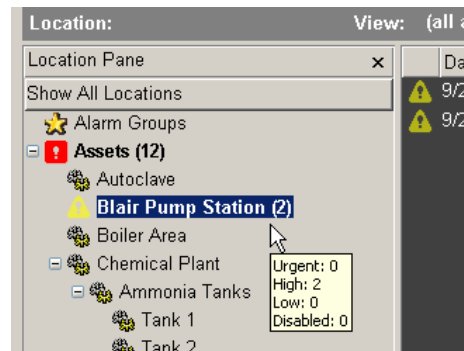


Figure 5. Alarm Summary Location Pane

- Selectable Detail Pane shows extensive alarm condition details.
- Alarm summary columns can be customized to suit individual site or operator requirements. Fields can include the actual trip value and current live value among many other fields.
- View Configuration creates, saves, and recalls custom operator alarm views (Asset / Time / Point filters).
- Custom Filtering can be applied to each column in the alarm display, enabling rapid attention to be focussed on problems.
- Alarms can be filtered by Priority.
- Repeat Alarm Handling keeps the Alarm Summary from filling up with a chattering alarm. A single alarm includes details on the time the alarm originally occurred, the time it last occurred, and the total number of times the alarm occurred.

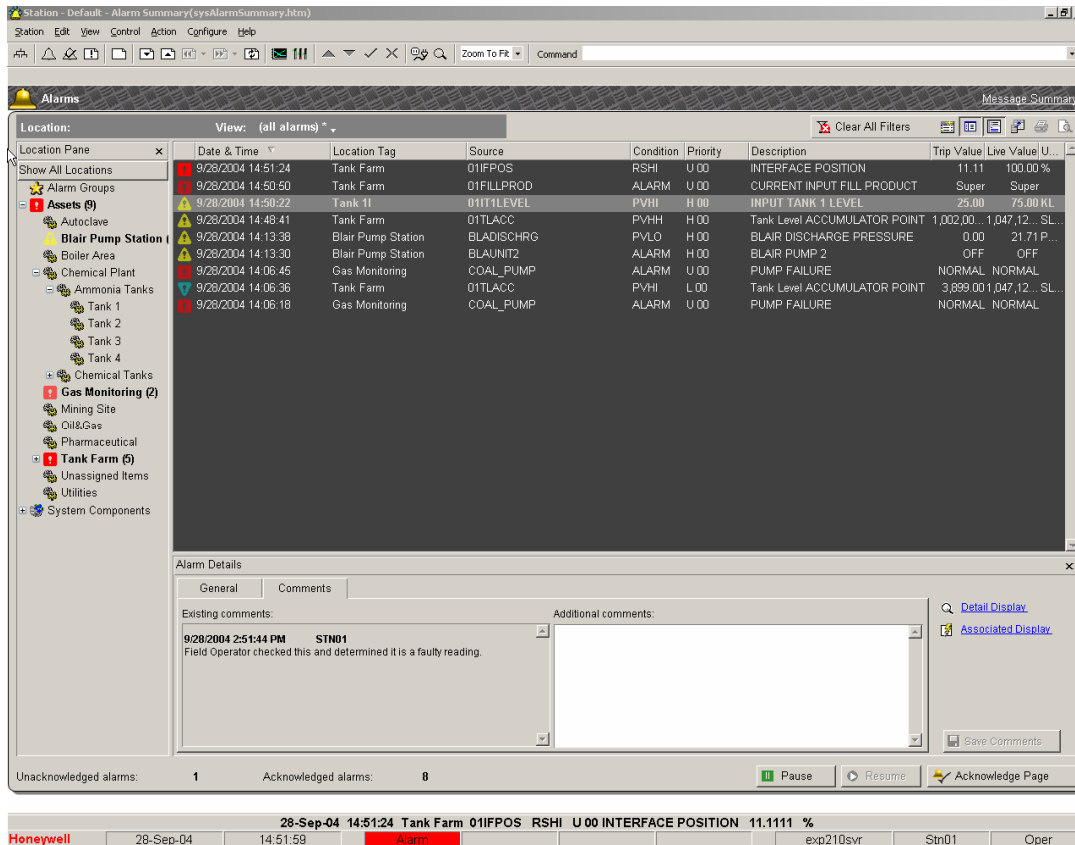


Figure 6. Alarm Summary with Pane and Detail Pane

Alarms on the Alarm Summary display can be acknowledged either individually or per page. On custom graphics, alarms can similarly be acknowledged on an individual or per page basis.

Experion allows the engineer to configure custom alarm priority colors. The custom colors configured for the various alarm priorities can also appear on all process graphic displays. This enables operators to immediately determine which alarm conditions are most important. In addition to this feature, the alarm annunciator in the Station status zone blinks with the color of the highest priority unacknowledged alarm – another time saving feature for plant personnel.

Event Summary

The Event Summary lists events that occur in the system, including:

- Alarms
- Alarm Acknowledgments
- Return to Normal
- Operator Control Actions

- Operator Login & Security Level Changes
- On-line Database Modifications
- Communications Alarms
- System Restart Messages

Users can configure archive functionality to store events online as well as to network servers or removable media to access at a later date.

System Alarm Summary

The System Alarm Summary enables quick navigation to the consolidated overview of all Experion System alarms. All nodes are displayed in a tree view, with alarms represented against each node.

Sequence of Events Summary

A Summary Display is also available to present SOE (Sequence of Events) notifications to the operator. Note that SOE notifications are only available when specific SOE-capable hardware is implemented.

The features of this display are essentially identical to the Event Summary Display.

Common Summary Features

The default summary displays provide a scrollable list of all alarms, events and messages. This can often be a large amount of information for an operator to view at one time.

Customizing the summaries enables the operator to organize the information to provide more useful summaries for any situation. For example, an operator can customize the Alarm Summary to show only the urgent priority alarms within a particular location.

Customization of the summaries can be protected. For example the view configuration function can be disabled for certain operators.

The summary displays also include an ad-hoc reporting capability. The operator can choose to view or print in report format the summary display as configured with custom sort and filter conditions.

