

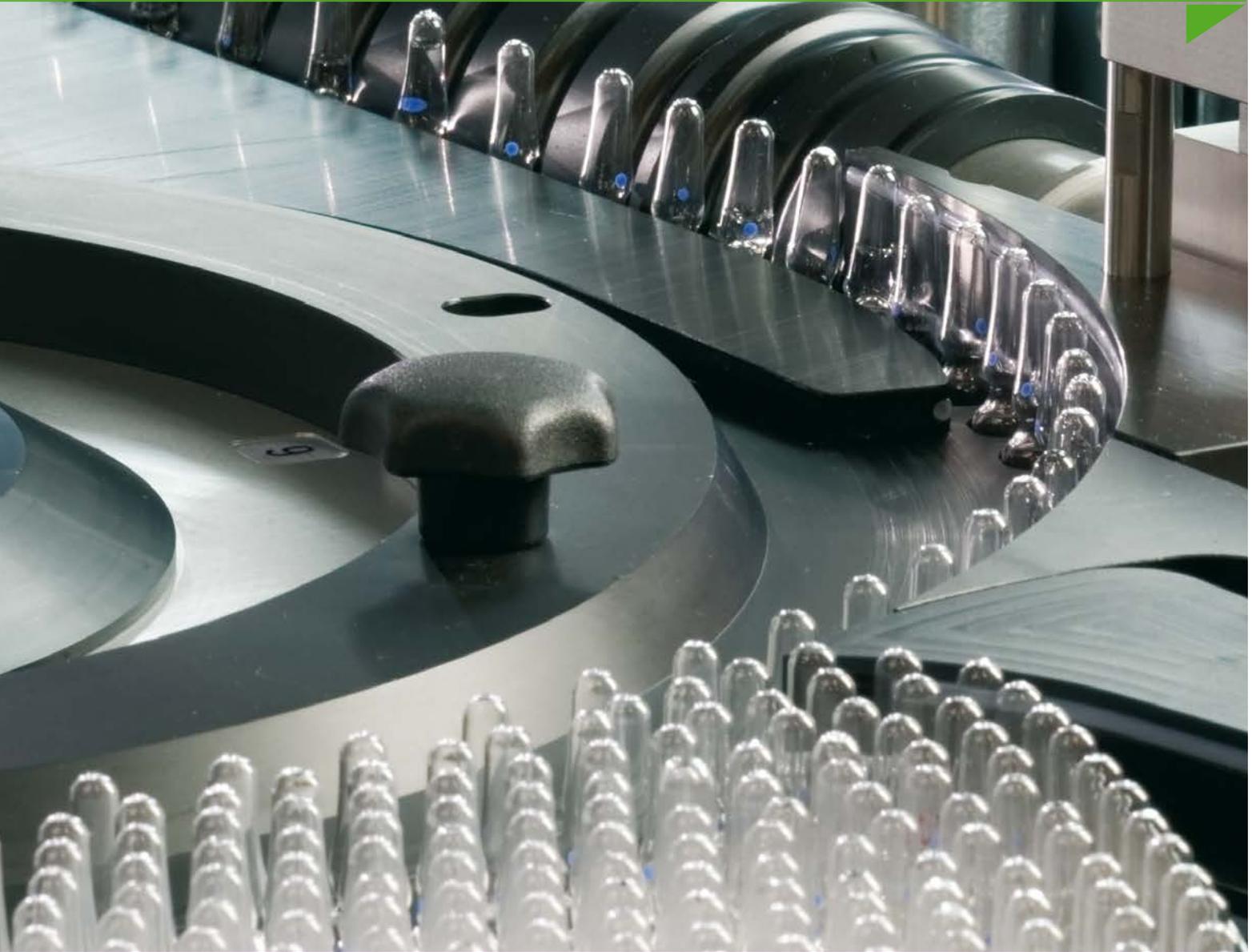
Modularity: The lead time killer



"Until very recently, we faced the same mountain of programming that many OEMs face when building and commissioning a new machine," says Herbert Grindinger, head of Seidenader's PLC programming department. "With our new series of CS inspection machines, we've finally leveled this mountain." For Seidenader this means a drastic reduction in lead times throughout production, commissioning and maintenance of its inspection machines for liquid and freeze-dried medication and nutrition provided in the form of infusions or injections – known as "parenterals". For the programmers, it means being able to focus on enhancing machine performance

