User and manufacturer association with more than 60 member companies

EtherCAT Technology Group established

The EtherCAT Technology Group (ETG) was established during the SPS/IPC/DRIVES fair on November 26 in Nuremberg, heralding the opening of EtherCAT. The ETG aims to prepare EtherCAT optimally for as wide a range of applications as possible. The interest in EtherCAT and the ETG is tremendous, both from the user and the supplier side: Within four months, more than 60 members – among them several well-known international companies – joined the group.

EtherCAT (Ethernet for control and automation technology) is the Ethernet solution for industrial automation, characterized by outstanding performance and particularly simple handling. EtherCAT was developed by Beckhoff and presented for the first time at the 2003 Hanover Fair.

The first EtherCAT products to be introduced by Beckhoff are EtherCAT terminals. The I/O, protection class IP 20, is based on the housing of the highly popular Beckhoff Bus Terminal system. In contrast to Bus Terminals, where the fieldbus signal is implemented within the Bus Coupler, the EtherCAT protocol remains fully intact down to the individual terminal.

EtherCAT devices from different manufacturers were already shown at SPS/IPC/DRIVES. TR-Electronic, for example, presented an EtherCAT shaft encoder. Martin Rostan, Beckhoff product manager for EtherCAT, looks ahead: "At this year's Hanover Fair we will introduce further products with EtherCAT interfaces. Other manufacturers have also announced devices such as sensors, drives and controllers."

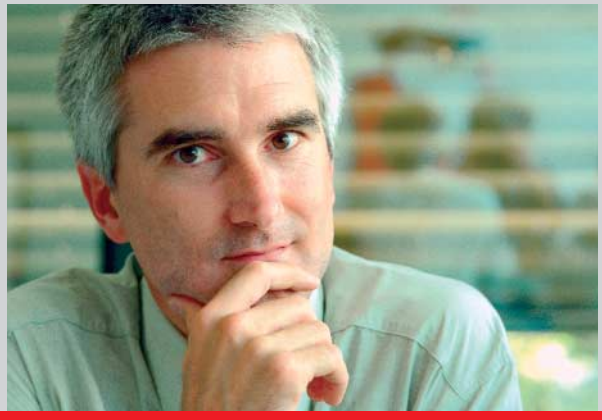
The first pilot applications have been commissioned

The basic development of EtherCAT is largely completed, and pilot applications are already proving the benefits of the technology in practical applications. The first EtherCAT devices are already being used in applications that could not be realized with conventional fieldbus systems – and thus not with any other real-time Ethernet approach. One example is the new Schuler AG press controller. In a pilot project for their new Profiline press generation, Schuler is using EtherCAT for the communication between peripheral devices and the PC-based control system (see article on page 22).

Disclosure phase has started

The establishment of the EtherCAT Technology Group initiated the disclosure phase. By being an open protocol, everyone should be able to use and implement EtherCAT, and the ETG promotes this philosophy. The ETG is a forum for end users from different sectors, and for machine manufacturers and suppliers of powerful

Hans Beckhoff: "Naturally, EtherCAT is particularly suitable for fast PC-based control technology. The master requires no special plug-in card and can be implemented on any existing Ethernet controller using a very simple interface. EtherCAT is therefore also well suited to small and medium control technology, where it will also open up new areas of application for distributed I/Os."



Martin Rostan: "EtherCAT is clearly structured and has a modular design, so that amendments, with support from the ETG, are still possible after the first specification: EtherCAT has great potential and is bound to influence automation technology over many years."

control technology with the aim of supporting and promoting EtherCAT technology. With their qualified feedback, the system partners ensure simple integration of the hardware and software components in all required device classes.
"The integration of key customers in the development of new technologies at an early stage is tradition in our company", said Hans Beckhoff, General Manager of Beckhoff. "This was already tried and tested with our Lightbus, introduced in 1989. It meant that the device was particularly powerful and simple to configure right from the start and had excellent diagnostic features. With EtherCAT, we have transferred the basic principles of the Lightbus to Ethernet technology, thus creating the fastest Industrial Ethernet currently on the market."