The detail pane for summaries includes tabbed displays. A general tab includes all information about a selected entry. A comment tab allows operators to enter comments about this particular entry, and operators can enter multiple comments without overwriting the original comments. Each entered comment is also saved as an event.

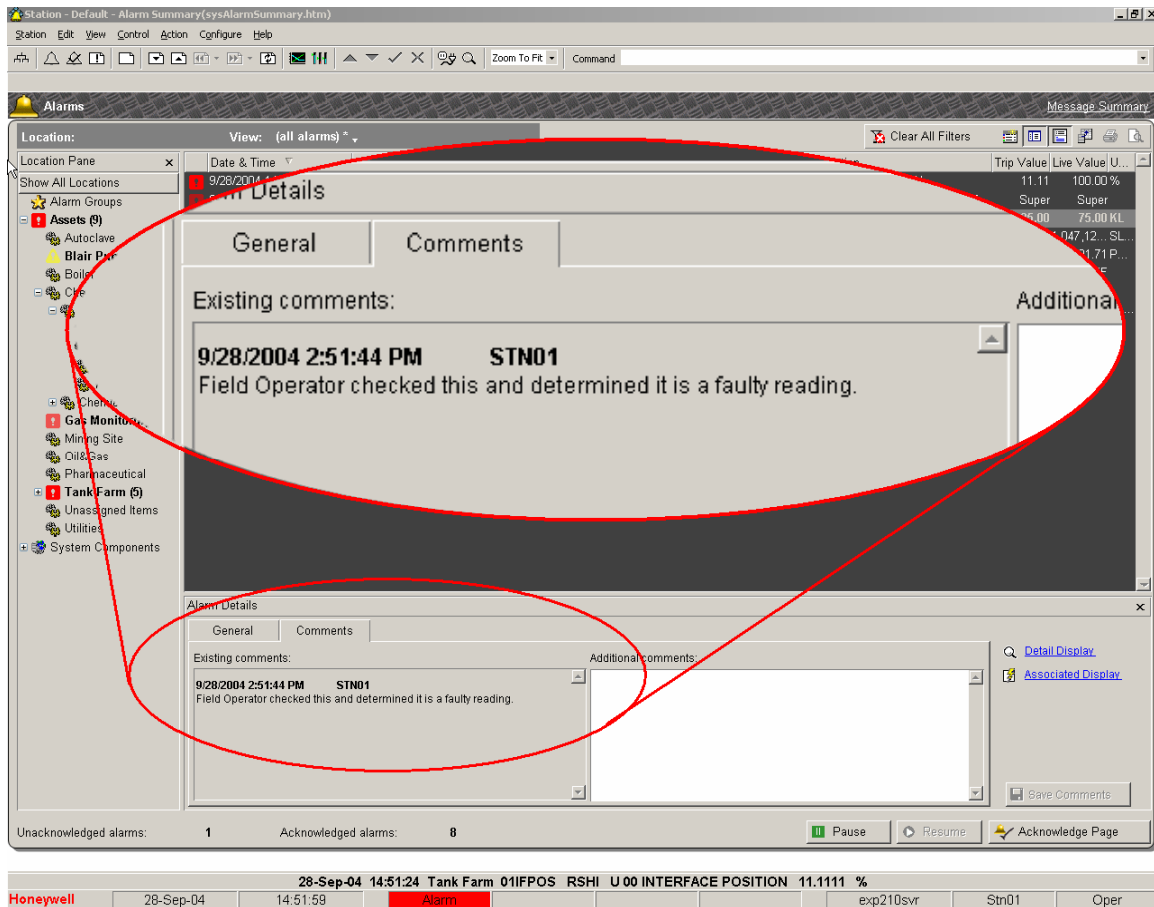


Figure 7. Comment Tab of Detail Pane

Trending

The flexible trend capabilities in Experion allow trends to be pre-configured or configured on line as necessary by simply selecting the point and the parameter from the database. Any of the history collection intervals may be used as the basis. Standard trend types include:

- Single bar graphs
- Dual bar graphs
- Triple bar graphs
- Multi-plot trends
- Multi-range trends
- X-Y scatter plots,
- Numeric tables
- S9000, Micromax and UMC800 Set Point Program plots
- Group trends

Functions providing data analysis include:

- Combination real-time/historical trending
- Trend zooming, panning, and scrolling
- Hairline readout
- Declutter
- Configurable trend density
- Simple recall of archived history
- Trend protection
- Smart clipboard support for copy/paste of data

The declutter feature, for example, enables individual traces on multi-type trends to be temporarily disabled for clearer viewing without requiring reconfiguration of the trace. Trends may be easily configured on line through standard trend displays, without the need to build displays. Real-time and historical data are presented together on the same trend. Archived history may be accessed automatically by simply scrolling to, or directly entering, the appropriate time and date.

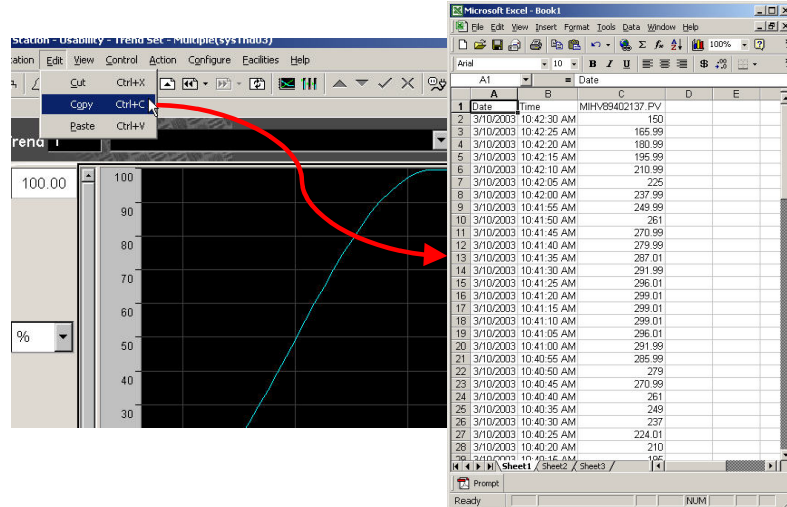


Figure 8. Simple Copy/Paste of Trend Data

Group Displays

Standard Group Displays are provided to allow configuration of panel board-like displays. By grouping related points into a Group Display, operators can more easily interpret process activity.