and adding new features. Switching to integrated automation from B&R was the first step toward these achievements. Seidenader now works with a single software project that covers the entire inspection machine, including every piece of optional equipment. "For us, this turns the creation of custom control software into a simple matter of configuration rather than tedious programming," explains Seidenader's controls expert. "And the best part is that, with B&R, this also includes the safety solution." This elevated degree of modularization and standardization allows Seidenader to produce and test its machine modules in advance.

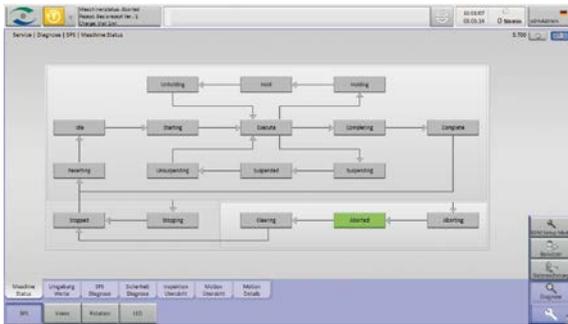
Virtually none. That's how much time is spent on programming during the construction and commissioning of a CS-series inspection machine from Seidenader. The secret is the exceptional modularity of both the machine and its automation architecture. For Seidenader's customers in the pharmaceutical industry, this means spending more time in productive operation and less on qualification and maintenance. Did we mention the machines are also more flexible? Behind all of these advancements, you'll find a uniquely integrated automation solution from B&R that facilitates a modular machine design along every step of the way.



A new level of functional safety

The end user has plenty to gain from this new machine design as well. Since the software has already undergone thorough testing on a fully operational machine and didn't have to be tweaked and adapted throughout construction and commissioning, it provides an unprecedented level of functional safety. When it comes time to add or replace modules down the road, the comprehensive standardization makes this much faster and easier as well. "If the requirements change and you need to swap out the infeed/outfeed unit, it's no problem at all – you just enable or disable the

respective software modules and the rest of the code remains untouched," explains Grindinger. "This greatly simplifies the task of system qualification for the end user." Machine operators are supported at every step along the way by B&R's commitment to completely integrated automation. The new solution makes it easy for them to generate a complete list of components that can simply be checked off during qualification. Grindinger's team found B&R's engineering environment very helpful when it came time to create the machine's control software. "What we really like about Automation Studio is that it doesn't place any restrictions on the user



Seidenader uses PackML as an internal standard applied universally by all programmers, which makes the software easier to understand, diagnose and operate.

The IP65 rating of decentralized ACOPOSremote drive components allows them to be mounted directly on the machine without an additional control cabinet. Power runs through a single hybrid cable carrying both the POWERLINK and STO signals in addition to the 24 V supply. By using this standardized technology as the electrical interface between the various modules that make up its new CS-series inspection machines, Seidenader has taken its modular solution to a whole new level.

with regard to selecting a programming language,” explains PLC developer Michael Grampp. “We went with Structured Text, for which B&R offers comprehensive and powerful libraries. The added support for pointers helped us manage the large volumes of data that come with modularization.”

