

Role models for production



Functionality and good design do not have to be a contradiction, even when talking about HMI devices for industrial machines and systems. In fact, combining both aspects brings clear advantages for the operator as well as the supplier: less machine downtime, faster product changeovers and shorter training times for system operators in addition to clear branding and a high level of recognition for machine and system suppliers. The filling and packaging manufacturer KHS has taken advantage of this approach to design a state-of-the-art operator panel that has already pocketed a number of awards. Management at KHS have another reason to be happy, however. The customer-specific operator panel supplied as a complete system from B&R is more compact than its predecessor and no more expensive than a comparable standard solution.

"Until now, human machine interfaces were most often designed specifically for each individual machine, even if they were developed to be operated on a single line," explains Tammo Zorn, the assistant manager of advanced development at KHS GmbH. "In addition, it was usually the same engineers responsible for programming the machine sequences who designed the visualization application." This meant that the production line operator, for example on a beverage filling system, had to

be able to understand the many different HMI devices being used, but the requirements of the different employees operating the machine were not sufficiently taken into consideration.

This makes it necessary to have replacement parts on hand for all of the devices – from the smallest monochrome display with keys to the larger touch screen operator panels that might also have various switching modules. In addition, there is much more training involved and operators are not able to work at any machine in the system. Not only that, the different operating philosophies on the line make it difficult to correct errors or perform changeovers quickly.



Trend towards standardizing the HMI devices on the line

"System operators would definitely prefer simpler operation, standardized hardware and a uniform operating concept for all the machines on a line," explains Zorn. "The sheer amount of product output in the brewing or beverage industries, for example, makes these demands very clear. The trend towards an ever-increasing variety of drinks and the associated demand for short changeover times are the icing on the cake."

KHS – a renowned solutions provider of technologically advanced and innovative filling and packaging systems for the beverage and foodstuff industries – has gone on the offensive in this regard, as Zorn makes clear. "When it came time to develop our latest HMI generation, it was our top priority to develop a human machine interface that united outstanding design using the latest materials and technology with advanced functionality in order to create tangible advantages for line operators and, ultimately, for ourselves as well."

An operating concept underpinned by science

In this regard, the company blazed new trails, bringing external experts from the Fraunhofer Institute IAO as well as experienced industrial designers on



With an optimal combination of ergonomics, navigation and design, the KHS panel fulfills all requirements for intuitive operation.

board from the very start. "This resulted in an scientifically-based operating concept and a design loaded with unique features," Zorn says. For his team, the work was just getting started, however. After the basic design and concept had been established, it was time to start looking for the right hardware and software platforms to incorporate into it.

"We contacted B&R early in the game, but we also took the time to check out prototypes and solutions from other providers as well," explains Zorn. "At the end of the day, however, we had every reason to go with B&R." It wasn't just the solid reputation earned by the company in the area of customized HMI devices; it was also the quality of the solution they presented as well as their overall approach from the very beginning – highly professional and based on the principle of partnership. »