Aims of the EtherCAT Technology Group

At the press conference covering the establishment of ETG, which was attended by more than 40 editors of German and international technical journals, Hans Beckhoff summarized the tasks and objectives of the ETG:

- Support for EtherCAT technology
- Critical analysis of the EtherCAT features and their implementation
- Provision of information on product, sector and application-specific requirements
- Development of application and device profiles (e.g. in order to achieve optimum device integration and interface design)
- Assistance and promotion of the disclosure of EtherCAT

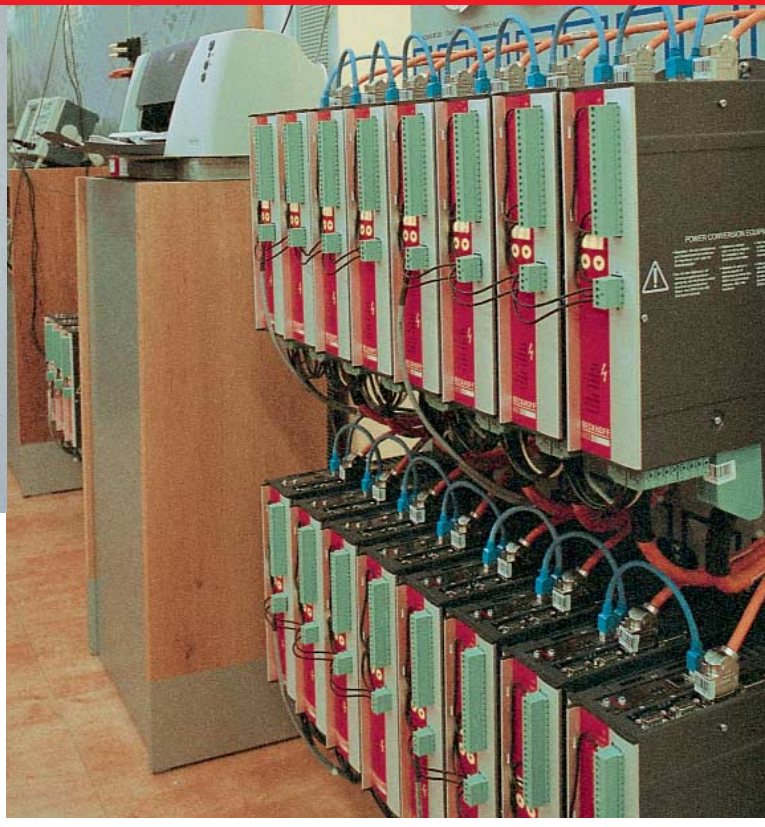
Next Steps

EtherCAT will be disclosed, once the specification is complete. Hans Beckhoff stresses the benefits of disclosure for his company: "In all three product areas that our company is involved with – fieldbus technology, Industrial PCs and control software – we have consistently used open interfaces and open systems right from the start. This approach has been well received and is very successful. It therefore made sense to follow the same approach with EtherCAT.."

The EtherCAT Technology Group members at a glance:

ABB Power Technologies AB, Switzerland
ABB Stotz-Kontakt GmbH, Switzerland
Alstom Power Conversion, Germany/France
Andrive Antriebstechnik GmbH, Germany
Applied Materials Inc., USA
Aradex AG, Germany
Baldor UK Ltd, United Kingdom
Balluff GmbH, Germany
Baumüller Electronic GmbH + Co. KG, Germany
Beckhoff, Germany
Binar AB, Sweden
b-plus GmbH, Germany
Brosis Engineering GmbH, Germany
Bruderer AG, Switzerland
Cleveland Motion Controls, USA
Continental AG, Germany
Danaher Motion GmbH, Germany
Danaher Motion Stockholm AB, Sweden
Deutschmann Automation, Germany
Dieffenbacher GmbH & Co., Germany
Digitronic Automationsanlagen GmbH, Germany
DLR e.V., Institut für Robotik und Systemdynamik, Germany
ESR Pollmeier GmbH, Germany
Finn-Power Oy, Finland
Focke & Co., Germany
Fraba Posital GmbH, Germany
Fronius International GmbH, Austria
GAS Gesellschaft für Antriebs- und Steuerungstechnik mbH, Germany
Hans Turck GmbH & Co. KG, Germany
Heesemann GmbH & Co. KG, Germany
Hilscher GmbH, Germany

