



# Consider Motion Modernization

Discover how the benefits of modernizing outweigh the costs.

# Introduction

Modernization can seem like an overwhelming initiative. Perhaps you are considering modernization because you have been notified that products you have used in the past are becoming obsolete. Perhaps you are looking for ways to improve production or you would like to future proof a machine by leveraging the latest smart technologies.

Consider the use case where during operation, material jams a machine. With legacy safety systems, in many instances, an operator would be required to quickly stop production, perform a lockout/tagout procedure, clear the jam, and then restart the machine. Did you know that with safe monitoring solutions, that are available as part of a modern motion solution, the machine could potentially be brought to a safe operating stop and allow access to the machine without having to perform a lockout/tagout? Imagine the production time saved by eliminating the need to fully power down a system.

This paper sheds light on some of the benefits of modernizing a motion system.

## Consider Modernization

### Today's Automation Challenges



The temptation is to rip and replace the components in the system with modern equivalents, but is that really what is required? Why not take the opportunity to modernize the system and add the capabilities and features that you've wished were present over the life of the machine? Have a discussion with the machine operators and ask for their valuable and insightful input. Ask your production team about throughput bottlenecks and involve the maintenance staff, as well. Take a moment to stop and ask yourself what you are trying to accomplish.

Advancements in modern technology have enabled operators to complete tasks that may have been impossible when the existing machine was built. Advancements in human and machine safety include monitoring technology that now allows operators to be closer to the machine without fixed guarding in many cases, pending a proper safety risk assessment. Many tasks can now be accomplished without time consuming lock out and tag out procedures, or even without stopping the machine or line in many cases.

Similar technology advancements have made motion control systems capable of self-calibration (tuning) to meet the constantly changing demands of modern production. Gone are the days of requiring a technician to retune a system based on the product running on the line. Today's motion control products can adapt on the fly. The demand for increasing numbers of SKUs requires faster turnaround time and more machine flexibility; manufacturers must run smaller batches and often change recipes or format. "One-button changeover" is now possible on machines that run many sizes of products. Today's solutions utilize advanced technology like robotics, Independent Cart Technology (ICT), and analytics to design and to deploy these flexible solutions. Complicated, hours-long setup procedures can be eliminated by applying recipe-managed automation to these setup fixtures. The operator chooses the product and within a few seconds, all the fixtures are commanded to the appropriate positions required to accommodate the new product or material.

# Finding the Balance Between Capability & Cost



Let's face it; some systems are very complex, but some are quite simple. Rockwell Automation understands this. Our Kinetix® motion systems include simple, stand-alone programmable solutions in addition to our integrated motion portfolio to address your needs. All these solutions leverage the power of unmodified EtherNet/IP, so runtime data, security, analytics, diagnostics, and information are readily available to suit your needs.

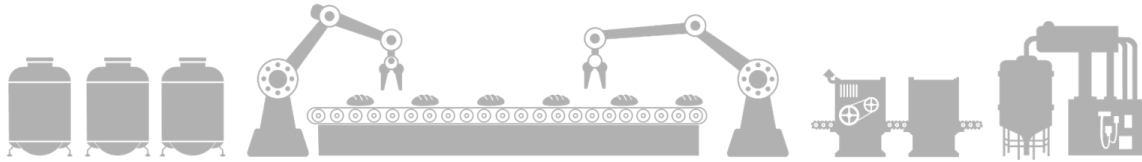
When it comes time to install your new motion control system, Rockwell Automation has simplicity in mind. Our Kinetix drive solutions offer zero-stack spacing to minimize panel size requirements. Many of our drives offer power bus-sharing to eliminate the need to install branch fusing for each individual drive and to allow the drives to balance and share DC bus power. Additionally, many of our modern motion control solutions support a single-cable solution that eliminates the need to install separate power, feedback, and brake cables. And most of all, Kinetix drives offer both hardwired and network-based safety solution options. Consider the time and hardware savings offered by eliminating the need to hardwire your safety devices with a network-based solution.

Of course, the size and complexity of the machine is best addressed with a fully integrated motion solution. Our Logix integrated motion solution allows you to synchronize and coordinate the movements of the machine programmatically. Imagine the freedom of not having to rely on fixed mechanical gears, belts and cams and replacing them with flexible electronic relationships! One common, industry accepted programming environment is all you need to configure, commission and program these solutions.

Finally, in terms of energy savings, Kinetix drives support AC line regeneration back to your power grid. Where your current solution may leverage braking resistors that dissipate excess rotor energy as heat, this modern solution allows you to capture that regenerative energy and return it to the line. Rockwell Automation has a Kinetix motion solution that fits your needs.

## Smarter Machines

Modern technology is often designed to take the hassle out of our lives. Automobiles can turn on our headlights for us at dusk. Mobile devices can remind us of important events and even provide the navigation to get there on time. Modern motion control systems also provide features that take the hassle out of production. Kinetix drives with Load Observer provide real-time tuning technology to automatically tune each axis, compensate for unknown mechanics and adjust for applications with varying inertia during operation. And Adaptive Tuning automatically configures filters during runtime to mitigate annoying (and sometimes destructive) machine resonances. The Virtual Torque Sensor technology can detect anomalies (like product binding or jamming) and provide analytics that help prevent unplanned downtime.



A Kinetix motion solution also offers many motor and actuator options to fit your application. From compact, economical servo motors for low-power applications to continuous-duty servo motors for high-power, high torque applications. We also offer many food-grade and hygienic-certified motors, as well. And our integrated actuator offering is designed to replace maintenance laden pneumatic and hydraulic systems with all-electric options while providing better control of acceleration and deceleration. Beyond the obvious energy savings, these electric actuators provide unrestricted programmatic positioning without moving stops, further supporting one-button changeover.

## Next Steps

The following table illustrates the scalability of Rockwell Automation’s servo drive offering to confirm you have the right drive for your application.

	Standalone Drives	Midrange Drives		Multi-Axis Drives
Machine Type	Simple Machines, typically Indexing	Simple Machines	Simple-Mid Sized Machines	Complex Machines
Axes Count	Low	Low-Medium	Medium	High
Safety Capability	Hardwired STO	Hardwired STO	Hardwired or Network STO	Hardwired or Network STO; Advanced Safe Monitoring
Integrated Motion on Ethernet/IP + Motion Instruction Library	X	✓	✓	✓
Tuningless Technology	X	✓	✓	✓
DC Bus-Sharing	X	X	✓ (non-regenerative only)	✓ (regenerative + non-regenerative)

With all of this in mind, we hope that you will consider a partnership with Rockwell Automation on your modernization journey. Rockwell Automation has the product and application expertise to bring your systems to best-in-class performance. End users will enjoy a quick return to production and smarter, more productive machines. Machine builders will be able to produce more machines, using the latest features, more efficiently while maintaining the same staffing. Modernization can be a great thing with the right partner and the right solution.



# Resources

Explore the following resources for further information:

[Rockwell Automation Motion Control Webpage](#)

[Step Forward to Motion Modernization Whitepaper](#)

[Technical Documentation Center](#)

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