# Drive & Control profile

Viewpoint

## Open Core Engineering Adds New Freedom to Machine Automation Programming

In the world of machine automation programming, there has been an ongoing effort to make programming languages and platforms easier to use, more accessible, and more "open" to speed machine commissioning. And while standards such as IEC61131 and PLCopen have helped improve machine automation programming, "open" is a relative term.

Many programmers—including those recently out of school, or with backgrounds in computers, networking, and Web applications—are well-versed in standard programming languages like C++, Visual Basic for Applications (VBA), and Java, or mobile platforms such as Android and Apple iOS. When they start working in an industrial environment, the first thing they face is learning to program automation applications using languages that are very specific to industrial controls, most often based on ladder logic. These programmers may have innovative ideas for new applications that can be created with higher-level languages commonly used in the IT world.

But translating those ideas into applications using traditional PLC programming tools can be difficult and time consuming. For example: if



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a machine builder wants to offer his customer a data-gathering application that automatically captures and generates Excel reports on specific machine sensor data, a programmer would typically use Microsoft's VBA to write some simple code to capture that data.

However, it can be challenging to have that application communicate with PLC platforms using the VBA language—and if you want that

application to have a mobile app interface that runs on both iOS and Android devices, the challenges multiply. It can be done, but it can take multiple software steps, instead of simple function blocks.

It's time to bridge the gap with common languages and a platform that more easily "opens up" industrial controls programming to the wider world of higher level languages. This doesn't mean leaving IEC 61131/

PLC languages behind—they are amazing tools that deliver great performance for many of the fundamental automation tasks they were designed for.

A new automation functionality in the form of Open Core Engineering is helping address this need. Open Core Engineering is a new approach to machine automation programming that combines the previously separate environments of PLC platforms and IT programming into one comprehensive software portfolio.

With Open Core Engineering, the PLC "core" kernel is opened to enable programmers who use IT industry standard development tools such as C++, VBA and Java to create automation functions and applications, as an alternative to utilizing IEC61131 and PLCopen programming environments.

Open Core Engineering is based on a portfolio of software tools, function packages and support for higher-level languages. It helps streamline the automation engineering workflow, from initial configuration to actual production operations. Detailed and time-consuming machine process programming can now be replaced by a simple assignment of parameters.

Although it was previously possible to create automation applications and motion sequences using higher-level languages (instead of PLC/IEC 61131-compliant tools), the process of integrating the programs written in those higher-level languages could be convoluted and difficult to accomplish efficiently. If a machine builder wanted to include a new type of remote diagnostic capability for example, building that capability into the machine's operating system using standard PLC programming languages might not be easy, and integrating it into the PLC may require added resources such as the purchase of a specialized translation module, revisions to PLC firmware or support from an outside PLC programming consultant.

For external applications, a library of Open Core Engineering functions utilizes a programming interface (Open Core Interface) to allow programmers to create high-level language-based applications that communicate directly to the core of the PLC. Up to this point, PLC authoring platforms have typically been standards-based proprietary systems, custom-designed by PLC controls providers.

Open Core Engineering will "open" up a new range of possibilities for flexibility and productivity. It means more innovation, as software professionals and programmers who are experienced with technologies like mobile platforms and smartphones will not necessarily need to become experts in IEC 61131 PLC programming languages. The end result is that OEMs and end-users will have a wider range of programming ability to improve machine automation performance.
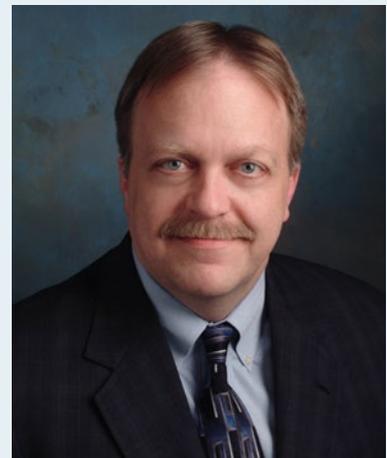
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