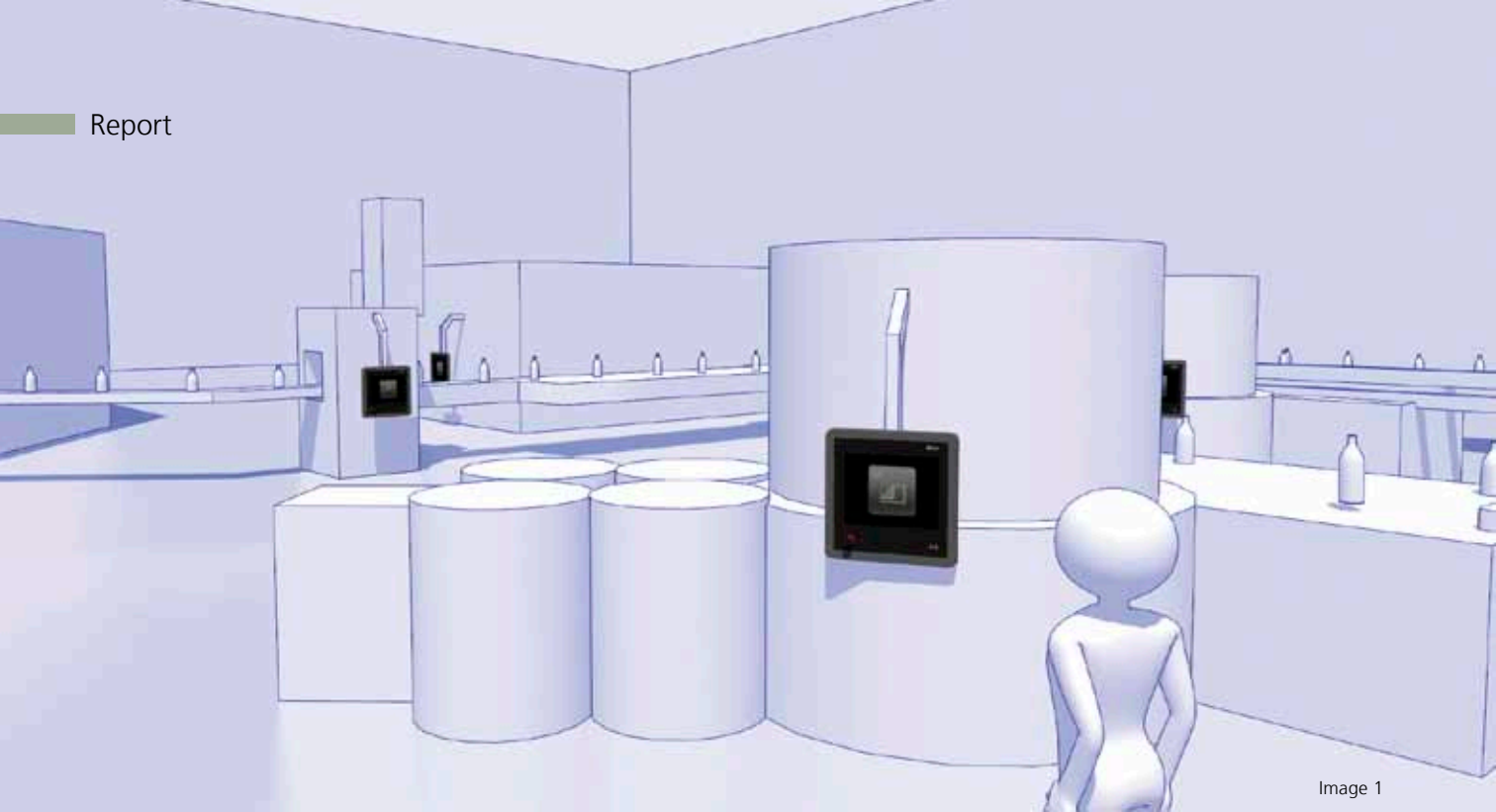


Image 1

Customized HMI as a complete package

It was this partnership that led to the implementation of an operator panel mounted on a support arm, which was supplied by B&R as a complete package including the panel, cables, and mounting fixture as well. This solution is currently being installed in all of KHS's machines, with plans to continue doing so for successive generations. The heart of the solution is a 15" Panel PC with touch screen and no rotating parts (such as fans or hard drives) from B&R's standard product range. Zenon software from the company COPA-DATA provides the basis for the visualization application. The fully aluminum housing meets the highest demands on hygiene and cleanliness – another of KHS's requirements that was met with no problems. With IP65 protection, it is dust-proof and provides complete protection against splashed and sprayed water. The front of the display includes three well-placed illuminated ring keys and an E-stop switch. It would be easy to miss the small symbol, also on the front of the device, that indicates another novel feature of the new KHS operator panel: an integrated RFID receiver, completely modified to meet KHS requirements, provides the company with another option for retrofitting.

Role-based use of the visualization application using RFID technology

"The use of wireless identification technology is a central element of our new operating philosophy," Zorn points out. User access protected by conventional passwords had become, according to Zorn's experience, a bit too lax and somewhat unsafe. "All too often, we would see passwords scrawled on

the inside of the control cabinet," he explains. "To avoid this, we now use an RFID card system so that personnel can log onto the machine – much like how employees clock in and out at many companies." The card includes information that identifies the user and his or her role in the production facility. "While preparing for the changeover, we took the time to think about who would be using a machine's HMI so that we could divide personnel up into targeted user groups," he explains further. "In addition to the personnel running the machines, there are, for example, filling line managers, lab



Image 2

Image 1: An integrated operating concept for the production line was developed in cooperation with B&R.

Image 2: The new KHS panel has won multiple design awards by placing the emphasis where it belongs – on the operator.