Manufacturing production plants require process, machinery, and advanced controls at all plant levels. Honeywell’s process, machinery and drives (PMD) technology integrated with Experion Process Knowledge System (PKS) enables production plants to have a single, integrated automation solution.

Experion PMD Release 800 now integrates with native peer-to-peer connectivity with Safety Manager, Experion MX, the Experion PKS controller family and SCADA systems through parameter connection and a single point of data entry. It also includes Experion Alarm Management, Experion Integrated Historian, OneWireless™ and Digital Video Manager solutions.

Release 800 adds a new Field Controller Express (FCE) controller with over 60 percent more controller point capacity, with integrated Profibus and TotalPlant Alcont UPLINE/IOLINE highway interface.

Experion PMD Controller is easily configurable and makes maintenance easy and cost effective. It comes with a wide range of plant control methods and high control capacity to meet the diverse needs of various industries, including pulp and paper, metals, chemicals, pharmaceuticals and food and beverage. PMD controller improves performance and ensures effective management as well as safer operation of the production line.

The new release is fully scalable and continues to support migration from Honeywell’s TotalPlant Alcont (TPA) systems. Customers migrating to Experion PMD are able to reuse many existing TotalPlant Alcont assets to minimize costs, and commissioning and start-up times. Existing TotalPlant Alcont application solutions are converted to Experion using existing cabinets, I/O and wiring so the costs of implementation can be minimized while significantly extending the life of assets.

Benefits
- Windows 2008-based server technique, Windows 7-based user interface technique and Ethernet-based network architecture allows flexible standard interfacing between the automation system’s components.
- Fault Tolerant Ethernet (FTE) in Experion PKS control network provides fault tolerance for better performance and security of industrial control applications.
- Integrated Human Machine Interfaces (HMI) for alarm and history data process, production and business data integration.
- Field Controller (FC) and Field Controller Express (FCE) with integrated Profibus and TotalPlant Alcont UPLINE/IOLINE highway interface enables the control of continuous and batch processes, and high speed rotating machines and standalone and coordinated line drives.
- Inter-department communication.

Key Features
- Experion integrated Historian.
- Experion Alarm Management.
- Ethernet-based System Net.
- Common application engineering tools for PMD applications.
- Experion native peer-to-peer communication via parameter connection and single point of data entry. Integration with:
  - C300 and C200E.
  - Advanced PMD R800.
  - Advanced Safety Manager.
  - Advanced SCADA Points.
- Process History Data (PHD) integration and PHD automatic history configuration.
- Digital Video Manager integration.
- Asset Management solutions.
PMD Controllers Support Peer Control Data Interface (CDA) for Peer Device Data Exchange

Experion PMD R800 controllers communicate with Honeywell’s C300 and C200E controllers, Safety Manager and Programmable Logic Controllers, whilst the CDA communicates over Honeywell’s FTE network. There are several benefits with a dedicated, direct communication path between the Experion controllers and Safety Manager. For example, the same transmitter could be used both in Safety Manager and as a transmitter for use in a control strategy in the PMD and C300 controller. The end result is that one transmitter can be removed.

Reliable Fault Tolerant Data Transmission

The FTE leverages commercial Ethernet technology to lower the costs of the FTE network infrastructure, connections to IT networks, connections to third-party Ethernet devices and ongoing maintenance and support.

Benefits

- Single FTE network is simpler to manage due to its configuration and performance. Analytical, diagnostic and security tools can access all equipment in the network from a single connection and can readily provide a perspective of the entire communication system.
- PMD and C300 controllers, the HMIWeb user interfaces, Design Module, Experion PKS Server and the safety system each connect directly to the System Net for reliable data transmissions between department components.
- In an Ethernet-based System Net, each operating station and operator has a high-speed, direct line of communication with the PMD and C300 controllers and other system stations.
- The Ethernet-based Transmission Control Protocol (TCP)/Internet Protocol (IP) network solution enables easy connection of third-party equipment to the common network.
- Communication in the System Net takes place using protocols of the TCP/IP family. The IP is used as the net layer and TCP or the User Datagram Protocol (UDP) as the transport layer. The data link layer is implemented using the Ethernet technique.

Key Features

- Four communication paths between FTE nodes.
- Tolerates multiple failures in cables, communication interface electronics and network’s active devices.
- Rapid fault detection and recovery.
- Transparent to PC applications.
- Allows normal (non-FTE) Ethernet nodes.
- Online addition/removal of nodes.
- No proprietary hardware.
- Minimal overhead—no duplicate messages.
- Fully distributed—no master node.
- Fast 100 Mbps performance.
- Fiber optic or shielded copper cable for noise protection.
- CE-Mark compliant.
- Full suite of services available for network engineering installation and management.

PMD Controllers

In addition to traditional process control functions, PMD R800 also manages smart motor center controls, hydraulic and pneumatic controls of machinery and coordinated line drive control solutions. Fast functions, such as machine element controls and coordinated line drives can be executed at a 20 millisecond cycle.