Each group contains up to eight points, and each point has its own faceplate that displays the values of the major parameters.

Group faceplates are consistent in design, functionality, and appearance with the standard Popup Faceplates and Detail Displays. Each Group has three standard views available including faceplate, group trend (with control parameters accessible), and numeric trend.

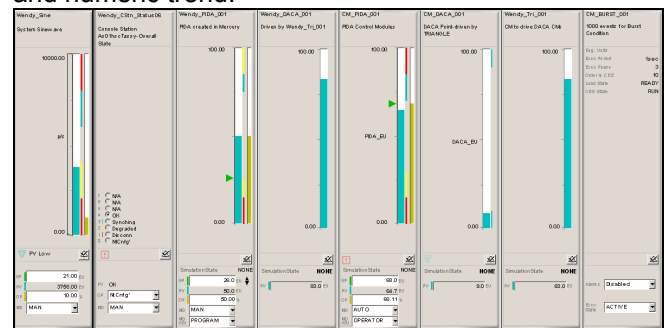


Figure 9. Sample Group display

Reporting

Experion provides many built-in reporting functions. Standard report descriptions include:

- Alarm/Event Log – reports all alarms and events in a specified time period. By using filters, this report provides an operator and/or point trace facility.
- Alarm Duration Log – reports the time of occurrence and elapsed time before return-to-normal for specific alarms in a specified time period.
- Alarm and Event reporting across nominated servers in a Distributed System Architecture.
- Integrated Excel Report – provides the ability to launch a report built using Microsoft Excel in a similar way to all other standard reports. Microsoft Excel can access the Experion database using the Open Data Access option (see EP03-200-210, Experion Server Specification & Technical Data).
- Free Format Report Writer – generates reports in flexible formats, which may include math and statistical functions such as Max/Min and standard deviation.
- Point Attribute Log – reports on points displaying specific attributes, such as off-scan, bad data, and alarm inhibit.
- Point Cross-Reference – determines database references for specified points to enable easier system maintenance when points are decommissioned or renamed.
- When specific SOE-capable hardware is implemented SOE reporting includes filtering and time sequenced sorting by IOLINK
- Batch Reporting – enables integrated reporting of Batches or Lots of a production process run, to be compiled and archived automatically. This feature enables batch history and events to be output either as a CSV file or directly into Microsoft Excel, if available. The Batch Report option is designed as a simple discontinuous batch or lot reporting option. For a complete Batch solution with Experion, please refer to TotalPlant Batch (TPB), which is completely integrated with Experion providing advanced batch control and advanced reporting tools.

Reports may be generated periodically, or on an event-driven or demand basis and may be configured on line. Report output may be directed to screen, printer, file, or directly to another computer for analysis or viewing electronically.

Security

System security enables you to control who has access to the system and to control what users can do within the system when access is granted. Experion provides two types of Station security:

- Station based security
- Operator based security

Station based security

Station based security provides 6 different security levels ranging from view-only to manager mode. When a station is configured to use station-based security the user is prompted to enter a password when the user requests a higher level of access.

Security levels can be assigned to server functions. For example, a push button on a display might be assigned a security level of supervisor when a custom display is built. In order for an operator to use the push button, the Station security level must be either supervisor or higher.

Operator Based security

Operator-based security is used to assign a specific security level to each user. Users cannot access any Station unless they enter a valid ID and password. To access a higher security level than the one they are currently using, users need to sign on again as a different operator who has the higher security level.

Operator based security offers a variety of security strategies:

- The **traditional operator account** is defined in the Experion Server. Authentication (verifying that a user is known to the system) and authorization (control what the user can do within the system and what assets the user can access) are both done by the Experion Server.
- The **integrated account** combines a Windows user account or Windows

group account and an Experion operator account. Authentication is done by Windows while authorization is done by the Experion Server. Using integrated accounts enables you to:

- Use existing enterprise-wide security policies
- Use single signon
- Use Windows auditing to track user activities

Up to six security levels govern security access to Experion functions:

Security Level	Functionality
View Only	View-only mode.
Acknowledge Only	View only mode with alarm acknowledgment capability.
OPER	Operator mode.
SUPV	Operator mode plus the ability to configure standard system infrastructure such as reports, history assignment etc.
ENGR	Supervisor mode plus the ability to configure more settings etc.
MNGR	Unlimited access.

Operator-based security provides up to 255 control levels to further refine operator control access to individual items of plant and equipment.

Assignable assets limit Operator or Station access to graphics, alarms and point data to assigned locations, providing effective plant partitioning. The limitation of location assignment can be further refined to define access as view only, acknowledge only, or full control. Locations can also be enabled or disabled for control between certain time and date criteria. For more information on assignable assets please refer to the profile section on the next page.

As a configuration option, the system will require that both the Operator and Station have appropriate assignable asset access prior to granting control. This enhances safety by preventing an Operator with broad access from operating equipment from an unsafe location.

Any actions initiated by an operator are logged in the Event database against an

operator identifier. In addition any control action to a given point is only allowed if the control level configured in the operator profile exceeds the level assigned to the point.

Experion High Security Policy

The High Security Policy leverages the Microsoft Windows group policy security model to enable you to control how programs, network resources, and the operating system behave for users and computers in the organization. The High Security Policy can be implemented in both the workgroup and domain environment. In the domain environment security settings are implemented at the group level, and automatically apply to all member of that group.

Single Signon

Single signon enables operators to log on to the Station computer and start Station by providing their operator ID and password only once when they log on to the computer. This is a configurable option that requires the use of operator-based security integrated with Windows 2000 accounts.

