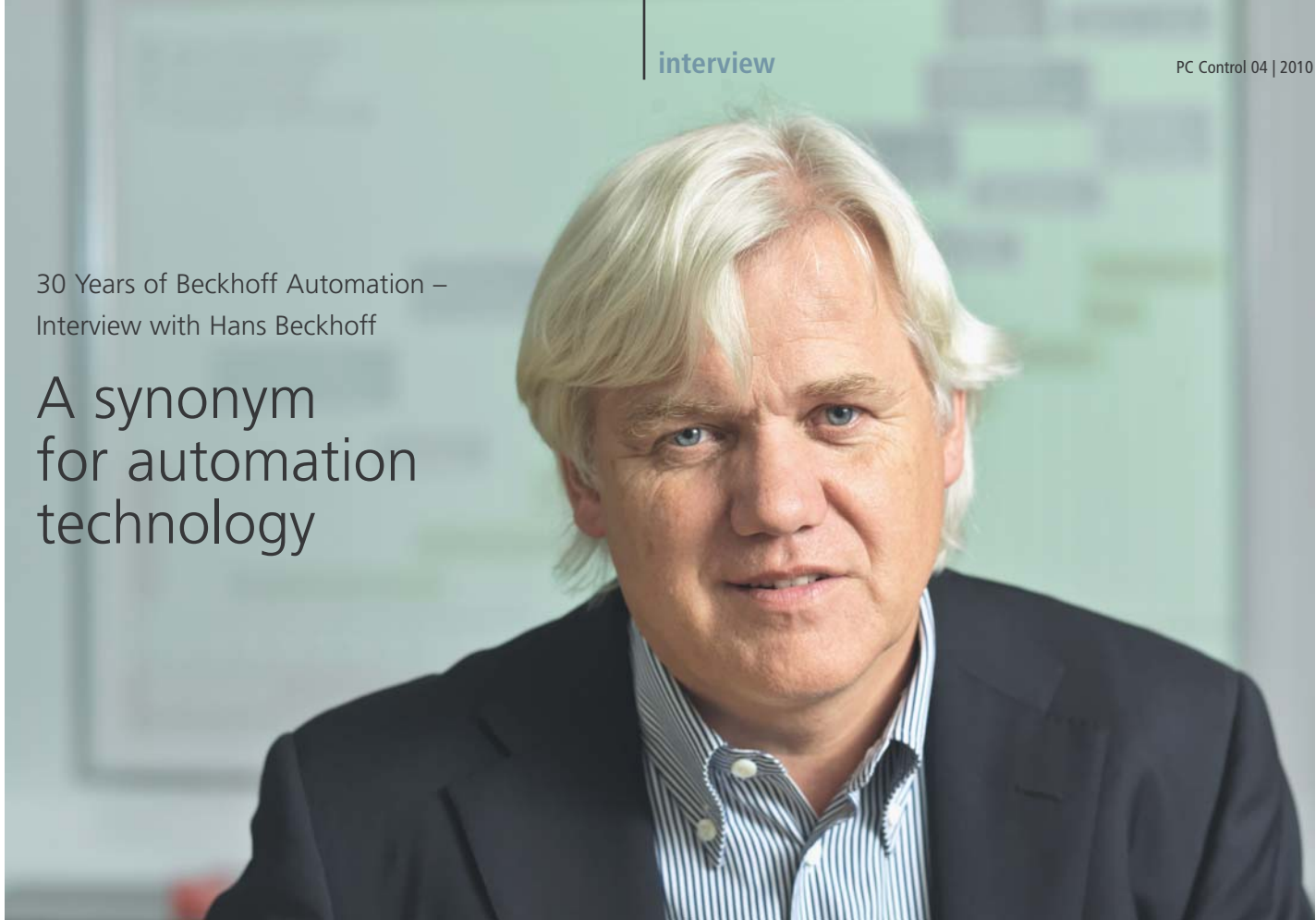


30 Years of Beckhoff Automation –
Interview with Hans Beckhoff

A synonym for automation technology



It has been thirty years since Beckhoff Automation began PC-based control technology. In an interview with Ronald Heinze, chief editor of Open Automation, company founder Hans Beckhoff reviews the past and announces the next milestones in automation technology: for example, the systematic modularization of functionalities for TwinCAT 3.

