

# Unlocking next-level packaging line flexibility through factory automation

**Consumer packaged goods operations can always count on one thing: their packaging lines will need to adapt to constant change. Few industries are subject to so much variability during production – with ever-changing consumer trends, products, portion sizes and package designs that can impact the entire manufacturing process.**

The rate of change is also accelerating. Consumer behaviors are rapidly shifting by way of the internet, and demand for options like sustainable packaging or personalized labels adds new pressure on brands to innovate the way they package their products. At the packaging line, this means operations need maximum flexibility to keep ahead.

As the industry's needs change and evolve, so too do the technologies available to CPG operations. Adapting to technological change always comes with challenges, but it can make all the difference between success and being left behind. In this paper, we'll look at the many ways packaging lines can improve their flexibility and productivity through four key factory automation technologies.

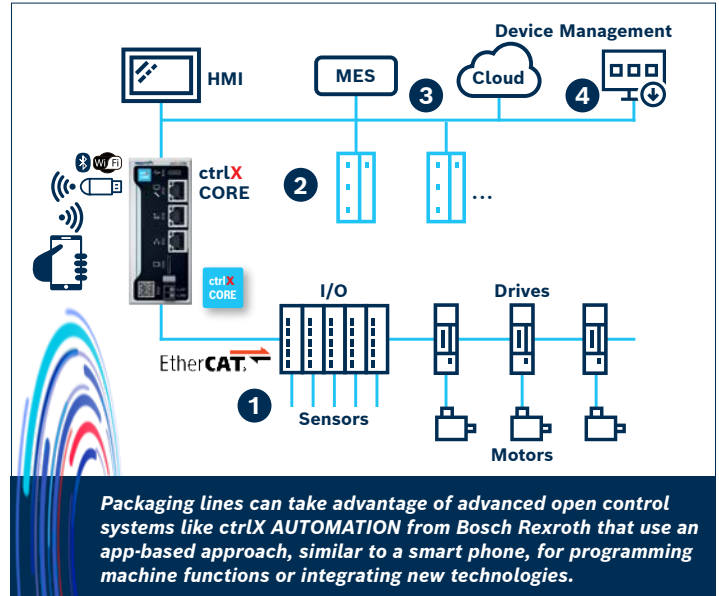


Packaging lines today need more ways to adapt quickly to ever-changing conditions – all while meeting increasing pressure for productivity and line efficiency.

## STREAMLINE ENGINEERING WITH OPEN CONTROLS

A long-standing criticism of automation engineering is how time-consuming it can be, especially when launching whole new production lines. Long intervals from initial design to

first production runs do not align with the timelines that packaging lines face today.



That critique is a valid one for many conventional automation platforms. Machine hardware that isn't modular, that's bulky and that's bound to closed automation control architectures, can pose serious hurdles to implementation. Without an open control system, operations need to rely on specialized engineering resources and esoteric programming languages to automate a system. These proprietary, closed systems also create interoperability challenges when trying to replace old equipment and integrate new technologies.

With the latest advances in automation controls from Bosch Rexroth, ctrlX AUTOMATION gives packaging lines access to an open architecture with far more flexibility to meet ever-changing requirements. Using an app-based approach to automation, similar to a smart phone, ctrlX AUTOMATION dramatically streamlines programming machine functions or integrating new technologies.



Production facilities and machine builders can choose apps from Bosch Rexroth or third-party suppliers, or they can create their own apps for functions tailored specifically for packaging applications. This makes it far easier to navigate accelerating technological change, because now packaging automation programmers can use coding they already know to implement new technologies of today and tomorrow, whether it's for a new machine, virtual reality, IoT or advanced cybersecurity.

Using this approach to automation also opens up a new world of possibilities for process transparency, product tracking and predictive maintenance. With the open ecosystem of ctrlX AUTOMATION, operations can more easily integrate machines and other technology into a complete system that offers unprecedented connectivity. That means almost any piece of equipment can also operate as an edge device, collecting data on processes and production flows to optimize efficiency.

## GO WITH MODULAR, CONNECTED CONVEYORS AND TRANSPORT

Conveying systems used to be one of the last considerations when designing and equipping a packaging line. But today, transport technology is more connected and more modular than ever before, making it one of the easiest ways to achieve an agile packaging operation.

Take for instance Bosch Rexroth's modular plastic chain conveyor system, VarioFlow plus. With a streamlined design consisting mainly of plastic and configurable aluminum or steel components, this transport system is designed to maximize flexibility and optimize production flow in

any type of manufacturing footprint. The only limit to a conveyor system design with this technology is the limit to an engineer's imagination. Unlike stainless steel conveyor systems, which are welded, plastic chain conveyors can be quickly reconfigured and modified to meet rapidly changing requirements. VarioFlow plus also satisfies several other key industry trends, such as larger and heavier packages, increased reliability and uptime through more reliable belts, chains and gearboxes and the ability to easily incorporate Industry 4.0 capabilities such as sensors into existing conveyor systems.

