PROCESS CONTROLLER OF THE FUTURE

How Companies Can Benefit from a Modern, Unified Process Control Platform

Honeywell

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INTRODUCTION

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Today's competitive global marketplace demands industrial automation solutions that increase efficiency and profitability. Process control performance can have a significant impact on the bottom line for manufacturing facilities.

With the right control technology, companies can improve operational performance, reduce costs, and ensure regulatory compliance while meeting requirements for better product quality and faster delivery.

DRIVING TECHNOLOGY UPGRADES

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Experience has shown that an effective strategy of control technology upgrades can help organizations reduce total cost of ownership, increase production rates, manage risks, extend the life and performance of systems, and improve response to changing business demands.

The need for enhanced automation capabilities means plant owners/operators must make technology decisions based on various critical factors, including control reliability, data configurability, plant-wide architecture support, and standardization and system integration.

Figure 1: In today's competitive environment, process control performance can have a significant impact on a plant operator's bottom line.

PROTECTING CAPITAL INVESTMENTS

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As a global leader in industrial process control, Honeywell has been committed to continuous technology evolution for over 45 years. This approach has resulted in key innovations helping customers to achieve operational excellence and capture greater value from automation solutions.

With Honeywell's strategy, the linearity of capital investments, together with efficiency and performance improvements, are fully supportable based on incremental modernization and upgrades. The company's objective is to provide long-term investment protection for control strategies and wiring; enable system migrations at the customer's own pace, based on their specific business needs; and allow integration of legacy solutions both today and in the future.

ADVANCING AUTOMATION SOLUTIONS

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From the introduction of the xPM family of controllers, beginning with the Process Manager (PM) in the 1980s, to the Advanced Process Manager (APM) in the early 1990s, the High Performance Process Manager (HPM) in the late 1990s,2000s and, most recently, the Enhanced High Performance Process Manager (EHPM), Honeywell has continued to advance automation solutions to keep pace with industrial manufacturing around the world.

Honeywell launched the C300 controller to provide even more powerful and robust process control for the Experion PKS platform. Based on the unique and space-saving Series C form factor, the C300 operates Honeywell's field-proven and deterministic Control Execution Environment (CEE) software.

The C300 supports a wide variety of process control applications, including continuous and batch processes and integration with smart field devices. Continuous process control is achieved through an array of standard functions that are built into control strategies.

In 2012, Honeywell's EHPM solution redefined modern process controllers. It evolved the technology of the classic TotalPlant™ Network (TPN) control environment in small incremental steps. The EHPM retained the support of control/safety functions and major capital investments while modernizing the traditional TPN coax network to the unified TPN/Experion® Process Knowledge System (PKS) control environment. This solution also provided a step-wise modernization path for HPM controllers, allowing end users to take advantage of modern control network technology while protecting existing control schemes and applications, and extending system support.

Figure 2: Honeywell launched the C300 controller to provide powerful and robust process control for the Experion PKS platform.

UNDERSTANDING CUSTOMER NEEDS

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Honeywell has long been committed to listening to customers and understanding their unique process control requirements.

The company is focused on meeting their needs with control solutions that are cost-effective, scalable and offer a low total cost of ownership.

Honeywell has taken its best-in-class control technology a step further by offering the true process controller of the future with all the features customers want in a single, integrated device.

Leading process industry organizations asked for a control solution that enables users of the proven EHPM solution, which integrates the control environment of the TotalPlant Solution (TPS) and TDC 2000/3000 and Experion PKS systems, to take advantage of the same advanced features offered by the C300 controller.

In response to customer input, Honeywell has introduced the C300PM—the ideal solution for plant owners/operators seeking to upgrade from legacy xPM controllers to new technology, that want a modern, unified controller platform. With this flexible solution, Honeywell supports the retention of decades of valuable customer control strategies throughout their lifecycle. There is no need to change Advanced Process Control (APC) and base regulatory control strategies, rebuild points or modify operator display graphics. Instead, end users can focus on investments with the highest return.

The C300PM shares hardware elements with other members of the Experion controller family, the C300 and ControlEdge UOC. This eliminates concerns about end of life concerns and providing a secure evolutionary path to the latest technology.

Companies undertaking plant renovations or unit expansions can now upgrade their controller installed base with a solution that provides a common engineering environment and eliminates the need to replace existing hardware.

OPTIMIZING CONTROLLER DESIGN

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For the Honeywell installed base, the C300PM provides the best of both worlds—combining the features of the EHPM and C300 in an EHPM form factor. This solution enables users to seamlessly evolve their EHPM installation to gain access to the most advanced Experion PKS control functions and capabilities.

Figure 3: The C300PM combines the features of the EHPM and C300 in an EHPM form factor.

Like other modern Honeywell controllers, the C300PM utilizes an advanced Control Execution Environment (CEE), which brings forward decades of Honeywell controller development and technology and provides a deterministic, consistent, and reliable control execution platform. The CEE is loaded into the C300PM controller, enabling execution of a comprehensive set of automatic control, logic, data acquisition and calculation function blocks. Each function block contains a set of pre-defined features such as alarm settings and maintenance statistics. This approach guarantees consistent process control strategy execution. The end user develops plant-specific control strategies by selecting the desired function block from the library and interconnecting the correct inputs and outputs from I/O modules and field sensors and transducers.

By upgrading to the C300PM, xPM controller family users no longer have to develop custom functionality to obtain the same level of performance as the C300 controller in demanding applications such as blending and batch processing. They can take advantage of increased processing speed for their critical control loops. Peer-to-peer communications between different generations of controllers helps to optimize overall system performance.

The C300PM solution utilizes Custom Algorithm Block (CAB) functionality, which leverages user-defined algorithms and data structures to greatly reduce the effort required to create complex and efficient control strategies. Control strategies created in CAB work just like other function blocks in Experion controllers. CAB function blocks can be instantiated as required to save time and effort in replicating and expanding processes.

In addition to PMIO, the C300PM also incorporates Experion PKS I/O HIVE (Highly Integrated Virtual Environment), which uniquely decouples the assignment of Input/Output (I/O) modules. The Experion HIVE I/O network provides a fault-tolerant, high-speed field network that allows the controller to communicate with Series-C and distributed Universal I/O via the CN100. The I/O can be programmed with a subset of controller functionality, enabling full peer-to-peer control in the field and back to the control center. If needed, control can be entirely in remote process cabinets in the production areas.

The C300PM supports many leading industrial communication protocols, including Peer Control Data Interface (PCDI), Profinet, EtherNet/IP, OneWireless™, FOUNDATION Fieldbus and Profibus.

SIMPLIFYING TECHNOLOGY UPGRADES

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Honeywell responded to customer requests for a secure and reliable solution for controller migration. Thanks to the C300PM, end users can retain decades of engineering configurations and focus on the new strategies that offer the most value when upgrading from the PM family of controllers. This solution eliminates concerns about changing the controller platform, modifying control strategies, and replacing I/O devices.

Honeywell provides on-process migration for easy access to valuable new capabilities without unnecessary downtime and production losses. It delivers all the tools and services needed to address cost, risk, and resource issues.

xPM users can take advantage of a familiar migration technique to C300PM, which allows them to preserve their valuable intellectual property without having to deal with issues such as rewiring, system reconfiguration and graphics migration. The move to C300PM can be completed without the need for a shutdown for controller replacement. This is done as part of a simple, painless on-process migration. With the legacy controller installation, users performed text-based configuration for control functionality and Control Language (CL) programs in the

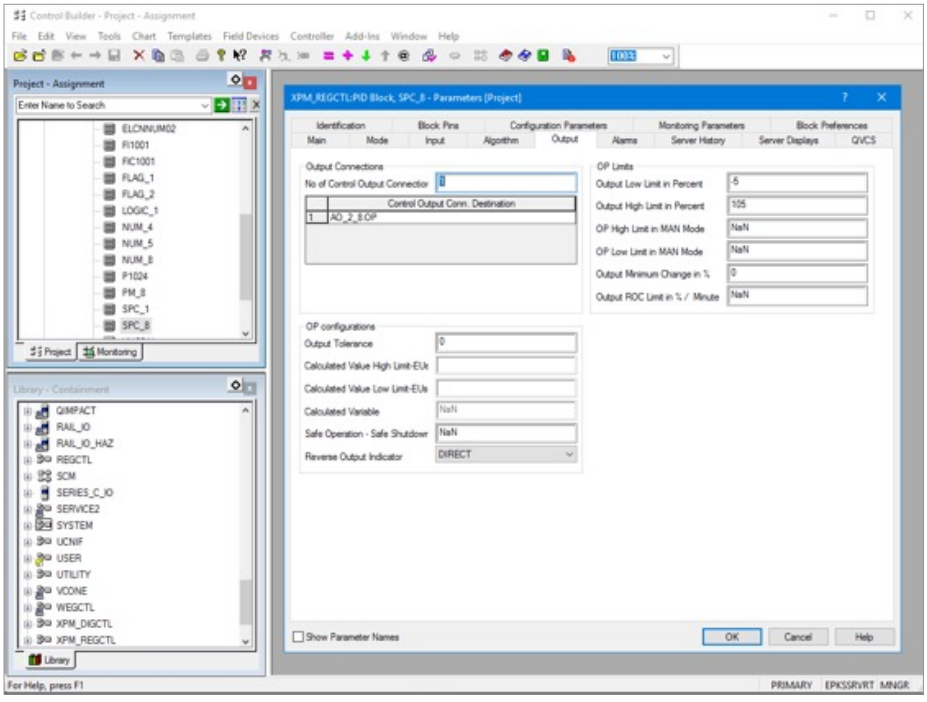

Figure 4: Within Honeywell's unified engineering environment, the same Control Builder tool can be used to configure controller points and create, edit, and compile control logic programs.

native Window environment. Moreover, different tools are required to configure different generations of controllers with no consistency in the user experience.

We modernized the set of tools into Control Builder to provide a unified experience. The result of the unification of tools is a more user-friendly modern interface for the new generation of engineers.

Honeywell has established a unified engineering environment where the same engineering tool—Control Builder—is used to configure the Experion family of controllers. With this graphical configuration tool, customers are able to create and download the control strategy to be executed by the controllers.

Control Builder simplifies the task of building and configuring controller points, as well as creating, editing, and compiling CL programs. This capability saves engineering time and eliminates potential conflicts and errors.

In addition, Honeywell supports the HART Integration to provide a fully integrated capability for field device monitoring, asset management and equipment maintenance. This capability provides an end-to-end solution from the field connection level to the supervisory control level and beyond. The solution allows the use of HART parameters such as SV, TV, QV, among others to be part of control strategies.

Honeywell customers can take advantage of the same HART data pass-through with the C300PM as it currently does with the C300. Process and status data are automatically populated through I/O cards into the process controller—and finally into standard operator displays—with no additional configuration required. This solution also provides a pass-through capability that enables full asset management using Honeywell's innovative Field Device Manager (FDM) application.

The HART integration solution is part of Honeywell's continuous evolution enabling customers to upgrade to the latest Experion PKS technology while retaining their existing controls investments. while enabling a host of robust HART functionalities.

BENEFITTING INDUSTRIAL OPERATIONS

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Honeywell's long track record of innovation has once again been demonstrated with the development of the C300PM controller. This integrated device offers all the features that industrial plant operators need to evolve their process control capabilities with the latest Experion PKS technology, while preserving valuable intellectual property and extending the value of their existing control system investments.

The key features and benefits of this solution include:

- Best of the EHPM and C300 worlds for automation end usersMulti-generational coexistence of process controllers
- Robust peer-to-peer communications and control
- Unified engineering environment and system management
- On-process hardware migration/infrastructure refresh
- Builds on foundation of existing intellectual property
- Enables use of a single engineering tool for controller configuration
- Provides direct HART data integration for smarter asset management

CONCLUSION

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Honeywell's C300PM process controller is a significant new offering for existing customers who have asked for the legacy EHPM to have the same functionality as the advanced C300 when developing their control platform migration plans.

The C300PM is a controller that is future proof. It embodies the legacy of the xPM platform while embracing the latest control capabilities in the C300 following and evolving with the same hardware platform of the Experion family of controllers.

For more information

Visit www.honeywellprocess.com
or contact your Honeywell Account Manager.

Honeywell Process Solutions

1250 West Sam Houston Parkway South
Houston, TX 77042

Honeywell House, Skimped Hill Lane
Bracknell, Berkshire, England RG12 1EB UK

Building #1, 555 Huanke Road
Zhangjiang Hi-Tech Industrial Park
Pudong New Area, Shanghai 201203

www.honeywellprocess.com

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