Over the past 30 years Beckhoff Automation has grown from a staff of one to 1400. From an annual turnover of 50,000 Deutschmarks (DM) in the first year, Beckhoff has recorded a sales increase of over 45 % in the current year so far. A target of 340 million euros is set for 2010 which could be exceeded depending on the end of year performance. "We have recorded a high growth in sales in all areas, both geographically and across sectors. Worldwide machine construction is recovering its previous strength," according to director Hans Beckhoff. "The Chinese market is one main growth area. But we are currently growing at 45 % in the United States and Germany as well." Beckhoff is also optimistic for 2011 and anticipates a two-figure increase in sales. Current growth generators include alternative energies according to Hans Beckhoff, these contributing 15 % to total sales. The strong growth requires an expansion in production with new production facilities and manufacturing machines as well as ongoing recruitment of new staff. "We are currently taking on new staff every week," the director remarked.

Rapid development

"This rapid development means we are in a constant state of flux," Hans Beckhoff stated. Despite this, the company displays a high level of stability in terms of staff, customers and products. Thirty years ago Beckhoff started with only a few engineering customers in and around Westphalia/Germany: today the company has a global distribution network with 27 subsidiaries. This year new sales offices were established in Israel, Singapore, Malaysia and Japan.

"Automation is an innovative but also very stable sector," according to Hans Beckhoff. "It is controlled by technical progress on the one hand and by long-term stability of the products and their delivery reliability on the other." Beckhoff is still supplying the same Lightbus I/O modules which came onto the market at the beginning of the 1990s.

The last 30 years in automation technology have been marked by technological milestones which have had a crucial effect on automation products. Among these Hans Beckhoff includes on his list microprocessor technology as the technological basis for controls design and PC technology with the subsequent linking of IT and automation technology – the key words here being Windows and real-time. Beckhoff sees fieldbus technology as having an important influence on control architectures. "The development of the Bus Terminal enabled automation to be decentralized. The integration of different functions, such as sequential control, motion control, robotics, CNC, control and communication technology on a single platform had an equally marked effect on automation technology and will continue to do so in the years to come." A further important point mentioned by Beckhoff is the digitization of functional safety technology.

Getting the right balance

"Some important decisions have been crucial for the company's development," Hans Beckhoff stressed. One of the first decisive questions was whether to establish an engineering office or a factory. He decided in favor of a factory and, as

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early as 1983, defined his own product range. Of equal importance was the decision to establish a sales department and the associated marketing in addition to product development and manufacturing. “A close relationship to the customer is very important,” as Hans Beckhoff knows. These days a similar amount is spent on sales and marketing as is on product development. The third important business decision relates to the business model where the focus is on general automation technology instead of application niches.

