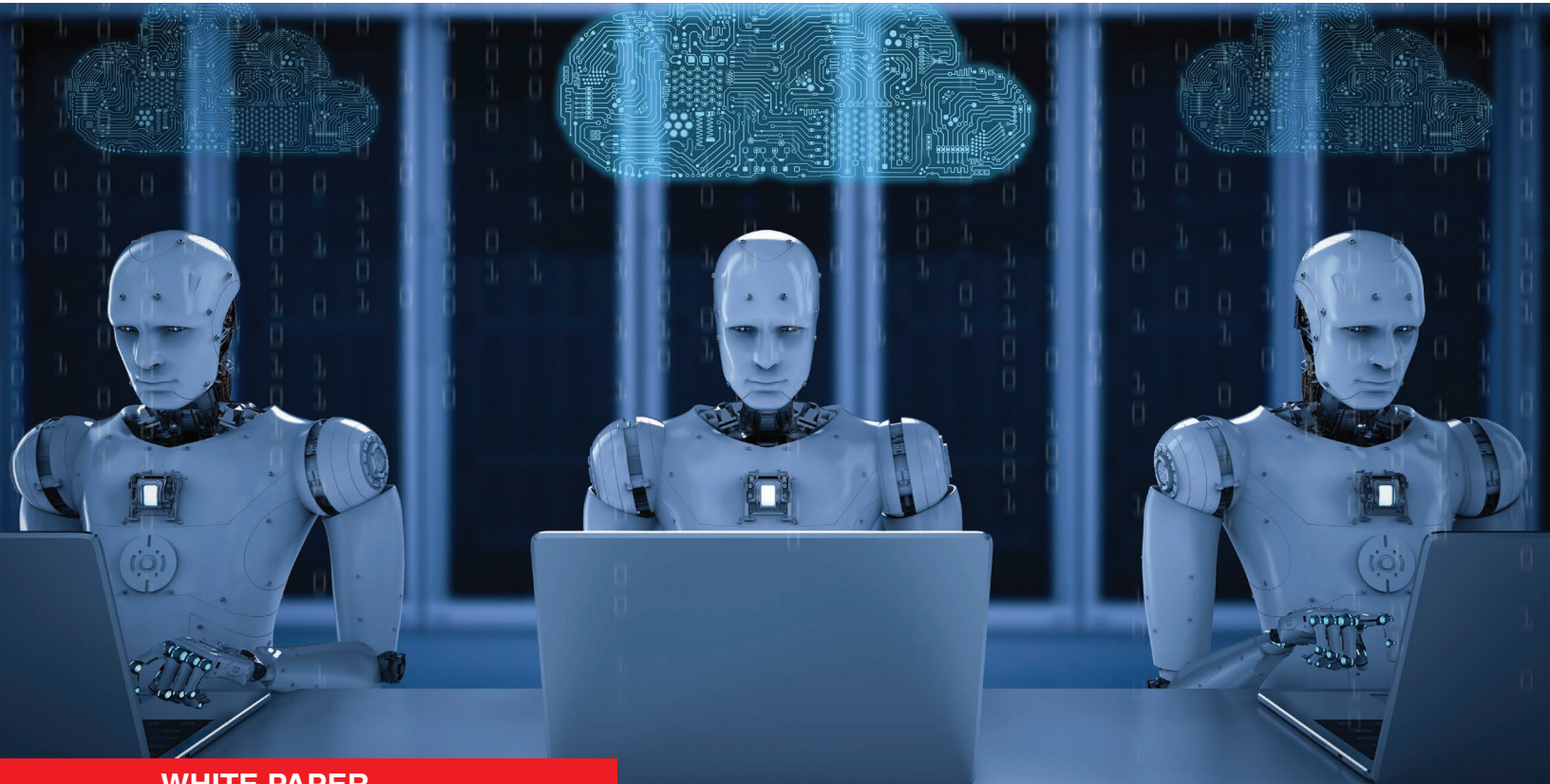




for a greener tomorrow

Optimizing Innovation in Machine Design



WHITE PAPER

Innovate faster with Pak/iQ performance programming

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Optimizing Innovation in Machine Design

Evolving Design Tools To Meet Increasingly Complex Demands

Packaging machine designs evolve at a rapid pace. The emergence of smart manufacturing and the need for smarter machines is creating a challenge in electromechanical design, information management, and robotic adoption. New vision and sensor technologies provide increased capabilities at the component level, providing faster and more accurate insight into production quality and improving throughputs.

The designer's task in evolving machine designs no longer belongs to automation programmers, but to a collaborative team of mechanical and electrical engineers, designing innovative machines that take advantage of all these advancements. Staying ahead of the innovation curve is easier if common tasks are standardized and libraries of repeatable functions are kept for re-use.

Making New Designs Easier

Case in point is the automation programming required to execute specific functions in the PLC, HMI, and servo system. For example, a typical bag filling operation always contains a cut to length function using a rotary knife. Typically, this includes a registration (position) control loop for cutting to a specific mark on the bag, adjusted from the ideal length. The act of tracking length and modifying the cut line based on detected marks on the film is a very common function and can be standardized in the PLC code as a function block. This block would also include the servo commands and the HMI status reports and kept in a master library for repeated use in subsequent machine designs. No need for re-invention of the same function with new code. This simplifies repeatable designs, consistency between machines and is especially helpful for remote servicing after installation.

Packaging Machine Design Efficiency

Critical functions like rotary knife, flying shear, registration control, and others are typically part of many packaging machines or their cohorts up and downstream. Utilizing a single automation vendor to bring the technologies together in a common programming language and toolkit for development and library management can make the design engineer's life much easier. Library management, and common tools for configuration and simulation can produce competitive designs on a repeatable basis, lowering the engineering costs to deploy over time.

