

Product Information Note

Experion PKS FMC722 Subsea Automation Integration



FMC722 integration provides seamless interface of the topside control system to the subsea automation system using the C300 controller environment. This provides fully redundant integration without dependencies on OPC and other intermediate hardware. Experion® PKS – The Knowledge to Make it Possible.

Topside and Subsea Operations

A subsea production system includes a wellhead, valve tree ('x-mas tree') equipment, pipelines, structures and a piping system, and in many instances, a number of wellheads are operated from a single location. The FMC subsea automation system provides operation of valves and chokes on subsea completions, templates, manifolds and pipelines. The overall operations of the production field are carried out from a topside production facility (a platform, a floating vessel or an onshore production facility), and satisfactory performance of the overall control system is critical for ensuring continuous production and safety of environmentally critical operations. A robust integration of the subsea automation system with the topside control system is critical for ensuring reliable and safe operations.

Honeywell provides integration of the FMC subsea automation system with Experion® PKS. Providing native support for the FMC722 protocol on the Experion PKS C300 controller enables seamless integration of the subsea automation system into the topside control system.

Seamless Integration

The native support of the FMC722 protocol in the C300 controller eliminates the need for intermediate interface modules / protocol converters, leading to faster response times and a dramatic increase in reliability and safety of field operations. Seamless integration also ensures that future developments to the FMC722 protocol can easily be integrated in future Experion developments, leading to lower cost of ownership through the system lifecycle.

With the subsea automation system integrated into the topside control system, any changes in operations philosophies like an

interlock change or shutdown sequence can be carried out with little effort and time delay leading to higher production uptimes and reducing time for first oil productions.

Subsea automation integration provided with Honeywell's flagship controller ensures that all future developments in Experion PKS technology will be available for the subsea production systems. Native C300 controller support does not require any OPC servers, leading to less hardware and avoiding the need for multiple databases.

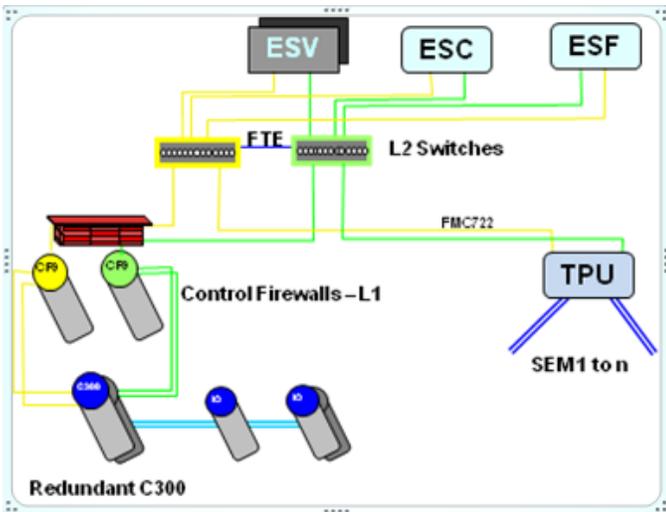


C300 Controller

Open Technology

The Honeywell solution communicates using the FMC722 protocol over the universally accepted TCP/IP as the media interface, making the overall connectivity simple and avoiding the use of proprietary interfacing hardware and cabling.

Adoption of the TCP/IP interface allows easy expansion of the systems as new wells come up for production by simply adding new controllers to the Ethernet network.



Solution Architecture

An FMC Topside Processing Unit (TPU) communicates with multiple Subsea Electronic Modules (SEM). The TPU connects to the fault tolerant ethernet (FTE) switches in a redundant configuration and communicates with the C300 using the FMC722 application protocol implemented on top of the TCP/IP transport. The solution utilizes C300 Custom Algorithm Blocks (CAB) to process and exchange the FMC722 data stream between the C300 and TPU's. Multiple TPU's can be connected to a C300 controller. The C300 controllers are programmed using Control Builder, which is a function block based DCS engineering tool. The FMC722 blocks are part of the Control Builder and use the same engineering environment as for any other conventional DCS configurations. This provides a uniform engineering environment for the subsea and other topside control strategies. The solution supports specific subsea applications like:

- **Production Choke Valve (PCV)** - Capable of issuing commands in steps, percentage, spanning over time, making immediate steps, and syncing
- **Tree Actuated Valve (XV)** - Valve logic services a pair of digital outputs, one from TPU-A and one TPU-B, and is capable of issuing commands to both TPU's simultaneously.

- **Surface Controlled Sub-Surface Valve (SCSSV)** – Similar to the tree actuated valve application, but additional control for dual actuated valve
- **Valve Signature** – Archive and display of the valve signature
- **Down Hole Flow Control (DHFC)** – Down hole flow control is implemented in the C300 controller.

The C300 transparently handles redundant communications to the TPU. Any failures of the TPU or SEMs are automatically managed by the voting logic in the C300 controller to choose the valid process values from the TPUs. Any communication failures are annunciated on the Experion Alarm Summary where screen operators will be able to rapidly identify the area of communication failure, therefore minimizing any impact to normal operations.

The solution also provides subsea specific faceplates and shape libraries to provide an intuitive process view for the operators. Faceplates are provided for the Choke, Valve, DI and AI.

Real Benefits

- FMC722 integration with the C300 controller provides all the benefits of a robust industrial solution, such as:
- Fully redundant hardware, power distribution and communications
- Honeywell patented Fault Tolerant Ethernet instead of standard Ethernet
- No need for intermediate hardware or OPC
- On process migrations to future releases
- Suitable for harsh environmental conditions
- Peer to peer between topside & subsea controls
- Uniform engineering and operations environment for topside and subsea
- Easily scalable to include new production wells, injection wells, subsea pumps and manifolds - Additions can be done online with no interruption or risk to the running facility.

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For More Information

Learn more about Honeywell's Experion PKS, visit our website www.honeywellprocess.com or contact your Honeywell account manager.

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