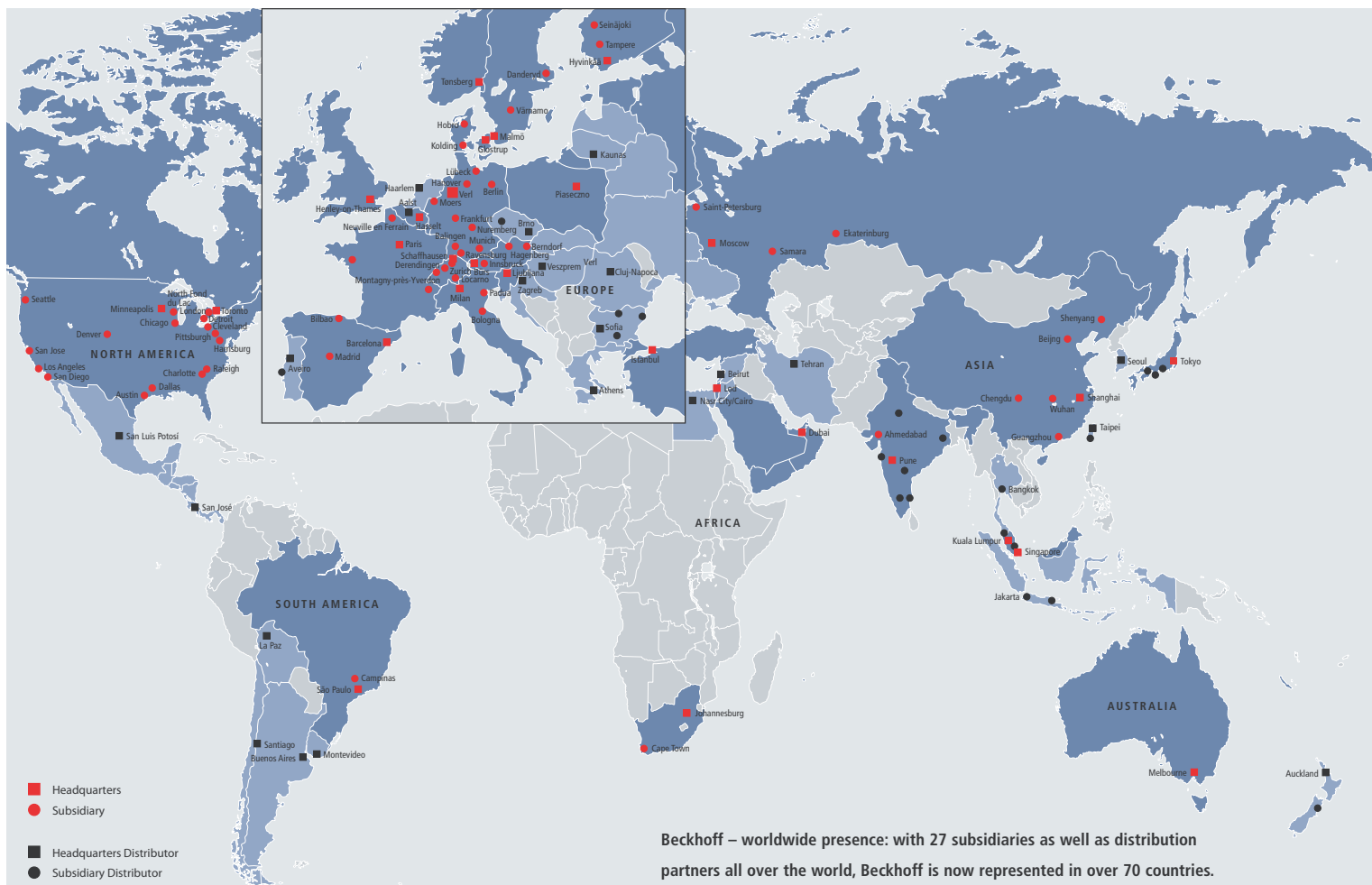
Beckhoff describes itself as a technology company. “The important aspects have not changed,” according to Hans Beckhoff, “which are having fun while you work and truly enjoying advanced technology.” This is also reflected in the high employee loyalty which Beckhoff describes as “a great asset for us and our customers.” Customer loyalty is equally impressive. “We are gaining new customers and only very rarely lose some. The long-term collaboration often develops into close relationships almost akin to friendships with our customers. We rely on each other, not only at home but abroad.” A further characteristic of Beckhoff automation technology is its longevity. As technology itself may become complex, it is of vital assistance to the customer when the technological contacts stay the same

over the years as is frequently the case at Beckhoff. Hans Beckhoff stresses the importance of getting the right balance among customers, staff, suppliers, the geographic location, its community and the business sector. These are some of the most fundamental considerations for any successful business.

The technology highlights: EtherCAT and Scientific Automation

Does the pioneer of PC-based control technology see any future for the traditional PLC? “Hardware PLCs have a future – despite the increased growth of PC-based systems,” Hans Beckhoff believes. “The traditional suppliers such as Siemens, Omron, Mitsubishi and Rockwell continue to focus predominantly on this technology.” These suppliers are only just beginning to push PC-based control technology. So PC-based control technology will not generally replace PLCs in the foreseeable future – at least not in terms of market volume.