Signon Manager

Signon Manager is a standard application that provides a point of single signon on a particular computer to applications that use this facility. Users can:

- Sign on to any applications that are "Signon aware" through Signon Manager.
- Change the current user without having to shut down and restart any applications or the computer.
- Temporarily override the current user security credentials without having to shut down and restart any applications or the computer.

Signon Manager is optional and can be used with Station if the security type is operator-based and integrated with Windows 2000 accounts.

When a different user signs on to Signon Manager, any instances of Station that are running receive notification of the change of

user. The Experion server then verifies the authority of the user in the normal manner and changes to the appropriate security level for the current signed on user.

For example, an operator is logged on to Signon Manager and is running multiple Stations. At the end of the shift, the next operator needs to sign on with their security credentials. The operator for the next shift calls up Signon Manager and enters their user name and password. All instances of Station are notified of the change of operator and the new operator is now effectively logged on to all Stations with the correct security credentials.

Profiles

A profile consists of a list of assets and an asset time period. When operator-based security is used, profiles provide:

- Additional security, through the ability to assign assets only for specified times and dates.
- A method of giving an operator additional access at specified times. For example, after hours monitoring from a central location.
- A quick way of assigning assets to operators.

When defining the asset list, each asset can be refined to include view only, acknowledge only, or full control capability.

Associated Stations

Experion Station can be configured so that the current display is “sent” for display to one of two other Experion Stations when a particular keyboard shortcut is used at the original Experion Station. The Experion Station to which the display is sent is known as an “Associated Station.” This provides a simple mechanism for an operator to view displays on many Experion Stations while controlling from a single Experion Station. Additionally, scripts and other display mechanisms can use the Associated Station functionality to automatically call up displays of interest.

Station Scripting Objects

Sophisticated Experion Station customization can be implemented by creating Station Scripts that can be run on an Experion Station. For example, you might want to configure Experion Station so that a specific display is shown on operator changeover.

HMIWeb Display Builder

HMIWeb Display Builder, accessed via Configuration Studio, is used to create custom process displays used to control a plant, mill, process, etc.

HMIWeb Display Builder is an object-based, fully integrated custom display builder for development of application specific graphics. Animation of displays is completed quickly and easily with simple point and click type configuration.

Standard Tools

HMIWeb Display Builder is equipped with a wide range of standard functions for building and modifying displays. Powerful object manipulation and transformation functions allow display developers to arrange and manipulate objects as necessary.

Transformation functions extend the ability to create objects appropriate for each plant or mill. These include the ability to perform Union, Difference, Intersection, Exclusive Or, and Join (used to create a “closed” object from multiple “open” objects) functions on groups of objects to create complex display objects.

The figure below illustrates these concepts further. Final transformation functions include Combine and Uncombine. Combine is used to improve the performance of an extremely complex display by combining static vector graphic objects — this converts them into a single metafile, which is easier to render.

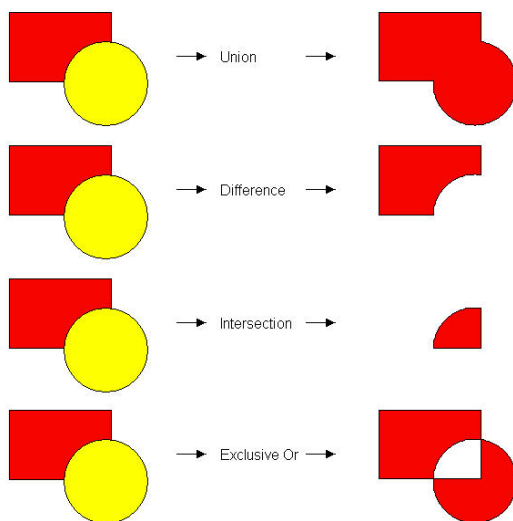


Figure 10. Transformation Functions

Uncombine reverses this function.

The standard node editor further extends the flexibility in creating display objects.

HMIWeb Display Builder also provides

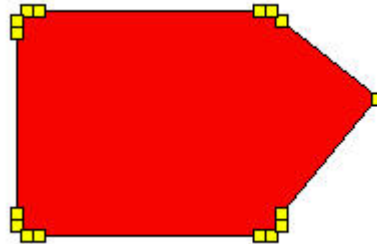


Figure 11. Modifying a Rounded Rectangle with the Node Editor

standard tools for manipulating items such as text, color, and lines. These tools adhere to defacto Microsoft standards to make the display developer as effective as possible.

Data-bound Objects

Standard objects are supplied to allow easy links to real-time data in the Experion database. Objects include alphanumeric, checkboxes, pushbuttons, indicators, combo-boxes, charts, alarm tables, and event tables. Each object can be configured to use the default station update, a custom update rate or a “one shot” update during page callup.

ActiveX

In addition to standard data bound objects, the user can enhance the capabilities of a display by inserting objects such as ActiveX documents and ActiveX controls.

Graphics

Inserting digitized photographs, schematic drawings and other suitable graphics can significantly enhance your displays.

The following types of graphics can be inserted and manipulated:

- Windows Bitmap (*.bmp)
- JPEG Image (*.jpg)
- Metafile (*.wmf)
- Enhanced Metafile (*.emf)
- Portable Network Graphic (*.png)
- CompuServe GIF (*.gif)

Script

Although the majority of animation requirements are met with native functions provided by the HMIWeb Display Builder, display scripts can also be employed as necessary. HMIWeb displays are DHTML (Dynamic HTML) pages that are based on the Web-standard Document Object Model (DOM). Therefore, display scripts are very similar to scripts used in standard Web pages.

Scripts can be written in either VBScript or Jscript. This is a configurable selection per display. The script editor supports the Intellisense feature that displays information in lists and popups as you write your code.

Scripts are *event-driven*, which means that a script only runs when the associated event occurs.

Displays support *event bubbling*, which means that an event passes up the object hierarchy until it reaches an object that has a script for that event. For example, if a user clicks an object that is part of a group, the event can bubble up from the object, to the group and finally to the page.

