

Process visualization with zenon

SIG makes the operation of complex filling lines more intuitive

Bringing intuitive operation to complex machines is the objective of many equipment manufacturers – especially in light of an increasing shortage of skilled workers. [SIG](#), one of the world's leading system and solution providers for aseptic packaging in the food industry, has succeeded in doing just this with its new operating concept for filling lines. The company has worked with COPA-DATA to develop a new design for its HMI.



In the food industry, highly complex machines are used every day to pack millions of packages of food safely and efficiently. This ensures shelf-stable products packed under sterile conditions to the highest standards of hygiene. The Swiss system and solutions provider SIG is a leading manufacturer of innovative food packaging and high-tech systems for the aseptic filling of liquid food products. The company has been using the zenon software platform for the control, visualization and security of its machines since 2007. The company places great value in its ability to easily expand the software and the freedom provided by zenon's graphical design capabilities. Other critical factors include the connectivity with other systems and the easy transfer of extensive process data. The systems are controlled via a Codesys-compatible PLC that

interacts with several other components connected mostly via a bus system. These include, for example, ultrasonic welding technology and additional servo motors and smart sensors. Due to the large number of complex processes implemented using C# add-ins, SIG relies on zenon for control and visualization.

THE LATEST FILLING TECHNOLOGY

With [SIG-NEO](#), SIG has developed the next generation of innovative filling technology to provide even more efficiency, productivity and sustainability in the food industry. The solution is focused on maximum usability with full attention to the needs of the user. "From detailed discussions with our customers, we know that ease of use and intuitive operation are top priorities for our customers," explains Stefan Mergel,

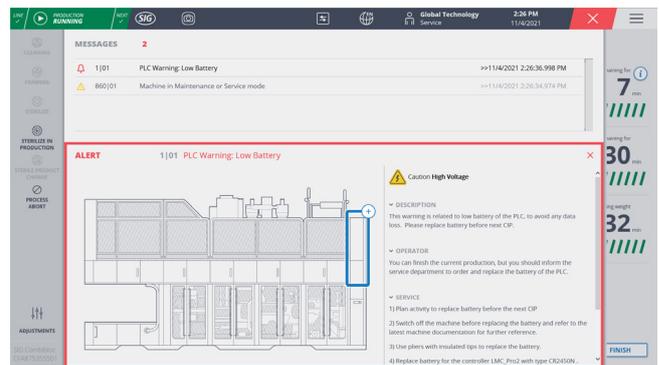


The SIG NEO dashboard displays all the relevant information for HMI operators in a clear and intuitive manner.

Senior Product Manager at SIG. The increasing shortage of skilled workers and the high cost of training on equipment are major considerations. The challenge was to visualize highly complex technical processes in such a way that operators could run them without error after only a short period of training. At the same time, the equipment increasingly has to be flexible. In addition to different products and recipes, the machines have to cover the widest variety of different packaging sizes and designs, limited editions and seasonal specials – in just a few steps or via easy, self-explanatory clicks on the display.

HMI: THE HEART OF LINE CONTROL

To meet these requirements, the equipment manufacturer designed a completely new line-operating concept through a development process over several years. As the central interface between human and machine, the HMI is key to improving user-friendliness. The company has, therefore, reimagined the zenon-based HMI and made a consistent effort to focus on users. A critical factor behind the company's choice of the COPA-DATA software platform was its openness and flexibility. The result is a user interface that visualizes all the relevant processes clearly and, at a glance, displays all functions and options required by different user groups in a structured manner. It guides the operator through challenging application processes in an easily understandable way. In addition, the state-of-the-art interface creates a distinctive user experience. The user interface is based on the design standards of modern websites or smartphones and sets a new standard for industrial systems (Design partner: [HMI Project GmbH](#)). So far, most have paid little attention to these aspects or are unable to do so due to the software in use. The new standard includes, for example, the integration of shadows for more depth of view, the highlighting of clickable buttons, and the development and integration of state-of-the-art, informative icons and graphics.



Operators are notified in a timely and obvious manner about operationally relevant actions, such as changing batteries.