The control solutions are implemented with graphic model block structures that enable the use of conventional controls, logic and advanced control methods. The advanced control methods are based on type block functions, such as hydraulic and pneumatic controls, neural nets, fuzzy logic, optimization, predictive multivariable control and statistical process control.

Profibus Fieldbus Interface

The PMD controllers features two Profibus interfaces implemented in accordance with the standard EN50170 and interface DP/VO, V1, V2, Class 1 and 2 Master.

The PMD controllers include an application execution environment, which enables direct control of the process beyond the Fieldbus and any equipment installed along the Fieldbus. The Profibus Fieldbuses that are connected to the PMD controllers, as well as any associated Fieldbus devices, are configured and maintained with the standard automation system tool that also supports FDT/DDT functions.

The controllers are provided with a multi-speed TotalPlant Alcont UPLINE / IOLINE highway interface that enables the connection of TotalPlant Alcont departments and TPA rack-based I/O to the system. The PMD controllers connect to the System Net through its Ethernet interface.
Common Application Tools

By using Experion, the same graphic application tools are used to create, test, monitor and maintain control strategies for the PMD. The application tools cover both the conventional control methods and the advanced solutions.

The application tools used for system definitions, application definitions and system maintenance are located under the PMD Builder program in the Design Module, so they may be used through one window. These programs are used to determine, for example, the system structure, process control and logic functions and peer to peer data connections with the C300 controller, Safety System and SCADA systems.

The Fieldbus that is connected to the automation system and any associated Fieldbus devices are also configured and maintained with the system definitions tool.

The HMIWeb Display Builder is also available at the Design Module to create displays and pictures required for process control and operating purposes.

Hierarchical Open Application Structure

Creating an application solution is based on a hierarchical approach. This means that a process entity or a problem to be controlled is broken down into smaller parts. This kind of hierarchical top-down application structure also gives a clear picture of comprehensive complex control solutions.

The entire process can be viewed as a single complete structure, with the possibility of viewing each block with its sub-blocks separately. Ready-made extendable block libraries that are available in the system can be used for application definitions.

The application can be tested in the form of a block diagram through simulation on the design module screen. Simulation is possible by using the Design Module as a standalone device, or the application can be tested with the rest of the system and the process. This means that real-time process values can be displayed from the blocks being executed in the system. This is an efficient means to ensure that the designed application functions correctly before actual commissioning. All application modifications can also be made and tested online with the Design Module without disturbing the system and the process being controlled.

HMIWeb User Interface for Process, Alarm and History Data Integration

The Experion PKS HMIWeb user interface provides a uniform environment for process operation and process data presentation for various system processes.

The user interface transmits real-time and historical data from the process and the system, and provides tools for operating process control applications. Experion PKS’s process control applications are operated through the Experion Station Flex or Console window. The user can call up various displays and pictures (system and custom displays, pop-ups, faceplates) into the window and use them to monitor the process and change set values and other parameters.

The Station window size is easily scaled and its location can be freely moved around the screen, allowing several Station windows to be opened on the user interface simultaneously. The Station window's upper and lower parts include the tools to operate and monitor the system.

The following benefits and features are available with each Experion Station:

- The Experion HMI utilizes Honeywell’s HMIWeb technology, a Web-based architecture that allows HMI, application data and business data to be integrated.
HTML is used as the native display format to provide access to process graphic displays.

The use of industry standards, such as Microsoft Windows 7, Ethernet, HTML and the Internet, minimize operator training by providing a familiar operating environment.

Experion Station makes extensive use of configurable pull-down menus and toolbars to allow easy, intuitive navigation and fast access to key process data.

Built-in support for tabbed displays and drag and drop of trend configurations streamline the operator workflow.

Additional usability features include recently used command lists, copy and paste, live video integration, ActiveX support, scripting and launching applications.

Experion Station supports standard peripherals, including multi-display (up to four) video cards, normal keyboard, sound cards etc.

**Trend Capabilities Increase Operator Effectiveness**

The flexible trend capabilities in Experion allow trends to be preconfigured or configured online as necessary by simply browsing the database and selecting the desired point and parameter. Any of the standard Experion history collection intervals may be used as the basis for the real-time and historical trends.

Trends can display data in line or bar graphs, numerical list of historical data, or X-Y plot of the value of one point against another.

Functions providing data analysis include:

- View events in combination with trend data
- 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
- Flexible time period selectors
- Auto-scaling

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 online through standard trend displays without the need to build displays. Real-time and historical data are presented together on the same trend.

**Alarm and Event Management**

Process and system alarms and events are collected on chronological lists by the Experion PKS Server. The lists are available on the user interface (Alarms and Events displays) and can be handled with various functions.

The PKS Server collects and distributes history data to various user interfaces. The server provides history collection functions to meet normal process control requirements. History data can be collected over a wide range of time spans and can be presented in both average and snapshot formats. The collected history data is available online in the server's real-time database or the data can also be archived automatically for subsequent use.
Archived history may be accessed automatically by simply scrolling to, or directly entering, the appropriate time and date.