Event bubbling allows the user to write page-level scripts that handle a particular event for all objects – this technique makes it easier to maintain and debug scripts. For example, rather than writing a separate onclick script for each object, simply write one onclick script for the page. Such a script would check which object generated

the event and then perform the appropriate task. Note that properties can be set to turn event bubbling off, if necessary.

Improved error handling for scripts on displays includes user-defined error-handling functions.

Cascading Style Sheets

Displays can be configured to reference an external style sheet file that governs all aspects of a display, from color and line thickness to dynamic aspects. Each element on a graphic can be given a CSS class. Using CSS allows users to easily make wholesale changes to many graphics.

Shape Gallery

The Shape Gallery makes it easy to insert shape sequences and dynamic shapes (see page 17) into displays. Additionally, a preview tool is provided with the Gallery to help the user by previewing the shape's animation. Standard tools are provided to replace shapes across multiple displays;

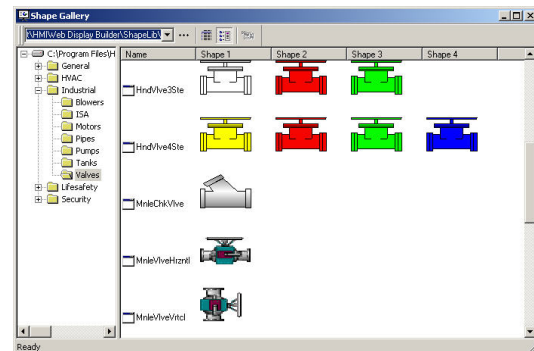


Figure 13. Shape Gallery Tool

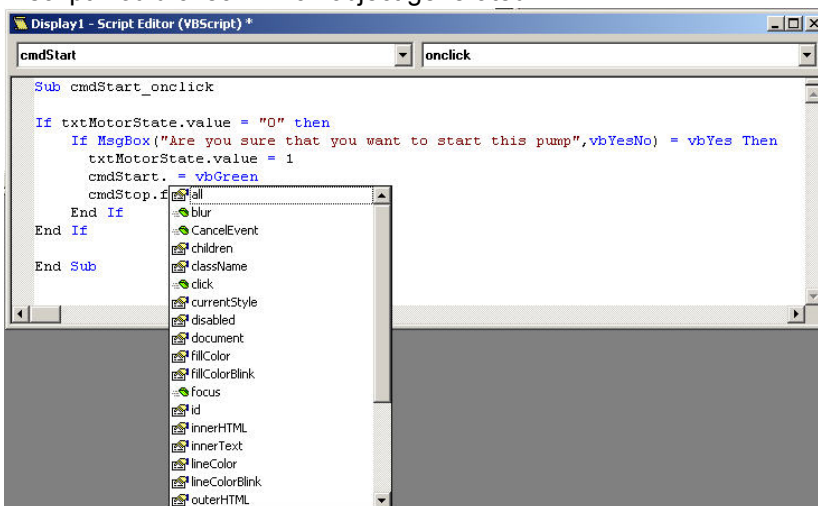


Figure 12. HMIWeb Display Builder Script Editor with Sample Display Script Written with the Aid of Intellisense

Productivity Tools

HMIWeb Display Builder provides several standard productivity tools to allow the display developer to be as effective as possible.

The Rename Point tool allows the user to easily change a Point ID reference used in multiple places throughout a display. This time saving tool prevents the user from searching for and changing each link to a Point ID.

HMIWeb Display Builder includes a Display Performance Analysis tool. This tool analyzes the objects included in the display to provide guidance to the user on where to improve the construction of the display.

Display Builder Assistant allows a display developer to perform operations on collections of displays files. These operations include the ability to rename points for a set of files; upgrade shapes in a set of files; and archive (and un-archive) a set of display files. An archive encapsulates the display and all its associated files (bitmaps, data definitions, etc.) into a single text-based file. The text file is easily integrated with source control systems, more easily transmitted via e-mail, etc.

The replace shapes tool can perform a replacement of shapes of one file name with a shape of another file name in a display. The user has the choice to retain the size of the original shape or to use the size of the new shape. Additionally, the Display Builder Assistant exposes this same functionality in a bulk replacement fashion to replace shapes in an entire subdirectory of displays.

Display Types

Shape Sequence

A shape sequence is used in displays as either a status indicator or an animation. When used as a status indicator, the shape that corresponds to a status points state is displayed (see Figure 18). Note that this could be accomplished with script, but this standard feature saves the user from developing, testing, and maintaining the script over the life of the display(s).

Shape Sequence with two shapes

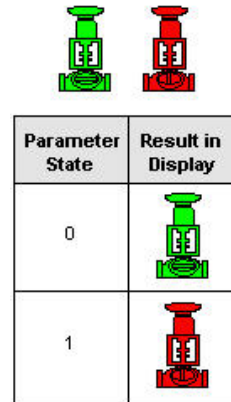


Figure 14. Sample Valve Shape Sequence

When a shape sequence is inserted into a display, it can be either embedded (paste) or linked (in which case, the shape sequence remains in a separate file). When linked, the display will automatically pick up a change if the shape file is modified. Embedded shapes do not automatically pick up the change to a shape file. However, there are tools provided to upgrade embedded shapes for a display or set of displays. Embedded shapes have the advantage of allowing better overall performance for the display when large numbers of shapes are required. Linked shapes are ideal during initial configuration as the shape may be modified. Once the displays are finalized, the HMIWeb Display Builder can convert linked shapes to embedded shapes to provide additional display performance.

Dynamic Shape

A Dynamic Shape is an object used to represent complex dynamic data. The shape can include dynamic objects and script as necessary. Like a shape sequence, it can be embedded in or linked to the display. Dynamic shapes are typically used when the process equipment it represents is symbolized many times throughout one or more displays. This provides efficiency to the display building process, as the user only has to identify in a standard dialog box the specific Point Ids for each object when inserted.

