

# Modular efficiency – Integrated performance



GEA's PowerPak NT is a high capacity form-fill-seal machine that delivers outstanding investment protection and process reliability. Thanks to B&R technology, it is also exceptionally easy to integrate in a line.



"Particularly when it comes to bringing machines together to form a line, our B&R solutions are still bringing us significant savings," says Stefan Krakow, head of product management and sales support at GEA Food Solutions Germany GmbH. Among its many products, the company develops and produces thermoformers for the food and pharmaceutical industries. "In one recent example, our close cooperation with a well-known sliced cheese producer from the Netherlands yielded six-digit savings."

#### Process data pays dividends

These immense savings were preceded by a detailed analysis of the timing of processes in the production line responsible for slicing

and packaging the cheese. "In addition to a few mechanical modifications, the challenge here was a matter of shaving off a few tenths of a second to achieve the desired performance," explains Rolf Rein. Rein leads the software and electrical development teams at GEA's Biedenkopf location and was around back when GEA (at the time called CFS) switched to B&R control technology. "These differences aren't visible to the naked eye, so we needed data to come directly from the machine with the necessary temporal resolution. B&R controllers do just that. They provide high-speed access to all types of process data recorded at millisecond intervals, which they are equipped to handle internally."

The analysis of this data indicated that one of the machines in the cheese production line was waiting for the "Done" signal from the preceding machine before it started. Doing so resulted in an unnecessary delay of several tenths of a second. The solution? The timing of the signal is now advanced to ensure a seamless transition between the processes with no delay. What may seem at first glance to be a mundane optimization meant a four percent boost in output for this cheese manufacturer, which adds up to several hundred thousand euros per year.

#### On-the-fly optimization

Thanks to B&R's fully integrated automation solution, machines from GEA Food

Many machine builders share a common dream. They dream of a day when they can react to their customers' requests with absolute flexibility, with a diverse range of machine solutions that is nevertheless built from a consistent set of hardware and managed in a single software project. Not GEA Food Solutions. For GEA, that day came more than ten years ago – with an automation solution from B&R. Since then, this supplier of secondary food processing and packaging equipment has been quick to market with efficient solutions – from standalone machines to complete processing lines – all with minimal engineering effort.

Solutions are capable of much more. Finely tuned, intelligent communication between machines allows operators to optimize the system in real time – for example, by switching out cam profiles on the fly. When replacing cheese blocks creates a gap in production that can't be compensated by a buffer, the packaging machine simply adjusts its speed accordingly. This prevents empty packages, which in extreme cases threaten to bring down the whole line.

With B&R's uniform HMI design, operators can easily master a single, highly intuitive operating philosophy and are able to react more quickly to errors. From any given GEA machine, operators are able to not only monitor, but also operate, every GEA machine in the line.

To empower its customers with the means to objectively measure and optimize the productivity of their systems, GEA offers various tools – such as GEA CostFox – built around the wealth of data provided by its B&R controllers. The operator uses this software tool to perform an on-site performance analysis in real time to obtain key quality data. This is made possible by GEA's across-the-board B&R solution – from motion and I/O to control and HMI – that ensures seamless communication without the system disruptions that otherwise hinder comprehensive analysis.

In the cases where the user does require outside assistance, B&R controllers offer remote maintenance options that make

the process remarkably painless. "Remote machine communication has proven extremely helpful in practice," says Rein. "Using the diagnostic options provided by B&R controllers, our technicians are able to perform a detailed line analysis right from our local offices."

#### Easy-to-use software for both developers and users

Between the highly reliable hardware and the easy-to-use software, however, outside help is rarely required. "Intuitive operation is a key requirement not only for HMI design, but for the engineering environment as well," stresses Rein. "After all, we don't just use the tool to plan and develop the automation architecture, but also to commission and service the machines and lines on-site, so we need it to accommodate users with very diverse backgrounds."

Rein values the careful attention to ergonomic design that clearly went into the development of B&R's Automation Studio engineering environment. As a particularly key benefit he points out the high degree of integration: "This makes a noticeable difference in the amount of time and effort spent on engineering. Having a single environment where you create the entire software solution, including motion control and HMI, makes things easier for both developers and users."

GEA has taken particular advantage of Automation Studio's ability to design control software that mirrors the modular structure



GEA Food Solutions used Automation Studio to create a uniform HMI application for all of its machines.

Stefan Krakow

Head of Product Management & Sales Support,  
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of the machines themselves. "This is particularly convenient for commissioning engineers, helping them quickly find their way around even complex systems such as thermoformers," says Rein. "The individual modules are also highly encapsulated with well-defined software interfaces, so it's safe to change the code of one module without worrying about any negative impact on others."

#### A single software platform for all machines

The real secret of GEA's solution is that all of the company's thermoformers share a common software platform. When they put together a new machine for a customer, all that's left to do is adapt the configuration to match the layout. For GEA, the tedious task of reworking the software for each new machine is nothing more than a faint memory. This is one of the main ways that GEA is able to keep such tight reins on its engineering costs. "This is especially important to us since thermoforming is a very price-sensitive market with very stiff competition," says Krakow.

The customer not only profits considerably from the performance of the B&R hardware, but also from the sophisticated software architecture that GEA developed in close cooperation with B&R's expert developers.

"All application data is stored on a standard CompactFlash card. During commissioning and maintenance, there's no need to load the software onto the controller or any other components since they all draw their data from the central CompactFlash card. Hardware is changed out quickly and easily without having to call in an expert." The openness of B&R hardware and software also makes it extraordinarily easy to integrate third-party equipment. "B&R's commitment to open standards for both hardware and software, as well as the full-featured software library, provides optimal support when networking machines from different manufacturers," says Rein.

#### Simulation accelerates engineering

Further benefits of B&R's openness can be found in other areas. Integrated interfaces for MATLAB and Simulink allow complex motion algorithms to be easily developed and simulated. GEA's future plans involve more than simply increased use of this efficient approach to engineering. "We will also be using the interfaces between Automation Studio and E-Plan to prevent transcription errors and eliminate the need to make redundant entries in two different development systems," concludes the GEA software and control expert. ←



An industrial PC from B&R's Automation PC 910 series offers enough computational capacity to integrate all of the software for machine and motion control in a single device.



Using Automation Studio, GEA Food Solutions established a standardized software solution for all of its machines so that each customer's particular arrangement of machines requires nothing more than simple configuration. Since then, the company has all but forgotten what it's like to have to tediously rework the software for each new machine. B&R's engineering environment is built around open standards and provides extensive software libraries – allowing GEA to integrate in-house and externally developed machines as though they were old friends.