

## Midrange Architecture Addresses Needs of Machine Builders

By David W. Humphrey

### Summary

Continuous innovation is the driver that keeps today's machine builders ahead of the competition. Whether production or packaging machines, handling equipment or machine tools, machine builders recognize the necessity to continuously improve -- to keep inventing -- as a strategy to stay ahead. To support this process, machine builders rely on modern automation architectures that support and enhance new innovations.

### Integration is the Key

The centerpiece of a modern control architecture is the concept of the programmable automation controller (PAC), a platform that supports multiple, concurrent control disciplines ranging from logic to motion to the management and visualization of data. PAC architectures integrate these

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disciplines by allowing applications to access data from a single, common source and communicate with each other without the need for interfaces.

In the face of fierce global competition, bringing new innovations to market quickly is crucial. An integrated automation architecture gives OEMs the flexibility and efficiency to concentrate on machine design and

function rather than programming and configuration. Modular architectures allow OEMs to standardize machine modules and produce more serial machines with less customization. With a PAC-based integrated architecture as a backbone, OEMs can design new machines from the ground up in a modular fashion, mimicking the architectural flexibility demanded by their customers.

### What Customers Really Want

Rockwell Automation, a leading global supplier of automation solutions, recently announced a new generation of its venerable CompactLogix mid-range architecture. While priced to compete on smaller machines, the des-



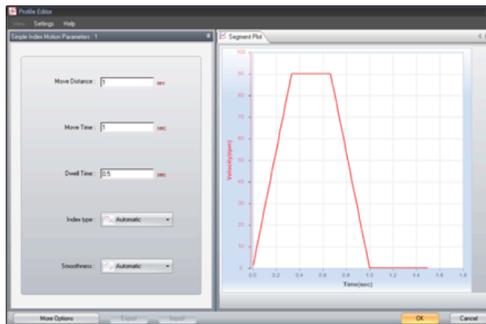
ignation is somewhat misleading. CompactLogix 5370 shares the same execution engine as the larger ControlLogix platform, and I/O can be expanded either locally or remotely via EtherNet/IP. Rounding out the mid-range architecture are Rockwell Automation's Kinetix servo drives, Stratix industrial Ethernet switches, and PanelView Plus operator panels.

The new CompactLogix mid-range architecture includes new features and enhancements that address specific needs of modern machine builders. These include:

### Integrated Motion

CompactLogix now directly integrates motion control with Kinetix 6500 servo drives over EtherNet/IP. All axis moves are planned and executed in the PAC, and then communicated to the Kinetix drives via the CIP Motion profile over the network. Servo drives now connect directly to the PAC like

intelligent I/O modules without the need for dedicated motion control modules. Not only does this simplify engineering, it also lowers the system price by reducing the number of components needed. Extending EtherNet/IP down to the motion control levels also completes Rockwell Automation's vision of a single network for everything.



**Motion Analyzer allows users to create, simulate, and optimize motion profiles long before actually commissioning axes.**

For motion applications, Rockwell Automation also offers its Motion Analyzer software, a sizing tool used for analysis, optimization, selection and validation for motion control applications. The tool's simulation features allow the quick design and validation of new machine concepts long before committing to a finished design. Users can also link 3D mechanical designs in SolidWorks 3D CAD software directly to the generation of control programs in RSLogix 5000.

### Universal Connectivity

To ensure universal connectivity from the enterprise level down to the shop floor, Rockwell Automation supports EtherNet/IP, an open network designed to meet the specific needs of industrial users. EtherNet/IP is a single network solution for all areas of industrial use, from the high-speed plant backbone network to deterministic motion control applications. Thanks to its use of standard, unmodified Ethernet, EtherNet/IP neatly bridges the gap between the corporate and manufacturing worlds with common technology that is easy to maintain.

Rockwell Automation's controller platforms offer seamless connectivity for multiple networks, including legacy networks. The key to this connectivity is the intelligent backplane together with communications modules that bridge networks independently of the PAC. The latest release of CompactLogix continues this support for current and legacy networks while adding support for motion control via EtherNet/IP.

### Modular and Scalable

The new generation of CompactLogix increases scalability by allowing users to choose CPUs based on memory size, number of local IO, and the need for integrated motion. Because PAC code is compatible throughout the range, OEMs can save money by scaling their CPU selection to match the needs of each machine. Modular hardware and program configurations and flexible tag-based addressing allow users to quickly adapt standard programs to individual machine set-ups.



**The midrange architecture enhances motion capabilities and extends system flexibility with new scalable processors.**

Other mid-range architecture components such as operator panels, servo drives and AC drives are also scalable and can be selected by size, capacity or power rating to meet individual application needs.

### One Programming Tool for Everything

With RSLogix 5000 programming software, Rockwell Automation is a leader in the trend to reduce engineering and start-up costs by integrating all automation functions in a single engineering tool. RSLogix 5000 offers functionality for integrating logic, motion and safety programming, allowing each function to access

common data in a single-tag database. Tags for HMI devices such as the company's PanelView Plus series of operator panels are also directly accessible from within RSLogix 5000. Finally, the tool also supports the configuration of drives and, for hybrid users, programming of Rockwell Automation's PlantPAx process automation system.

### Integrated Safety

For safety applications, Rockwell Automation's line includes Compact GuardLogix, safety controllers that share the same control engine and development environment as CompactLogix. In addition, CompactLogix processors and Kinetix servo drives support advanced safe motion func-

tions such as safe stop and speed monitoring, allowing OEMs to perform these functions at the servo drive level.

### **Performance and Sustainability**

PAC size and performance used to be related, meaning that OEMs had to upgrade to larger PACs if they needed more speed or capacity. With CompactLogix, Rockwell Automation now employs the same control engine across all processors, including its larger ControlLogix line, allowing OEMs to select and scale their PAC to the specific hardware needs of each machine.

With the midrange system launch, machine builders can leverage smaller components to reduce the overall footprint of the cabinets and machine, while leveraging drives that use less energy. In addition, machine builders can reduce energy consumption by eliminating pneumatic and hydraulic actuators and replacing it with the Rockwell Automation electric cylinders. With electric cylinders, machine builders can select the right power solution to meet their application needs. By reducing the demand for compressed utilities, such as air and oil, machine builders are often able to reduce leakage, maintenance of equipment and energy usage running compressors - during normal and unforeseen pauses in production.

### **Last Word**

Today's machine builders are driven by the need to streamline engineering processes, standardize machine designs, and shorten time-to-market for new innovations. These challenges require an automation architecture that supports modularity, reduces development and start-up times, and increases productivity with integrated engineering tools. Rockwell Automation's midrange architecture addresses these needs with a solution that tightly integrates disparate automation disciplines in a single platform. Machine builders can take advantage of this integrated environment to address the challenges they face in today's competitive, globalized world.

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