This has benefits for a company like Beckhoff. For example, up until now the Japanese market has been completely dominated by the large Japanese hardware PLC manufacturers. “There has, in effect, been no PC-based control technology up until now,” according to Hans Beckhoff. “This means that this market segment has not yet been filled.” Beckhoff Automation is now beginning to work on the conservative Japanese market and is convinced of finding supporters for its own control philosophy there – as an alternative to traditional control systems. “This market may be small by comparison, but for us as a medium-sized company, it still achieves a respectable volume,” remarked Beckhoff. There is also a certain sporting ambition underlying this because, Hans Beckhoff believes, “anyone who succeeds in the difficult Japanese market can do so anywhere.” This project is helped along by EtherCAT which “has been well received in Japan,” according



Beckhoff – worldwide presence: with 27 subsidiaries as well as distribution partners all over the world, Beckhoff is now represented in over 70 countries.



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to Beckhoff. The EtherCAT Technology Group (ETG) already has 120 members in Japan alone. For example, Omron has made a clear commitment to EtherCAT.

“We have had success all over the world with our EtherCAT protocol,” stated Hans Beckhoff, “both from a technology angle as well as commercially. We are proud to have established a standard technology which is used across the globe. Not least because I believe it has enabled us to contribute to the progress of mankind a little.” Today EtherCAT is used worldwide. There are countless examples of EtherCAT applications, both with and without Beckhoff components.

“By opening the EtherCAT protocol we were able to establish a platform on the market with an open system architecture for users and suppliers of automation technology” Hans Beckhoff says with satisfaction.

Beckhoff also wants to promote automation technology in terms of functionality. “Today, machine-oriented measurement technology belongs in the control system as does motion control which has become a normal component of the control system in the last 10 years,” Beckhoff continued. It is therefore only logical that the Bus Terminal range is continuously and systematically expanded with fast, precise modules which can capture signals with a higher resolution. The associated extension of the software can be taken care of by, for example, libraries for the analysis of the measurement values. “Our new TwinCAT version 3 enables a close link to standard peripherals based on Matlab or Labview,” Beckhoff added. The integration of measurement technology into the automation environment is an important step in the direction of Scientific Automation.

The technology highlights: TwinCAT 3 and XFC

TwinCAT in the new version 3 sets standards when it comes to incorporating tools. “We have discussed this topic in depth with almost all our customers and have received extensive feedback,” Beckhoff continued. One significant benefit

of the measurement technology integrated in the control system is that internal variables and external measurement values do not need to be synchronized because they are all in one memory. The integrated control and measurement technology simplifies central handling, thus opening up great optimization potential for machine builders.

TwinCAT 3 forms the focus of the presentation at the SPS/IPC/DRIVES 2010 in Nuremberg, Germany. Completion of the software is on schedule. The beta version will be ready for customers to test at the start of 2011. “The software will then be released in mid 2011,” Hans Beckhoff announced. The new software version also provides the technological requirements for a further planned development stage: the systematic modularization of software functionalities. “In the future we want to assemble software modules in a similar way to our I/O terminal modular systems,” said Beckhoff, looking to the future. In addition to own modules from Beckhoff, software modules from third party suppliers can be used with TwinCAT 3. The aim of this is to get TwinCAT 3 quickly ready for special applications. For example, users or specialized engineering companies can provide algorithms for special applications.

The fast control technology XFC (eXtreme Fast Control) is already on the path to success. “The ability to achieve 100 microseconds response time has gained us many customers,” reported Beckhoff adding, “XFC provides an important contribution to increasing the efficiency of machines and conserving resources. This delivers high benefits at a low cost.” Fast control technology therefore also helps to save energy and to increase the efficiency of machinery and systems. “Our control technology promotes environmental and economic objectives alike,” Hans Beckhoff says with satisfaction. He sees the latter – from the angle of equalizing the living conditions of emerging countries such as China – as very important. “Automation technology therefore bears a high social responsibility,” he stated.

