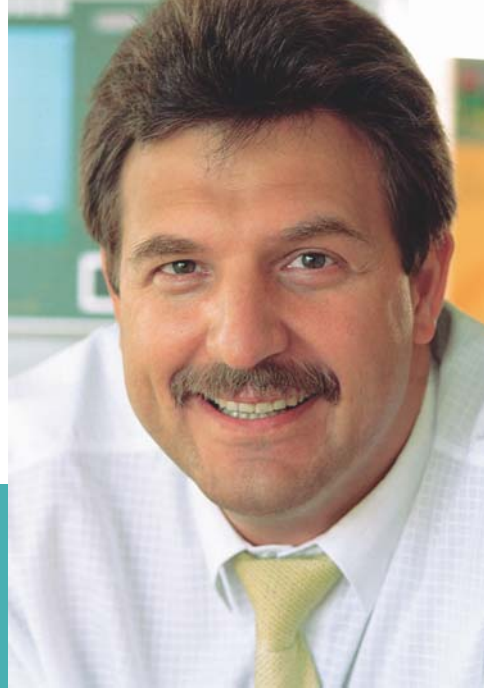


## Embedded technology – a sector with a bright future



For more than two decades, Beckhoff has successfully promoted the idea and freedom of PC-based control technology, which has proven to be highly reliable, flexible and future-oriented. What then could be more obvious than applying this technology in new areas within and outside industrial automation? The basic idea is to scale PC technology in terms of price, performance and physical dimensions in such a way that applications with small and medium requirements are also feasible. These were the considerations that led to the birth of Embedded PC products from Beckhoff.

What does “embedded” actually mean, why is it important to care about it and how does Beckhoff chart its product range to it?

The first question is not easy to answer, because the term “embedded” covers a wide range of hardware and software components available on the market. Beckhoff uses the term for controllers and associated components with a self-contained character with regard to hardware, signal processing, operating system, maintenance and updates. Beckhoff embedded modules are compact, modular, DIN rail-mountable, fanless and have not much in common with the traditional appearance of a PC. In addition, storage is based on flash technology as a basic principle, and all embedded controllers offer the option of connecting Bus Terminals or EtherCAT Terminals directly without cables. Beckhoff uses Windows XP Embedded and Windows CE in predefined and preconfigured forms, depending on the hardware. The user can install additional programs and use the PC features as required.

Embedded technology offers convenient maintenance and installation of updates: The operating system and the application can be upgraded simply by replacing the Compact Flash card.

All the above-mentioned features are met by controllers from Beckhoff's CX family, with brand new members that will contribute to the continued success of the series: CX9010, CX1010 and CX1030 are characterized by faster processors (Intel® IXP 533 MHz, AMD Geode 500 MHz, Intel® Pentium® M 1.8 GHz) and offer the user adequate potential for larger projects.

“Embedded” also means that the profile of the electronic components has to be tailored to the special customer requirements. This can only succeed with in-house board development know-how. In this area Beckhoff took a significant step last year with the acquisition of two companies: Embedded-Logic Design & More

and BeDeHa, based in Münster, Westphalia, Germany. We are now able to develop and produce our own motherboards and implement the required BIOS adaptations. The motherboards – made by Beckhoff – are used for our own Industrial PC and Embedded PC products, and from mid 2007 will also be offered as separate, standard products. This initiative is aimed at customers and device manufacturers from the traditional embedded sectors who are often unable to meet their profile-specific requirements with standard boards, including automotive, avionics/aerospace, industrial automation, telecommunications, consumer electronics/intelligent homes and health/medical equipment. These customers can benefit from the fact that Beckhoff offers a 5-year guarantee of supply for their motherboards and that the new CPUs and chipsets are largely implemented with installation compatibility maintained. Specifically, this means that customers do not have to modify their devices if they decide to introduce a new CPU generation.

Back to the question as to why one should care about embedded technology. Sales of computer-based embedded hardware are estimated at around US \$ 40 billion worldwide; the current figure for embedded software is US \$ 38 billion (source: FAZ 03/2006). According to a study on behalf of the European Commission, by 2009 the hardware market for embedded systems will have reached US \$ 71 billion. The share of industrial systems is estimated at around 15–20 %, ranking third after “health/medical” and “telecommunication”. Beckhoff naturally offers particularly extensive support for their traditional business serving the industrial automation business – in terms of a hardware example, through the development of Mini PCI fieldbus cards and Mini PCI NOVRAM cards for motherboards, and on the software side through the consistent further development of TwinCAT under the Windows CE operating system.

However, sales alone are not the decisive factor for promoting embedded products: it is in fact the wide range of exciting embedded applications and imaginative solutions implemented by our customers, many of which find their way into “PC Control” magazine in the form of application reports. This valuable feedback helps us advance the technology even further.

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