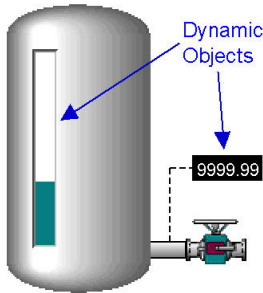


Figure 15. Sample Dynamic Shape with Two Dynamic Objects

Popup

A popup is a secondary window that appears when a user clicks the object to which it is attached. As described on page 7, faceplates are a specialized type of popup that shows critical information about the point to which the object is linked. These are created using the popup display type. Popups and faceplates are created using all the standard tools of the HMIWeb Display

Builder as described above. They can be attached to any object on the display.

Note that the created popup is a true window and is not confined to operation within a parent window.

Template Displays

A template display is a custom display that is used to represent a unit of equipment containing several points of one or more fixed types. This allows the display designer to build and maintain one display rather than a set of displays where appropriate.

To use a template display, you first define a container point for the unit of equipment. The container point operates as a custom point type for a unit of equipment, such as a compressor, that contains several points of one or more fixed types. For example, you might have a number of compressors that all contain:

- An analog point to monitor the pressure
- A status point to control the motor
- An accumulator point to monitor hours run

“Compressor” container points tie these sets of points together so that each set can be managed as a single point.

Display Documentation

HMIWeb Display Builder includes standard report functions to document display contents in HTML or XML report formats.

Options

Electronic Signatures

The Electronic Signatures option is specifically designed to support users that must meet the requirements of 21 CFR Part 11 such as the Pharmaceutical industry. However, it is also useful to any user requiring the ability to absolutely trace all operator actions. The electronic signature option allows for operator actions, such as acknowledging a message or controlling a point, to require one or more electronic signatures to complete the action.

Electronic Signatures requires the use of operator-based security integrated with Windows 2000 accounts.

An action can be configured to require single or double signatures as well as a reason for the action. A set of reasons must be configured so that the operator can select from this set at the time of signing. A reason set can contain up to 32 reasons.

Events recording the names of the operators responsible for the action, date, time and reasons are generated and stored in the events database (see document EP03-200-210, Server Specifications and Technical Data). These events can be viewed in the Event Summary. If an operator partially completes signing an action and then cancels the action, an event is also generated.

Operator actions are not complete if:

- The user name or password provided by the operator is invalid.
- The operator cancels the Electronic Signature dialog box.
- A timeout has been set for the action and the time has been exceeded before the signing was complete.

The screenshot shows a dialog box titled "Electronic Signature" with a close button (X) in the top right corner. The main content area is titled "Add 20L of Chemical X". It features two tabs: "Primary signature" (selected) and "Secondary signature". Below the tabs, the following information is displayed: "Minimum control level: 127" and "Requires access to area: PlantSys52". There are several input fields: "User name:" with the value "sgray", "Full name:" with "Susan Gray", "Password:" with masked characters "*****", "Domain:" with a dropdown menu showing "PLANTDOMAIN1", and "Meaning:" with "Responsibility". A "Comment:" field contains the text "Chemical X looked more diluted than normal." and has a small dropdown arrow on its right. A "Sign" button is located to the right of the comment field. Below the input fields is a "Legal text:" section with a scrollable text area containing the following text: "Pursuant to Section 11.100 of Title 21 of the Code of Federal Regulations, this is to certify that [name of organization] intends that all electronic signatures executed by our employees, agents, or representatives, located anywhere in the world, are the legally binding equivalent of traditional handwritten signatures." At the bottom of the dialog are "OK" and "Cancel" buttons. A status bar at the very bottom indicates "Primary signature required" and "Secondary signature required".

Figure 16. Sample Electronic Signature for a Message Acknowledgement

- The operator does not have the appropriate security level required for the action.

The legal text displayed in the Electronic Signatures dialog box can be customized to meet site requirements. The legal text informs the operator that their electronic signature is the legally binding equivalent of their handwritten signature.

Specialized Keyboards

Honeywell offers two specialized keyboards for use with Experion Station. They are the Integrated Operator Keyboard (IKB) and the Operator Entry Panel keyboard (OEP).

Both keyboards include a set of shortcut keys with predefined actions assigned. In addition, both also have a set of keys to which you can assign actions, and LEDs that can be controlled. For example, a key can be set up so that the LED on that particular key is red, fast blinking when a point goes into alarm. When the operator presses the key, the associated display is called up for the point in alarm.

Other IKB/OEP functionality includes amongst others:

- a SIL key to enable an annunciator silence
- an ACK key to enable an alarm acknowledgement as well as silencing of the annunciator
- a SYS STATS key to call up the system alarm summary
- User-defined LEDs to be assigned to Alarm groups

The ACK key optionally enables acknowledgement of a page of alarms instead of a single alarm.

Icon Series Console

The Honeywell Icon Series Console provides the capability to use specialized console furniture, an operator keyboard, Swappable Modules and multiple flat panel displays with a single computer. This ergonomically designed operator console supports multiple instances of Experion Station from one computer, viewed on separate monitors, using one keyboard to control each instance.

The Icon Console features individual tilt/swivel flat panel displays, an enlarged work-surface with adjustable height and customized electronic modules for user input and data storage.

Multiple Window Option

This option is ideal for Experion Stations that require multiple monitors, such as the Icon Console. Managed by SafeView, the multiple windows option allows the operator

to work in a windowed environment yet maintain a predictable, repeatable, safe interface to the plant. Users can configure each screen into regions, and designate what type of display or application goes into each region. They can also decide if displays in each region are movable and sizable. Further, users can configure window to not be overwritten or “always on top”, which ensures a constant view of the process.

For Flex Station Multiple windows can optionally be used to run up to 4 instances of HMIWeb Station on a single computer using a single connection license.

eServer

eServer provides the unique capability of enabling and managing Web-based secure, casual access to the process graphics. Based on the Distributed Systems Architecture, eServer brings many benefits to the user:

- Isolation of casual users from the process control system
- Access for unlimited number of casual users using the Standard Access connection
- Minimal engineering requirements

Two classes of user connection are available with eServer, the first is Standard Access (included with the eServer base package) and the second is Premium Access (option available with eServer), providing live updating data. Both user interfaces provide direct browser access to process graphics while ensuring your plant security is maintained.