Growth in all markets

Hans Beckhoff believes that automation technology performance still has a long way to go. True to the statement coined years ago – that the function-related price decreases by 30 to 50 percent every ten years – he sees further potential for improvement in nearly all product areas. “This opens up even more new application areas for our products,” he stressed. “But the sectors already occupied such as machine construction, building control, process technology and embedded solution devices are still capable of expansion.” With machine construction the main objective is to gain a further share of the overall project. Hans Beckhoff sees openings for this in measurement technology, electrical drive engineering and also CNC applications.

In addition, the company’s product range is being extended in the technology area of drive engineering. Currently, servomotor development and production is being established in collaboration with Erwin Fertig, the founder of Elau, in Marktheidenfeld/Germany. Fertig Motors, who are involved with the Beckhoff Group in a joint venture, will focus production on highly dynamic servomotors. The first production series devices are expected at the end of 2011. “This is a big step for Beckhoff. We have always been specialists in hardware and software and naturally we had a high level of drive expertise. But the development of our own motor series will markedly expand and deepen this expertise. We are delighted about this development and are convinced that we will be able to offer our users even more efficient system solutions,” Hans Beckhoff added.

Further sales development

Beckhoff will continue to invest in the development of its sales network. Hans Beckhoff is convinced that general automation technology must be

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marketed everywhere. “It makes sense to have a dense geographical presence,” according to Beckhoff. “So we will continue to expand our sales network. This applies to Germany and the rest of the world alike.” The number of sales staff is thus growing constantly.

In addition to this, vertical market-related sales will be developed. Over the next decade Hans Beckhoff plans to establish centers of competence within the company where technology experts with extensive knowledge of the vertical market will develop the best solutions jointly with their customers.

Between 1990 and 2000 the company grew by a factor of ten. Due to two financial crises, a growth factor of six was recorded between 2000 and 2010. For the next ten years Hans Beckhoff makes a more cautious estimate, dependent on the development of the world economy: a target growth factor of 4. Beckhoff Automation will then be able to show a turnover of 1.2 billion euros. This requires a corresponding development in the number of employees which is planned to triple by 2020. There will then be 3000 staff employed at the company headquarters in Verl alone. A company initiative involving universities aims to find the best and brightest employees. “For example, this year we have started giving 20 future young engineers the opportunity to practice-integrated studies,” Hans Beckhoff explained.

The vision for the next 10 years

In 10 years Beckhoff Automation will have reached a new order of magnitude: above all it will have an even greater international presence. “However, staff and customers should continue to find themselves in friendly, human-scale surroundings which we wish to ensure through a well-organized company structure,” Beckhoff continued. “External turnover will then be around 70 %” according to his forecasts.

Beckhoff Automation will be working hard to become a global technology address for automation technology, combining expertise in many sectors. The expectation is that an ever growing number of customers will turn to the company for all areas of automation technology: Beckhoff – a synonym for automation technology.

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Ronald Heinze, editor-in-chief of
openautomation

interview



Beckhoff milestones – standards for automation

Since the company was established on July 1st 1980, consistent development of innovative products and solutions using PC-based control technology has been the basis of our continuing successes. Many automation technology standards that are taken for granted today were recognized by Beckhoff at an early stage and successfully marketed as innovations.

- 1982:** P1000 – single-board motion controller
- 1986:** PC Control – first PC-based machine control
- 1988:** S1000 – Software PLC/NC on PC (DOS)
- 1989:** Lightbus – fast fieldbus based on optical fiber
- 1990:** All-in-one PC motherboard
- 1995:** Bus Terminals – fieldbus technology in compact terminal block format
- 1996:** TwinCAT – real-time software solution under Windows with PLC and Motion Control functions
- 1998:** Control Panel – detached IPC Control Panel
- 1999:** Fieldbus Box – the I/O system in IP 67
- 2002:** CX1000 – modular Embedded PC for DIN rail installation
- 2003:** EtherCAT – real-time Ethernet system
- 2005:** TwinSAFE – safety solution for the Bus Terminal system
- 2005:** AX5000 – EtherCAT servo drive
- 2007:** Industrial motherboards – Made in Westphalia, Germany
- 2008:** XFC – eXtreme Fast Control
- 2009:** HD Bus Terminals – 16-channel terminals in 12 mm
- 2010:** TwinCAT 3 – eXtended Automation (XA)