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ROUGH TIMES
FOCUS ON CHANGE: BOSCH STAYS ON COURSE

Hearing malfunctions
The SoundSee sensor system will make this a reality. And it is being tested on the ISS. ▶ Page 28

Rescuing people
The RescueWave smart solution provides a better overview in emergencies with multiple casualties. ▶ Page 32

Helping the homeless
Our associate Maria Jung rides a bus through Munich, passing out tea and sandwiches. ▶ Page 44

THE SMARTPHONE OF AUTOMATION

The new **ctrlX AUTOMATION** platform has erased the traditional boundaries between machine control, IT, and the Internet of Things.

ften it takes weeks of work for a mechanical engineer to do something that a smartphone user can manage in seconds. Updating the operations of a production plant can still involve a tremendous effort, while smartphones simply need a new app to add the latest features.

Now Bosch Rexroth is bringing the world of the smartphone into factories with its new ctrlX AUTOMATION solution. "Nowadays mechanical engineering is just software development," explains Steffen Winkler, the responsible sales manager. To this end, the experts at Bosch Rexroth developed a solution that dramatically simplifies the job. The focus is placed on user-friendliness, flexibility, and open standards. "We have created an automation platform that removes the limitations of previous solutions," says Winkler. The technology includes controls, drives, motors, monitors, user interfaces, industrial PCs, and software. The core is the ctrlX CORE control unit with its powerful processor, which for the first time can be integrated into all relevant hardware components: in drives, in industrial PCs, and as an embedded controller.

The new end-to-end solution makes it as easy as possible for software developers. "We have chosen an uncompromisingly open platform," says Winkler. This involves a departure from manufacturer-specific standards, which is tantamount to a paradigm shift in the industry. The solution is based on the Linux operating system, which is known for its flexibility and security features. Other advantages include the use of app technology for programming, web-based engineering, preprogrammed features, and intuitive programming tools. Machine manufacturers can easily create individual functions themselves as apps, or purchase them externally and combine them with each other. Running independent of the hardware, the software can be updated much more easily, and with wireless options too. This makes machines ready to incorporate new standards anytime in the future.

The solution supports a wide range of programming languages and is no longer tied to specific machine languages that only specialists are able to master. At the same time, some of the components are only half the size, which reduces the required installation space in the control cabinet. These improvements can cut component and engineering costs by 30–50 percent.
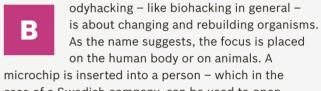
"There were also detractors who initially said it was impossible to transfer the world of the smartphone to automation," says Winkler. "We now know that we have made the seemingly impossible possible."

← *Alexander Fritsch*

One control for all platforms: ctrlX AUTOMATION offers this feat as one of its features.

PHOTO: BOSCH REXROTH

WILL WE SOON ALL HAVE IMPLANTS?

A Swedish company implants microchips under the skin of its employees – for example, to use in opening doors. Expert **Oliver Bendel** explains this method of bodyhacking and what the future holds.

B odyhacking – like biohacking in general – is about changing and rebuilding organisms. As the name suggests, the focus is placed on the human body or on animals. A microchip is inserted into a person – which in the case of a Swedish company, can be used to open doors. It can also be useful for animals, such as cats, the same as it is for humans. If it is an improvement, it is called human or animal enhancement. If technical resources or information technology is used, the result is called a cyborg.

A human cyborg points out that a microchip can also be used to pay or to capture and exchange data. It shows that this is only the beginning. You can install magnets in your home – or devices that allow you to determine which direction is north, to detect an earthquake, or feel colors. All this is already happening and exists today, and will probably increase in scope in the future.

The change is the freedom of the human cyborg. Its body is its own. However, one could reproach him for becoming a role model – even for those who do not sympathize with transhumanism, the transformation of the human condition. Likewise, for those who thought that piercing their ears or other body parts had been the most serious intervention to date. The freedom of every individual includes acting against general reason and one's own well-being. This can become a problem with children, because they cannot judge the consequences of their actions.

It also becomes a problem if politics and business put pressure on us, force us to have a microchip implanted or incorporate other artifacts in our bodies. Reasons might include ease of identification or – an important aspect in human enhancement and transhumanism – performance improvement. It is also questionable whether the improvement someone wants to achieve with animal enhancements serves only human beings. A data chip is useful for domestic pets and wild animals, a collar that creates a virtual fence for farm animals, as long as it gives them more freedom of movement. But if insects are equipped with microphones and cameras and remotely controlled, it will at best help spies and stalkers. ←

Dr. Oliver Bendel is an expert in information ethics, machine ethics, and information systems at FHNW university in Switzerland.

PHOTOS: LINDA POLLARI; WIKIPEDIA/NETSPY; GETTY IMAGES

"Our company will overcome the low point we are going through now, which is only slowly improving, and even has the stamina from within to maintain its old standing and stabilize it once again."

— Robert Bosch, 1926

Robert Bosch saw his company experience a crisis situation four times. The last crisis was also the most serious one: In the course of fiscal 1926, a slump in sales in the automotive industry resulted in a reduction of the workforce to some 6,400 – down from nearly 11,000. The situation gradually eased up, however. Management nevertheless made a "decision," which is the literal translation of the Greek word krisis. *Bosch established new business fields – without any experience in these fields, but with the necessary courage and brilliant acumen for market opportunities. This not only helped in subsequent economic crises, but also established the company's ability to transform itself.*

Dietrich Kuhlgatz
Bosch historian