

Automation and Control Trends Impact Food Processing and Packaging Machine Integration

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Food processing and packaging machines have similar automation and motion control needs such as material conveying and positioning, heating, drying, and cooling. There are a couple of emerging trends as factories move toward integrating their food processing and packaging machinery more closely for continuous flow production.

Machine integration requires tight control synchronization within each machine, from machine-to-machine and from each machine to the plant control. Flexible production requirements on volume, machine-to-machine processing speeds, product changeovers, tighter temperature controls, machine-to-machine configurations, and merging lines are all raising control complexity.

Using [soft PLCs](#) (IEC 61131-3 standard) and motion controllers that provide graphical CAM and gearing design (such as Kollmorgen's [Pipe Network™](#)) address this increasing complexity by greatly simplifying and shortening the design process so that lines may be built and/or changed over quickly and easily. Built-in simulators in the software offer the ability to simulate the interaction amongst each machine and motion element which greatly increases the ability to iterate designs.

Ethernet based networks such as EtherCAT®, Ethernet/IP®, and Profinet® are making it dramatically easier to connect both the system components and separate machines sections to one another as well as to the factory level systems.

The integration of traditionally separate discrete and/or end-of-line packaging machinery types with food processing machinery is driving the need for IP-67 rated devices such as motor and I/O modules capable of withstanding machine washdown processes. Instead of packaging machinery residing in a different, cleaner/drier area of the plant it is now one and the same with the washdown requirements of the food processing machinery.

The future promises more integration and higher performance (faster machine speeds = more product in less time). This will manifest itself in greater demands on the networks and the motion control elements. It is likely that some network solutions will fall by the wayside when they are unable to meet bandwidth requirements in these faster, more tightly integrated architectures. The standardization around the IEC 61131-3 soft PLC solution will make the automation piece more routine and the focus will become how to maximize the motion solution for optimum performance.

What is a soft PLC

A soft PLC is software-based PLC, as opposed to a hardware-based (traditional) PLC.

Hardware PLCs are dedicated boxes that are programmed to do an exact job. A soft PLC is software that can be loaded onto a computer (typically an “IPC” - Industrial Personal Computer - a computer specifically built to be used in a factory environment; though a standard PC could be used) or a PAC - (Programmable Automation Controller) a dedicated piece of hardware that behaves like an IPC, but is not intended to support the open installation of other PC-compatible programs.

A customer buying a hardware PLC buys each needed unit from a specific vendor and programs it using that vendor’s specific language.

A customer buying a soft PLC is buying software that can, in many cases, be used on a variety of hardware platforms. The typical soft PLC programming environment is called IEC 61131-3, and is standardized. It incorporates the five major languages used by traditional hardware PLC vendors (hardware PLCs have been around much longer). Most users will find they know one of the five languages and can begin programming quickly. Also, because it is a standard there is a higher degree of transportability and reusability in soft PLC programs. This is not the case with hardware programs that are specific to the hardware they are written for.

Each has its place, but more and more new applications are using soft PLCs because of the lower cost and higher flexibility.

ABOUT KOLLMORGEN

[Kollmorgen](http://www.kollmorgen.com) is a leading provider of motion systems and components for machine builders around the globe, with over 60 years of motion control design and application expertise.

Through world-class knowledge in motion, industry-leading quality and deep expertise in linking and integrating standard and custom products, Kollmorgen delivers breakthrough solutions unmatched in performance, reliability and ease-of-use, giving machine builders an irrefutable marketplace advantage.

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