Another transport technology to consider for added flexibility in packaging operations is the linear transfer system ActiveMover. Food packaging lines that must contend with high volumes or custom packaging scenarios require high speed and high positioning accuracy. The linear motor-driven carrier ActiveMover provides extremely fast transport with precise positioning accuracy while moving workpiece pallets independently of one another. These systems can run autonomously, and their machine functions can easily be adjusted through simple programming.

ActiveMover transfer systems also offer built-in connectivity, with visual displays that monitor power consumption, lubrication and temperature and can even enable virtual simulations that help you find optimal throughput and carrier use. By factoring connectivity into a transfer solution, operations can ensure they're tooling their packaging operation for the future.



*Modular plastic chain conveyor systems like Bosch Rexroth's VarioFlow plus offer packaging lines maximum flexibility with reconfigurable systems that can be quickly adjusted to any type of footprint.*

## GET TO MARKET FASTER WITH SMARTER MECHATRONICS

When it comes to automating applications like package sealing, embossing, forming or pick-and-place operations, CPG operations need new ways to streamline engineering and deploy solutions faster. Bosch Rexroth's Smart MechatroniX solutions platform builds upon the latest advances in mechatronic control, hardware and software to offer intelligent, connected systems that are ready to use "out of the box." Used widely in other applications, ranging from product assembly to single- and multi-axis Cartesian-style robots for material handling, this new approach to automation is also particularly well suited for packaging end-of-line functions.



*Our cross-technology portfolio for EV manufacturing features best-in-class products combined with leading technology to drive higher machine value, streamline operations and ensure seamless integration.*

A highly configurable solution like Smart MechatroniX can help operations achieve quicker time to market by simplifying the engineering tasks for systems that need new processes or functionality for ever-changing requirements. These next-level mechatronics also support transparent production processes, with features that automatically capture process data and enable real-time condition monitoring and predictive maintenance.

## TAKE ADVANTAGE OF MORE VERSATILE AMRS AND COBOTS

Robotics play an increasingly important role in packaging environments. As systems become sophisticated enough to handle a wider range of tasks, they can provide the flexibility operations need to address labor force shortages. Technologies like autonomous mobile robots (AMRs) have a big role to play in improving efficiency and safety in warehouse automation. They can also improve flexibility in systemwide processes when they're all connected to a single control system that can use data from the entire production floor to respond to disruptions or optimize flows.

However, not all robots are created equal. Packaging lines that require maximum flexibility need AMRs that can handle a variety of payloads and can operate in a variety of spaces and changing production floors. Bosch Rexroth's AMR portfolio can meet these requirements, with capacity to handle payloads up to 1,000 kilograms and 360-degree obstacle detection. They can also interface with other equipment like conveyor systems or collaborative robots (cobots).

The Kassow Cobot from Bosch Rexroth can also offer a highly flexible solution for applications like picking and placing, box forming or palletizing. They can easily adjust to varying package sizes without any adjustments to hardware. And a unique 7-axis system improves reach, giving operations more options of where to position the robot on the packaging line.

But most importantly, Bosch Rexroth makes it increasingly easy to program new machine functions in today's robots. With an open technology ecosystem like ctrlX AUTOMATION that uses an app-based approach to controls, engineers can easily change robot functions as needed using a simple drag-and-drop app downloaded from a server. This allows operations to use robots for a variety of tasks, switching between functions on any given day with minimal programming.



*Linear transfer systems like Bosch Rexroth's ActiveMover offer food packaging lines extremely fast transport with precise positioning that can be easily adjusted with simple programming.*

## **CHOOSE A TECHNOLOGY PARTNER WHO'S IN IT FOR THE LONG HAUL**

Although it's important for packaging operations to have the flexibility to work with multiple technology providers, choosing a partner that offers a complete automation portfolio with an app-driven software architecture, open interfaces and scalable hardware options can provide the greatest value.

Working with Bosch Rexroth gives CPG manufacturers access to a complete automation portfolio that makes problem-solving far more flexible and effective. With an

offering of multiple technologies for every stage in the packaging process, it's far easier to make integrated technologies work together seamlessly to improve productivity from beginning to end.

Bosch Rexroth's complete automation offering extends well beyond the technology. Behind every solution is decades of application expertise, and Bosch Rexroth supports operations for the long haul with full lifecycle engineering support and expert service. Working with a partner like Bosch Rexroth, that's fully invested in complete automation for your industry, will help ensure transformative results for your packaging line's success.

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