Martin Rostan: "EtherCAT protocols are processed in hardware within an ASIC; implementation will only occur once the specification has been finalized. EtherCAT was specifically developed and optimized for low connection costs, so that a very competitive ASIC unit price can be assumed. The ASIC is expected to be available during the 4th quarter. Until then and beyond that time, the current FPGA-based solution represents a cost-effective connection that also makes sense for standard devices."



Beckhoff will continue to steer the EtherCAT technology, even after its disclosure. Martin Rostan said: "EtherCAT is and remains a Beckhoff technology, although we are going to make it available to all interested companies without conditions. Openness means that everyone can use the technology - that is our aim. If everyone was allowed to change the technology, incompatibilities and chaos could be the result. We want to avoid this."

EtherCAT will be subject to international standards

Disclosure is not only driven from within the ETG – the international standardization of EtherCAT has already been initiated. Both the Real Time Ethernet Working Group of IEC and ISO have accepted an accelerated standardization procedure for EtherCAT, so that EtherCAT is expected to obtain the status of an official IEC or ISO specification quite soon.

ETG kick-off-meeting

The first meeting of the EtherCAT Technology Group took place on March 9/10 in Frankfurt. Interest from ETG members was tremendous: more than 70 participants from 45 member companies attended the meeting. EtherCAT's technology was introduced in detail in presentations, and through the specification and practical demonstrations. The feedback and the requirements of users and manufacturers will be taken into account during the next phase of development.

A detailed report about the first ETG meeting will follow in the next issue of PC Control.

Husky Injection Molding Systems Ltd., Canada
IgH, Germany
IMA Automation GmbH, Germany
Imperial Tobacco Limited, USA
IVO GmbH & Co, Germany
Jetter AG, Germany
Kayser-Threde GmbH, Germany
Komax AG, Switzerland
Kuka Controls GmbH, Germany
LG Industrial Systems, Korea
Lust Antriebstechnik GmbH, Germany
MTS Sensor Technologie GmbH & Co. KG, USA
Müller Weingarten AG, Germany
Philips Medical Systems, Germany + Netherlands
Reis Robotics, Germany
Saia-Burgess Controls AG, Switzerland
Schmidhauser AG, Switzerland
Schuler AG, Germany
Servo Dynamics Inc., USA
Sigmatek GmbH & Co. KG, Austria
SND Smart Network Devices GmbH, Germany
ST Microelectronics, Switzerland
Stöber Antriebstechnik GmbH & Co., Germany
TAS Engineering AG, Switzerland
Test-Fuchs Ges.m.b.H., Austria
ThyssenKrupp Presta, Principality of Liechtenstein
TR-Electronic GmbH, Germany
Unidor GmbH, Germany
Wiedeg Elektronik GmbH, Germany
WST Systemtechnik GmbH, Germany

EtherCAT: History and roadmap

Notwithstanding the still "young" technology, EtherCAT has a history that started with the market introduction of the Beckhoff Lightbus, on which the EtherCAT technology is based in principle.

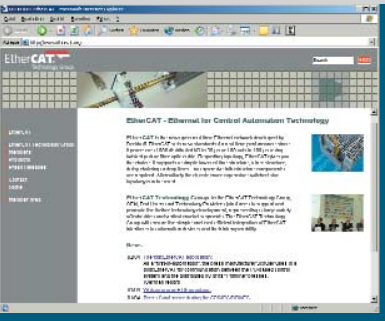
1989 | