

A NEW PARADIGM OF CONTROL SYSTEM TECHNOLOGY.

Project Execution with Experion® PKS Honeywell Integrated Virtual Environment (HIVE)

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MANAGEMENT SUMMARY

The world is changing at an unprecedented pace. In the connected global economy, business decisions must be agile and accurate. Processes must execute with speed and efficiency.

Projects must be completed on time and within budget. Knowledge workers must have the ability to quickly react to changing circumstances with confidence based on available and precise data. Technology must enable success, not hinder it.

As we know, there are few technology environments more complex than those required for industrial control systems. These environments must incorporate critical functions including cybersecurity, redundancy, high-speed networking and deterministic operations. With these capabilities, customers control safety critical process manufacturing facilities with the highest levels of reliability.



We are making business decisions faster and more precisely.

Process control systems have served the industry well over 30 years. Yet I'm convinced we have only scratched the surface of what is possible. There are still many opportunities to harness the power of new technology to make a step change in benefits. By example, the industry continues to have an opportunity to drive down capital cost by shifting from customization to standardization and eliminating significant amounts of non-value-added work. Further, with installed systems, we see the possibility to continue improving operations by converting data into knowledge and transforming knowledge into more precise action.

Ultimately, the industry has more opportunity to execute projects in less time with lower risk while improving throughput, quality, and operational reliability. Decades of implementations and customer collaborations have armed Honeywell with first-hand knowledge of the pain points impeding project efficiencies and also limiting customers from achieving and sustaining best operations. Helping customers to overcome these roadblocks has resulted in a fundamentally new approach to deploying and operating industrial control systems – Experion PKS HIVE.



THE FOUNDATION OF HONEYWELL LEAP

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Focused on taking automation out of the critical path, Honeywell's LEAP™ is a paradigm shift in the way automation projects are implemented.

Introduced in 2014, LEAP removes the traditional dependencies that used to force project flows to be sequential in nature by combining Universal IO, virtualization, virtual engineering, and automated commissioning.

The result? Separating physical from functional design, breaking down task dependencies, using standardized designs, and enabling engineering to be done from anywhere in the world can result in significant risk and cost reduction.



INTRODUCING EXPERION PKS HIGHLY INTEGRATED VIRTUAL ENVIRONMENT (HIVE)

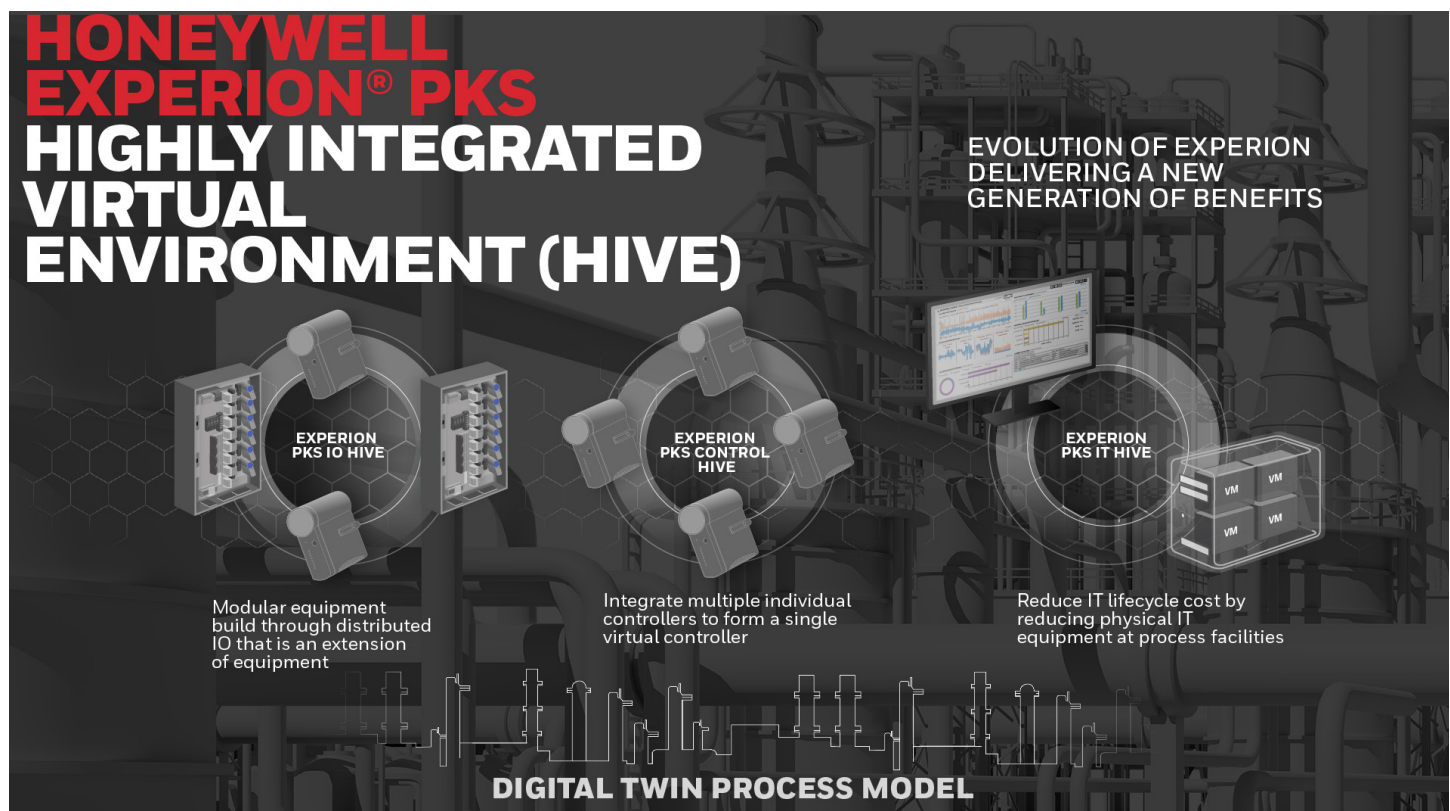
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Experion PKS HIVE is a new generation of control system technology that uses LEAP project execution principles, software and networking to unchain control applications from physical equipment, and controllers from physical IO.

This enables control systems to be engineered and implemented in less time, at lower cost and risk, and with simpler, modular builds.

The solution also transforms the way control systems are maintained over their lifecycle, shifting day-to-day management of servers to a centralized data center, where experts and established protocols mitigate cybersecurity risk, allowing plant engineers to focus more proactively on control system optimization.

Eliminating complexity. Decoupling control from the physical platform. Reducing IT costs. These are some of the tenets that shatter the roadblocks preventing simplified control system design, implementation and lifecycle management for project operations. Let's take a look at the components.



AN IO HIVE: MOVING IO TO THE FIELD BY SHIFTING THE PROCESS CONTROL SYSTEM CLOSER TO PRODUCTION UNITS

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Control centers are notoriously jammed with customized system cabinets along with massive amounts of wiring that have little documentation. Experion PKS IO HIVE allows you to make a step change improvement in the cost profile of these projects by distributing the control system closer to the process equipment so you can achieve greater project savings with fewer wires, reduced engineering hours, and less space requirements.

Some forward-thinking facilities have already implemented remote IO strategies to seek reduction in project costs. But there's more opportunity inherent to these efforts. Experion PKS IO HIVE pinpoints a new generation of benefits to facilitate modular and parallel project execution.

To achieve the new generation of benefits, Honeywell starts with a highly resilient, high speed Ethernet field IO network that connects controllers to Honeywell's Universal IO mounted in the production areas. As the foundation for IO communications, the Experion PKS IO HIVE network is cybersecure, with a built-in firewall and enhanced with encryption technologies where needed while providing the technology to accommodate an inevitable increase in the amount of sensed data. With this foundation, Experion PKS HIVE can offer the following new benefits:

- **Universal IO Discovery** – provides the ability for any Experion controller to access any IO module and channel on the Experion PKS IO HIVE network. This is a step beyond the traditional approach of controller to IO communication having a direct 1-1 physical connection between controller and IO cabinet. This new approach eliminates a significant amount of planning and manual work by seamlessly allowing any controller to communicate with any IO without restriction. Now, you can engineer the control strategy, assign it to a controller and it will automatically find its relevant IO. The benefit? Significantly lower project engineering planning and engineering.
- **Packaged Control** – provides a simple software option to deliver fully redundant control with high speed performance. Ideal for packaged equipment, the control capabilities are a subset of the Experion controller, providing regulatory, sequence, and logic controls completely eliminating the need for complicated subsystem integration.

- **Universal Wireless Hot Spot** – provides wired or wireless communication to field instruments in addition to enabling each field IO box to be a wireless hot spot. This enables field workers to execute digital procedures with live access to control system data during commissioning and operations.
- **Modular Commissioning** – provides the ability to commission field IO cabinets independent of the control system. With this capability, you can run Experion controllers on a laptop, plug directly into the remote cabinet at a module yard and perform a set of commissioning activities as if you are connected to the rest of the control system. With this flexibility, modular builds spanning multiple yards becomes simple.