Additionally, the design extends to all elements of the line for the first time, which, in addition to a consistent, uniform look and feel, introduces important enhancements in process reliability, usability and standardized reporting.

KEEP THE VARIETY BUT STREAMLINE THE PROCESS

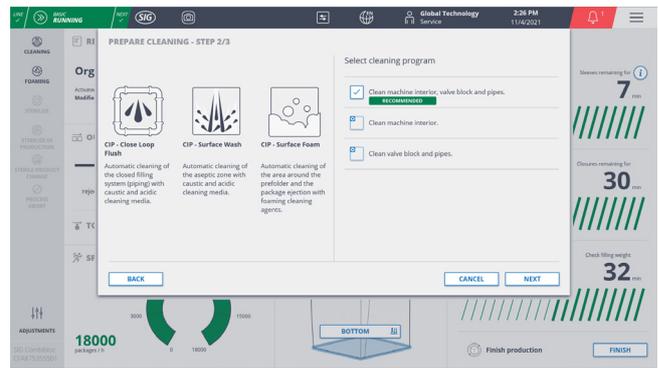
Another important element of the new bottling line concept is its versatility. Customers can fill different products or recipes with little effort. Packaging formats and sizes can vary. It is also possible to change the design, special packaging, bundles or trays. For this reason, SIG uses zenon to provide a simple and user-friendly visual implementation. In the zenon Recipe Group Manager, different variants can be stored with all the details, such as speeds, temperatures, pressure, quantities or packaging sizes. "The Recipe Group Manager is an important module that helps us flexibly and clearly map the variety of options supported by SIG NEO," explains Michael Schaaf, Team Leader HMI & Transformation Engineering at SIG. The recipes are either preset there or can be defined by trained experts on site and changed at any time. Users can select from processes defined in the Recipe Group Manager in a reliable and intuitive manner.

WORKING TOGETHER FOR OPTIMAL RESULTS

SIG has been working with COPA-DATA for approximately 15 years. This is one key reason SIG reviewed the feasibility of utilizing zenon services early on in the project development phase. "With our new operating concept, we are fully exploiting the possibilities of zenon for the first time. The result is an operating concept that sets a new standard in the food industry," explains Michael Schaaf. "To achieve this, we chose to use COPA-DATA's specialized support." Product

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MICHAEL SCHAAF,
TEAM LEADER HMI & TRANSFORMATION
ENGINEERING BEI SIG.



SIG NEO has an automated cleaning feature. The HMI guides users intuitively through the process.

developers from COPA-DATA were closely involved with implementing the new design right from the start. They were able to actively apply their expertise to the design of buttons, informative icons, and the rollout of a complete library. The latter is an important prerequisite for the long-term success of the concept, because a well-planned and diversified library enables users to react to changes in the machine design quickly and at any time.

“Our collaboration with the COPA-DATA team has been a very constructive partnership,” states Michael Schaaf. “From day one, everyone was fully onboard with exploiting all the possibilities together with us. This hands-on attitude has carried us far in this project.”

In addition to a comprehensive range of options, the software platform provides a number of interfaces that enable users to incorporate their own add-ins. For example, SIG has developed an automated error message import instead of manually configuring messages in Engineering Studio. Due to the strict hygiene standards in the food industry and the complex processes required during production, there are sometimes over 4,000 different fault scenarios on a filling machine, and these are displayed on the interface in text and images. The automated integration via API is a great relief here and another important component of process security.

ROLL OUT FOR A MACHINE SERIES

Following the successful market launch of the new operating concept, SIG plans to adapt it over the long term for other systems’ and series’ production machines. Since zenon is already being used, it will also be possible to ensure compatibility with legacy SIG equipment. SIG has left the door open to implementing further automation and digitalization steps based on the technology used.

HIGHLIGHTS:

- ▶ Developing an intuitive operating concept for a highly complex system
- ▶ Reduced training time, even for unskilled users – thanks to extensive support and excellent usability
- ▶ Flexible use on different machines with varying requirements thanks to an extensive library and unparalleled system compatibility