Transparency and user-friendliness thanks to PackML

B&R’s support for PackML further added to the system’s transparency. “We’ve implemented PackML as an internal standard that everyone must adhere to,” says Grindinger. “It’s not something we impose superficially just for the HMI benefits – we’ve broken it down to the level of each individual machine module. This makes the software more transparent and easier to use and maintain. Beyond that, it also simplifies the tasks of line integration and communicating with higher level systems.” Another significant advantage of B&R’s engineering environment is that it allows machine control and motion control to be handled on a single hardware platform. “The fact that we no longer need two separate platforms substantially simplifies programming,” adds Grindinger. A powerful industrial PC from B&R’s Automation PC 910 series handles the control aspects of the new CS machine. It is mounted in the main control cabinet on the central machine module along with up to five image processing PCs, which ensure that the CS is able to detect a wide array of contaminants and optical defects. The machine is suited for ampules, cartridges and vials up to 100 ml, covering a broad spectrum of product and container formats. To complement visual inspection, it is also possible to integrate

modules for headspace gas analysis (HSA), near-infrared spectroscopy (NIR), polarimetric inspection (GSI) and high-voltage leak detection (HVLD).

Software cam switch for added triggering flexibility

“When you use cameras for visual inspection, the way that they are triggered has a direct impact on the quality of the results,” says Grindinger. In the past, the company had to use a separate electronic cam sequencer, which only permitted position-based triggering. This also meant that a new recipe had to be created in advance for each new profile, or the cam switch software had to be modified, retested and requalified. “B&R offered a better solution,” explains Grindinger. “The X20DS4389 module from their X20 series provides digital outputs that use the AsMcDcs library to allow triggering based on timestamps. Used in conjunction with a position-based trigger, this makes it possible to maintain consistent timing and achieve optimal inspection results – regardless of how fast the inspection carousel passes the containers in front of the camera and rotates them with the aid of small servo motors.” Not only does the CS no longer require a separate cam switch, it also allows the same software to handle a whole range of speeds simply by tuning recipe parameters – so there is also no need for requalification. Operators set these parameter values in the same way they interact with every standard and optional module in the machine – using a custom Panel PC 820 HMI with an 18.5" display in 16:9 format, which communicates with the Automation PC 910 control computer via Ethernet.



In developing its new CS series of inspection machines, Seidenader took advantage of B&R's commitment to fully integrated automation to drastically reduce lead times for its custom-built machines through improved modularity.

Standardized electrical interface between modules

Seidenader selected POWERLINK to network the up to twenty ACOPOS drives used in its new inspection machine. Between machine modules, a single standardized hybrid cable provides the power supply for the decentralized ACOPOSremote drives as well as two lines for the STO signal and POWERLINK. The corresponding remote connection boxes allow either a line or star topology. "The hybrid cable lets us take modularization to a whole new level," says Grindinger. "We now spend considerably less time and effort installing, commissioning and servicing the modules."

Integrated diagnostics for service technicians

Thanks to B&R's integrated automation solution, commissioning and maintenance were already pretty simple to begin with. "With the software for all of the automation components managed and distributed from the central control computer, installing or replacing a drive is child's play," confirms Grampp. "With B&R, there's no need to use a separate programming device or pre-install any software." No extra equipment is needed to perform diagnostics on the automation system, either. The diagnostic functions B&R provides, such as System Diagnostics Manager, can be called up directly on the HMI. Seidenader programmed all of the other tools needed for analysis directly into its HMI application. Grindinger has big plans for the system's yet untapped potential. "B&R's solution gives us so much capacity for growth, I expect we'll soon be able to push the specified output for the new CS series even higher than the current 400 containers per hour. We also designed the

machines and the automation architecture in a way that allows us to easily scale the solution across our entire range of products, including our most powerful inspection machine. With B&R, we're confident that we have the right partner for the job."

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Herbert Grindinger

PLC Programming Manager, Seidenader Maschinenbau GmbH

"We now work with a single software project, created in Automation Studio, that covers the entire CS-series inspection machine, including every piece of optional equipment. A new machine is a simple matter of setting parameters rather than tediously redeveloping code. And the best part is that, with B&R, this also includes the safety solution."