These combined capabilities provide significant engineering benefits, enabling projects to execute in less time with lower risk. For example, eliminating the risk and re-work inherent to late changes ensures that automation does not become the critical path. Adding a new IO as a result of change simply extends the Experion PKS IO HIVE network without requiring complicated changes to the control system.



IO HIVE – de-centralizing process control; IO becomes an extension of existing equipment.

A CONTROL HIVE: THE POWER OF A SINGLE VIRTUAL CONTROLLER

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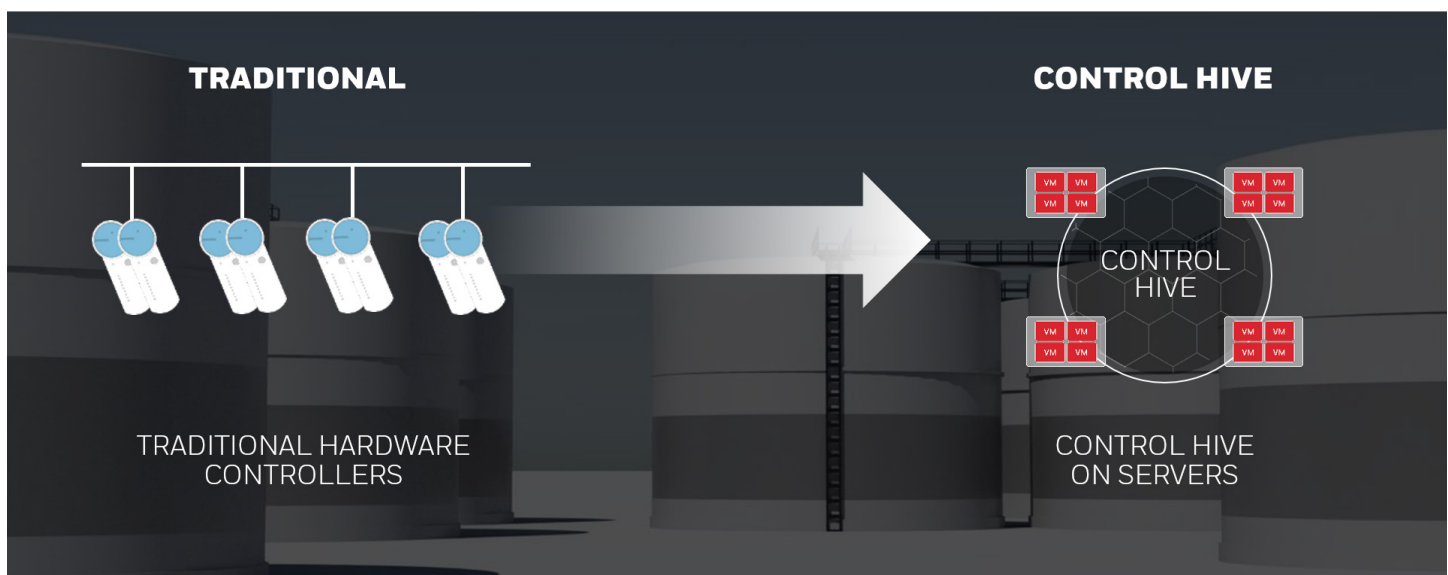
Traditional control engineering during a project requires meticulous planning since it is driven by a rigid hierarchical approach defined by a tightly bound physical relationship between controllers and IO.

Inefficiencies, re-work and risk materialize during seemingly inevitable late changes to IO or controls that require a physical reconfiguration of the entire system.

Experion PKS Control HIVE uniquely addresses this challenge by allowing multiple physical controllers to appear as a single virtual controller – a Control HIVE. In essence, this is like a controller data center where process controls can be automatically load balanced across the available controller compute. The advantages are powerful, especially when applied to the processing of late changes. With the Control HIVE, control strategies no longer need to be manually assigned to specific physical controllers.

Consider the following results:

- Eliminating assignments of controls to specific physical controllers; control strategies are assigned to the Experion PKS Control HIVE container.
- Automatically allocate and load balances controls to available controller compute, saving time and promoting efficiency since a physical configuration is no longer a roadblock—any controller can communicate with any IO.



Control HIVE – universal software-based control operates on any hardware platform.