For full details about eServer, please refer to document PN-04-009-ENG, eServer Product Information Note.

Digital Video Manager

Honeywell Digital Video Manager (DVM) is a complete solution that integrates digital video controls and storage with Experion to deliver unmatched flexibility in process monitoring. It is a revolutionary approach to integrated video allowing video inputs to be treated as just another process sensor.

Using DVM the Experion Station not only allows the operator to view live video from local and remote locations but also provides the ability to switch cameras, and pan, tilt or zoom the camera to focus in on a particular location. The integrated video can be displayed from any video source.

Some of the features include:

- Remote monitoring of unmanned locations.
- Alarm or event-based capture and storage of video images.
- Pre-record capability to capture video prior to initiation of the recording (without the need for continuous background recording).
- Event-activated, user-activated, scheduled and video motion detection activated recordings.
- Ability to search for stored video based on date, time, camera name and Experion alarm or event.

Typical usage scenarios for DVM include:

- Integration of existing CCTV infrastructure in control rooms
- View product quality or attribute (i.e. Smoke Stack monitoring)
- Incident diagnosis
- Integrated security and restricted location monitoring

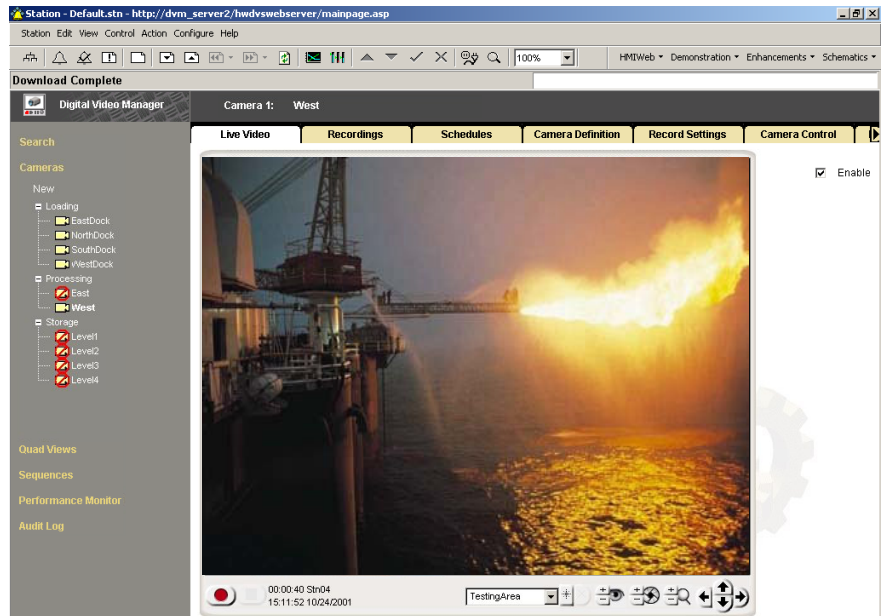


Figure 17. DVM video is viewed directly from Experion Station

Specifications and Sizing

Station PC Requirements

A PC must meet the following specifications to be used as an Experion Station. These guidelines are intended to provide a minimum baseline. Honeywell-supplied platforms will meet these specifications but may not necessarily be the example platforms listed below. PCs purchased directly through Honeywell carry full support as a qualified offering.

The table below lists suggestions per system size configuration.

Minimum System

This is the minimum hardware necessary to run the Experion components. It should be used for small configurations that may consist of 1 non-redundant Experion Server with 1 Station or 1 Redundant Experion Server pair with 1 Station. The system typically only includes passive monitoring and occasional report generation.

Standard System

Configurations will consist of non-redundant Experion Server and multiple Stations or a Redundant Experion Server pair with up to 1 DSA Server. A non-redundant Server can support up to 10-12 Stations or a Redundant Server can support 6-8 Stations. This type of system includes 1 or 2 Stations actively monitoring and occasional report generation.

Performance System

An advanced configuration may consist of a Redundant Experion Server pair, multiple DSA Servers, and greater than 12 Stations. This system typically includes active monitoring from multiple Stations and random report generation.

Flex Station/Console Extension Station Requirements			
System Configuration	Minimum	Typical	Performance
Processor	2.4 GHz Pentium IV or faster	3 GHz Pentium IV or faster	3.2 GHz Pentium IV or faster
RAM ¹	512 MB	512 MB	1 GB
Networking ²	100 Mbps Ethernet	100 Mbps Ethernet	100 Mbps Ethernet
Video Resolution The standard resolution supported is 1280 x 1024	1024 x 768 or 1280 x 1024 65K colors	1024 x 768 or 1280 x 1024 65K colors	1024 x 768 or 1280 x 1024 65K colors
Video Memory (VRAM) per channel	32 MB	32 MB	64 MB
Hard Drive	20 GB (IDE/ATA)	20 GB (IDE/ATA)	20 GB (IDE/ATA)
Example Hardware <i>Please contact your Honeywell representative for Honeywell-supplied platform details.</i>	Dell Precision Workstation 340	Dell Precision Workstation 360	Dell Precision Workstation 370
Note 1 – If the PC will be used for multiple displays, 512 MB is required with a Video card utilizing 32 MB of VRAM per Port.			
Note 2 – 10 Mb Ethernet Network between Servers and Stations is not officially supported, although it may perform acceptably on small systems.			

