

Interview on innovations and trends with Hans Beckhoff

## En route to Scientific Automation

→ In an interview with Ronald Heinze, chief editor of openautomation, managing director Hans Beckhoff talks about new technologies and global development at Beckhoff in the run-up to the SPS/IPC/DRIVES show in Germany.

Until the middle of this year, Beckhoff Automation showed an increase in sales of 22 %. "Consequently, we are expecting a turnover between 225 and 235 million euros this year," Hans Beckhoff revealed. The orders received have been consistently excellent, both at home and abroad. "We are also doing well in the USA, for example, with figures up 25 %" Beckhoff commented. Even though it has become more difficult to make growth forecasts in view of turbulence in the financial world, no noticeable effects on growth can be detected. "There is no measurable economic down-turn so far, although the general mood is a bit less secure," according to Beckhoff.

### Creativity drives innovation

At Beckhoff, the entrepreneurial principle of organic growth still applies. Nevertheless, due to positive experiences with the purchase and integration of the two embedded companies acquired last year, the managing director no longer wants to rule out additional acquisitions. "However, acquisitions are not our primary aim," declared Beckhoff. The integration of Embedded-Logic Design & More, the development specialist for motherboards, and BeDeHa, a specialist in BIOS software, went well according to Beckhoff: "The integration was a success from a business and personnel angle. It seems to me that the integration of personnel is particularly important, but this was carried out without a hitch. Beckhoff products in the IPC field are now developed jointly by the development departments in Verl and Münster, Germany."

The two subsidiaries are run independently from a legal and organizational standpoint. With Beckhoff Automation in the background, the two companies have made large-scale and important investments in the area of research and development and added staff since the take-over. So they are growing successfully. In 2008 they are due to move into a new building with a floor area of 1,200 m<sup>2</sup>. "Both companies still work independently for a wide range of industrial clients, one of which is, of course, Beckhoff," the managing director added.

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The success of the Verl-based company and the high level of innovative capabilities are unprecedented in the automation industry. How can the long-term creativity required for this be guaranteed? "The primary requirement is selection of the right staff," declared Beckhoff. "A liberal and open corporate culture in which technological development plays an important part also creates the right environment for unconventional ideas. Added to this are secure jobs and an atmosphere free from 'office fear' that tolerates potential mistakes and encourages gratification in the work," is the company philosophy. "We cultivate open, informal communication in the company. Following extensive democratic discussion, however, an executive decision is then made by the management responsible. In this way, the company stays 'on course' while simultaneously involving a large number of staff from all levels," explained Beckhoff.

### A leader in emerging technology areas

"It has been proven," Beckhoff claimed, "that our kind of automation technology also points to the path ahead for our partners in the automation market. To date, we have launched a groundbreaking technology onto the market at least every five years, even if in some cases its significance comes to light later." The managing director's view is that EtherCAT and eXtreme Fast Control Technology (XFC) in particular are securing the current advantage for Beckhoff.





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EtherCAT is developing in a particularly satisfying way. “The EtherCAT Technology Group (ETG), with currently over 600 member companies in 35 countries, is growing and thriving,” stressed Beckhoff. In addition to the ETG offices in China, Japan and the United States, in November, another office will open in Korea. A recent development is that EtherCAT has been approved as a SEMI standard (E54.20) by Semiconductor Equipment and Materials International, the standardization association for the semiconductor industry. In addition, EtherCAT has been a part of IEC 61158 since the 28<sup>th</sup> of September.

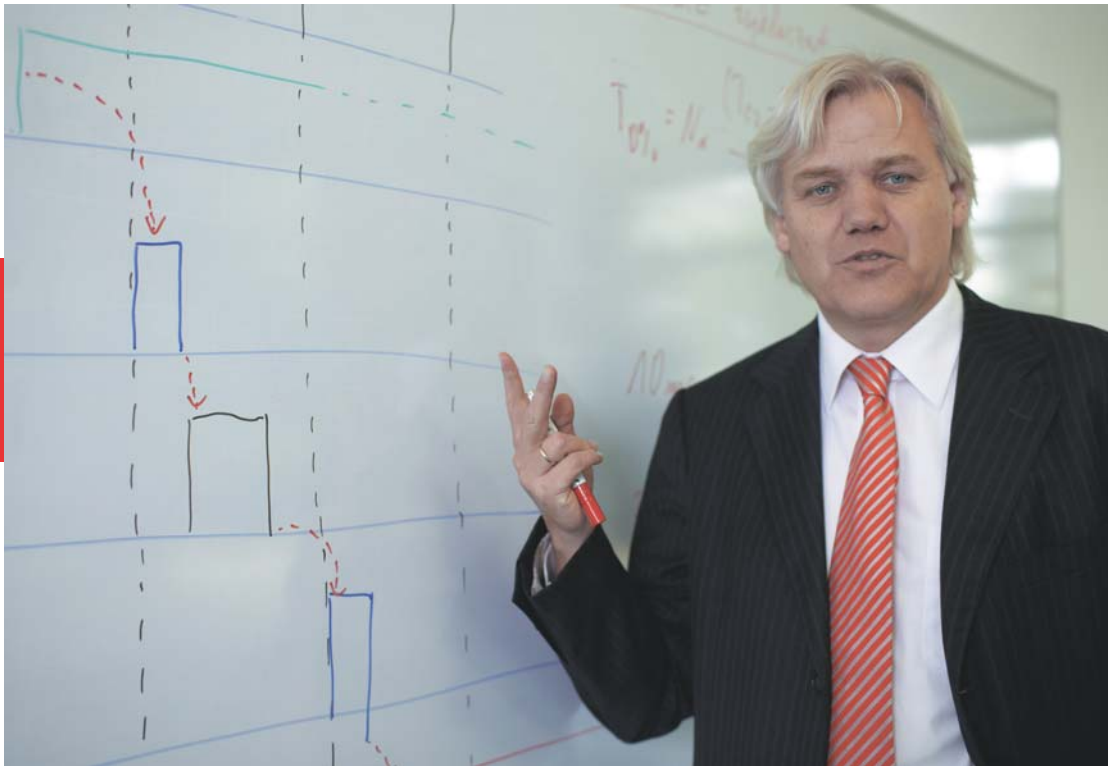
The field of functional security is also being systematically supplied with new Beckhoff products. There is already a comprehensive range of TwinSAFE I/O terminals available, which, according to Beckhoff, can accommodate 80 % of safety applications. Increasing numbers of users benefit from fieldbus-neutral safety communication. “This even allows the connection of entire production lines without any difficulty according to the functional security criteria,” added Beckhoff. This advantage is particularly evident in modular machine design. The AX5000 drive with integrated safety functions will be presented at the SPS/IPC/DRIVES show. Among other things, this drive controls the “safety-limited rotational speed” and “safe torque” functions.