AN IT HIVE: REDUCING PROCESS CONTROL IT COSTS

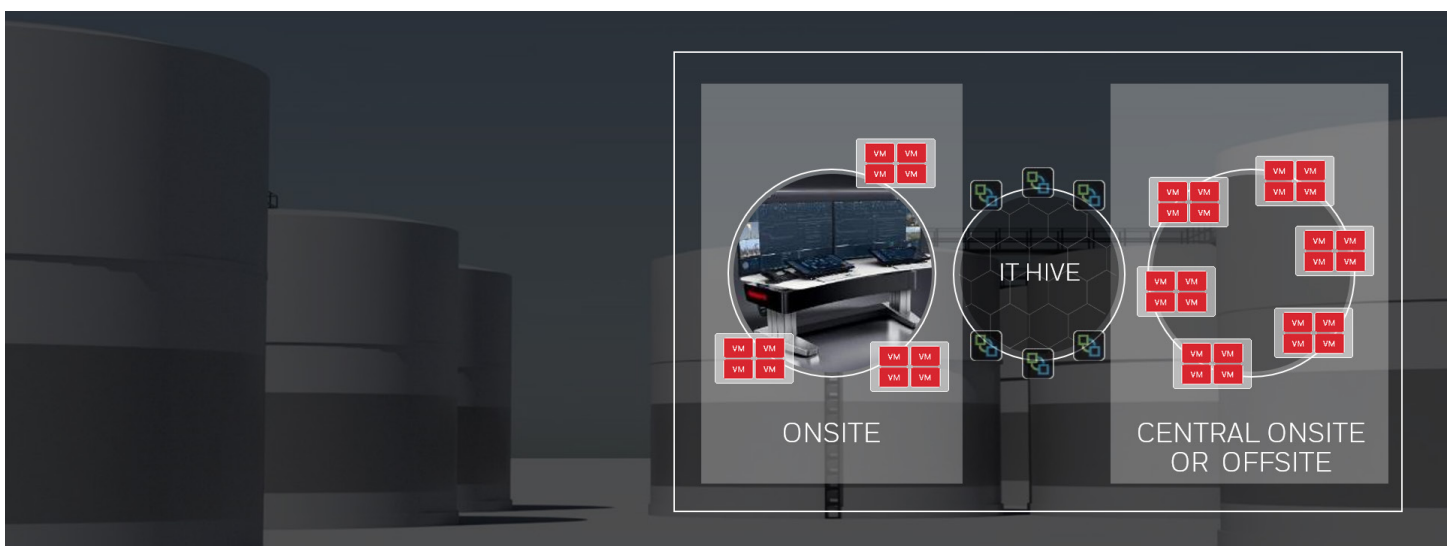
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Honeywell's virtualization technology reduces IT costs by eliminating the amount of physical IT nodes by as much as 80%. However, even with that effort, a large IT infrastructure remains onsite for reliability and scope of loss reasons.

Experion PKS IT HIVE continues the mission to lower project delivery and lifecycle costs by using the power of virtualization and replicating virtual machine files from offsite to the onsite location.

The result is a fault tolerant architecture that enables you to operate and manage your system from a central operations center or your regional data center. By shifting the majority of your process control IT infrastructure, central operations now become possible - eliminating a significant amount of cost associated with control system IT infrastructure that is typically deployed at each industrial facility. And, with Experion PKS IT Hive, we can do so with the same level of high reliability that is expected for critical process control.

This approach to multi-site consolidation enables the standardization critical to an efficient foundation for maintaining the process control IT infrastructure – considerable when deploying Experion PKS IT HIVE on an enterprise scale. For example, consider the simplification in assuring consistent deployment of Windows patches, antivirus updates and Experion releases. The result? Process control engineers can focus on optimization rather than performing administrative tasks.



Experion Data Center – reduce process control IT cost by distributing your process control IT systems to a central data center.

CONCLUSION

Experion PKS HIVE fundamentally changes how we think about the relationship of assigning devices to IO modules, control strategies to controllers, and compute resources to servers.

For example, rather than physically running fiber optic cables from a central control room to add a field cabinet, the cabinet is added to the Experion PKS IO HIVE and benefits from Universal IO discovery.

Adding a controller to increase spare capacity? Traditional processes would require rebalancing the control or moving control strategies—and their related IO modules—as well as recommissioning devices. Contrast these late change scenarios with the Experion PKS HIVE process:

1. Add a cabinet to Experion PKS IO HIVE.
2. Add another controller to Experion PKS Control HIVE.
3. Load new control strategies.

Project speed and efficiency by eliminating work. Decoupling the assignment of IO modules and control strategies from specific controllers. Enabling knowledge workers to focus on the entire group (or HIVE) of controllers. Honeywell. Delivering a fundamentally new approach to engineering and maintaining industrial control systems. Are you ready for the next generation of benefits?

For More Information

Learn more about Honeywell Experion PKS,
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