Console Station Requirements			
System Configuration	Minimum	Typical	Performance
Processor	3 GHz Pentium IV or Faster	3.2 GHz Pentium IV or Faster	Dual 2.4 GHz Xeon or Faster
RAM ¹	1 GB	1 GB	1 GB
Networking ²	100 Mbps Ethernet	100 Mbps Ethernet	100 Mbps Ethernet
Video Resolution <i>The standard resolution supported is 1280 x 1024</i>	1024 x 768 or 1280 x 1024 65K colors	1024 x 768 or 1280 x 1024 65K colors	1024 x 768 or 1280 x 1024 65K colors
Video Memory (VRAM) per channel	32 MB	32 MB	64 MB
Hard Drive	20 GB (IDE/ATA)	20 GB (IDE/ATA)	20 GB (IDE/ATA)
Example Hardware <i>Please contact your Honeywell representative for Honeywell-supplied platform details.</i>	Dell Precision Workstation 360	Dell Precision Workstation 370	Dell Precision Workstation 470
<i>Note 1 – If the PC will be used for multiple displays, 512 MB is required with a Video card utilizing 32 MB of VRAM per Port.</i>			
<i>Note 2 – 10 Mb Ethernet Network between Servers and Stations is not officially supported, although it may perform acceptably on small systems.</i>			

Operating System

The following table shows the Experion Stations and which Microsoft Operating System they are supported on:

Experion Products	Operating System	
	Windows XP Professional	Windows 2000 Professional
Flex Station	√	√
Console Station		√
Console Station Extension		√

Display Performance Specifications

	Specification
Number of dynamic parameters per display	300
Number of dynamic parameters per Station PC	1000
Maximum Continuous Display Update Rate	1 sec
Typical Field Change to Display Update Time with 100 Parameters Per Display on a Single Station	< 2 sec
Typical Display Call Up Time with 100 Parameters on a Single Station ¹	< 2 sec
<i>Note 1 – Call up time is dependent on display complexity; this excludes the first initial call up.</i>	

Experion Station – Console Specifications

	Specification
Maximum Number of ES-C per Server	10
Maximum Number of ES-CE per ES-C	3
Maximum Number of logical Console groups per Server	5

Multi-window Functionality

	Specification
Multiple Static Station Option ¹	
<ul style="list-style-type: none"> Number of Static Stations per ES-F 	Up to 4
Multiple Windows Option ¹	
<ul style="list-style-type: none"> Number of Windows 	Up to 16
<i>Note 1</i> – Multi-window Functionality allows one of two options to be implemented for an ES-F. An ES-F can be configured with either Multiple Static Stations or Multiple Windows. An ES-C and ES-CE can be configured with Multiple Windows.	

Model Numbers

Experion Station Hardware

Model Number	Description
MZ-NTPC61	Operator Station with Windows XP
MZ-NTPC31	Operator Station with Windows 2000 Professional
TP-DFP201	Desktop 20.1" Flat Panel Display
MZ-PCEB22	Ethernet Comm. Board, 100 Mbps for Station PC <i>(For FTE models, see FTE Specifications and Technical Data)</i>
MZ-PCEM24	1 GB Memory Expansion Module for Station PC
MZ-DVID01	Dual Display Video Card, 32 MB per channel <i>(for installation in the Station PC)</i>
TP-DSOEP1	Desktop Operator Entry Panel
TP-OPADP1	Operator Entry Panel Adapter to Com Port
TP-DUIKBN	Desktop Integrated Keyboard w/o Trackball, USB Interface
MZ-PCDD06	Trackball w/PS-2 Connector
EP-EPKY01	Experion Keyboard Overlay

Experion Station Software Licenses

Model Number	Description
EP-STAT01	Experion Station – Flex (1 Connection)
EP-STAT05	Experion Station – Flex (5 Connections)
EP-STAT10	Experion Station – Flex (10 Connections)
EP-SMWIN1	Multi Window Support, per connection ¹
EP-STACON	Experion Station – Console (ES-C) ²
EP-STACEX	Experion Station – Console Extension (ES-CE) ²

Note 1 – Option for Experion Station – Flex.
Note 2 – This model includes multi-window functionality.

Glossary

Term or Acronym	Description
ACE	Application Control Environment
C200	Experion Controller
CCTV	Closed Circuit Television A television system in which signals are not publicly distributed. Cameras are connected to television monitors in a limited location. CCTV is commonly used in surveillance systems.
CEE	Control Execution Environment
Cluster	Cluster Server – An Experion Server or redundant Server pair, along with its associated Stations (all types), and assigned controllers, and their I/O, SCADA connected devices, ACE Nodes, and any locally connected OPC Servers and/or subsystems, etc.
CSS	Cascading Style Sheet CSS allow you to define how HMIWeb page elements are displayed. When style sheets are applied to a new graphic, the elements are changed according to the specifications of the style.
DCS	Distributed Control System
CEE	Control Execution Environment
Cluster	Cluster Server – An Experion Server or redundant Server pair, along with its associated Stations (all types), and assigned controllers, and their I/O, SCADA connected devices, ACE Nodes, and any locally connected OPC Servers and/or subsystems, etc.
CSS	Cascading Style Sheet CSS allow you to define how HMIWeb page elements are displayed. When style sheets are applied to a new graphic, the elements are changed according to the specifications of the style.
DCS	Distributed Control System
DSA	Distributed Systems Architecture
Electronic Signature	The legally binding equivalent of an operator's handwritten signature.
Experion Station – Flex	The HMIWeb Station on an Experion PKS System used as a client station to the Experion Server. Also referenced as a "Flex Station". Acronym: ES-F
Experion Station – Console	The HMIWeb Station that is directly connected to the Fault Tolerant Ethernet (FTE) and capable of Data and Alarm access to direct data sources such as C200 controllers, Foundation Fieldbus Interface Modules, and ACE nodes in the server cluster even when the Experion Server is unavailable. Also referenced as a "Console Station". Acronym: ES-C
FTE	Fault Tolerant Ethernet: Honeywell's robust Ethernet network solution.
HTML	HyperText Markup Language
OLE	Object Linking and Embedding
OPC	OLE for Process Control
Process Points	Points originating in a CEE device such as a C200 or ACE.
SCADA	Supervisory Control and Data Acquisition
SCADA Points	Points configured to access devices via optional SCADA interfaces.
Station	Operator interface for Experion
TPS	TotalPlant Solution
URL	Uniform Resource Locator The address of a resource, or file, available on the Internet. The URL contains the protocol of the resource (e.g. http:// or ftp://), the domain name for the resource, and the hierarchical name for the file (address).

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