A safety technology collaboration with Bosch, 3S and Wago, which Beckhoff describes as a “welcome joint development” will also produce tangible results in the near future: Beckhoff will present a Safety CPU at the next Hanover Fair. This will make a modular safety PLC available.

### **Automation technology can achieve a great deal more**

“Scientific automation is an exciting concept and should certainly stimulate the imagination as our sector depends on innovation to a substantial degree,” Beckhoff believes. In machine control technology, according to Beckhoff, there are some “traditional” technology areas. Among these are sequential control, which is implemented using a PLC, Motion Control that is implemented using motion software or appropriate functional modules, as well as control technology and HMI. All these areas used to be independent fields, which are today connected to one another via hardware and software.

“Now there are newer technology areas beyond these traditional application areas”, continued Beckhoff. “For instance, measurement technology with appropriate special devices is used for many high power applications.” It is therefore clear to him that, “the integration of high-end measurement technology with automation control will form the basis of scientific automation.” This can begin, for example, with vibration and oscillation analysis or statistical process data control, which are integrated into the world of automation. But it can also be relevant for completely different fields. A start has been made: for example, TwinCAT ScopeView, which is an integrated software oscilloscope, can provide exact data analyses. Additional developments have been announced by the managing director for next year: “At the next Hanover Fair, the scientific automation concept will spring to life.”



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In Hans Beckhoff's opinion, scientific automation will be substantially shaped by the user. "Each application area has its own engineering knowledge base and we believe that our clients will use the opportunities provided by scientific automation for their own unique purposes. That is why it is important to develop wide-ranging expertise in multiple sectors," according to Beckhoff. He is convinced that all automation technology suppliers will integrate many more scientific fields into their product ranges in the future. "There is an exciting future," he continued. "Scientific automation is many-sided and demands imagination and creativity from the engineers." The basis of scientific automation is the continually increasing performance of PCs, which Beckhoff is promoting vigorously with its own motherboard development.

"We are developing our automation technology in several important directions," Beckhoff remarked. The targets here are ease of application, optimization of engineering tools, a favorable price-to-performance ratio, high performance as well as high efficiency, which leads to sustainability, among many other benefits. "The concept of scientific automation represents our plan to make scientific progress available through our technology to a wide range of application fields in a cost-effective and simple way," Beckhoff said. "Of course, we gain special satisfaction from achieving technology milestones or exceeding performance limits. A great success in this regard was with XFC technology, which now makes 100  $\mu$ s I/O response times available in control technology." This ultra-fast control technology is already being applied, as Beckhoff added, such as in the field of printing machines, injection molding systems and other rapid processing machines.

## Modular engineering tools in development

Software also plays an important part. "With our TwinCAT product family, we already offer a software suite that has been growing steadily for years and enables highly effective operation," Beckhoff claimed. "The TwinCAT Workbench has been expanded by numerous supplements over the last few years. Data from an ECAD system can be simply transferred. These perpetually expanding programs can be managed in a source code database." Beckhoff currently has tools under development that support modularization on the basis of IEC 61131-3 and enable reuse of software as well as automatic generation of different versions. Moreover, work has started on tools for module versions, maintenance of modules and projects, as well as those for ongoing simulation. "We believe that a modular, hierarchical project structure with well defined and generally accepted module interfaces provides a powerful and manageable platform," Beckhoff emphasized. "We are developing the necessary tool set for this, which will be presented in 2008. Modularization on a software basis is a significant and absolutely vital advancement for automation."