Further, with advanced mechatronics and robotics being commonly adopted, engineers will utilize these same tools to tightly integrate these newer technologies directly into the same code base as the PLC with machine automation. Creating customized standards that can be saved as repeatable code blocks to control servos and robotics makes future design evolution easier. As robots become more commonplace in machine design, simulation and configuration combined with integrated motion and control programming can result in standardized, repeatable, rapid designs, easier troubleshooting and commissioning, and better accountability from suppliers.

Pak/iQ from Mitsubishi Electric provides many proven design functions pre-configured for repeatability and consistency.

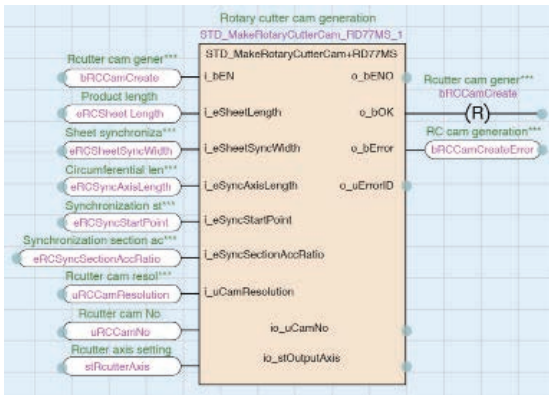


Typical of this concept is the Pak/iQ library as part of the iQ Monozukuri solution. Utilizing years of experience in positioning systems and a complete automation portfolio, common applications are provided as part of the more comprehensive software toolkits in the Mitsubishi Electric Software Library.

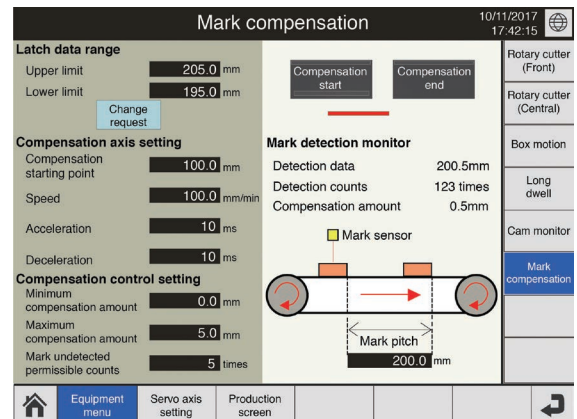
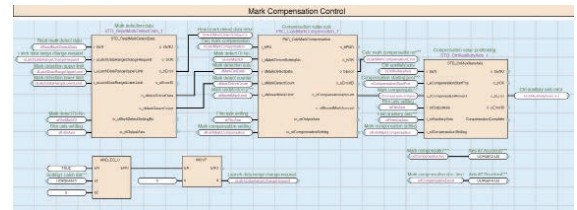
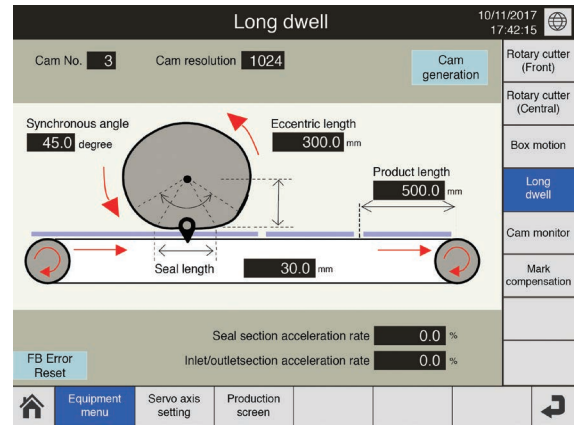
The iQ Monozukuri offerings are deployed as packages consisting of pre-engineered application solutions accompanied by technical documentation. iQ Monozukuri packages significantly reduce development and deployment times of industrial automation solutions allowing customers to bring products to market faster, and with greater consistency and efficiency.

The Pak/iQ library supports 70-80% of packaging applications by using pre-configured function blocks for PLC, Servo and HMI code from iQ-Monozukuri such as:

- Flying shear function blocks for wrapping machines
- Mark compensation function blocks for labelling machines
- Mark compensation/flying shear function blocks for form fill and seal machines
- Rotary cutter function blocks for rotary knife



- Mark compensation function blocks and CAM profiles for high-speed feeders



Simplifying cam profiling, position compensation, operating screens, and reducing development time utilizing preconfigured HMIs, function blocks, and auto-generation of code provide structured programming and repeatability for advanced designs and easier maintenance after commissioning.

Combining Simulation and Configuration

iQ Works is a comprehensive software suite that enables intuitive programming and setup of any Mitsubishi Electric system, including network configuration, PLC programming, motion controller and servo setup, GOT screen design, and robot configuration. Simulators and label sharing are also integrated to simplify cross-discipline engineering and troubleshooting. The highly graphical and fully customizable workspace provides a user-friendly interface with full visibility and control over the entire system. A complete suite of preconfigured applications, integrated with a common programming environment for robotics and controls provides machine designers with the tools they need to reduce development time and cost, reduce overall lifetime costs for their customers, and provide future proof designs built to grow with the Mitsubishi Electric portfolio.

The OEM Opportunity

OEMs, particularly in the competitive packaging machinery markets, are constantly advancing mechatronic and robotics utilization. The complexity of design and revisions to designs requires efficient library management and a minimization of tools used for design. As much as possible, reliable code base for repetitive functions are needed to minimize variations in designs and improve overall delivery response. Utilizing common program, configuration and simulation software with pre-configured performance functions provides faster time to market and lower engineering costs while providing single source accountability from the automation supplier.



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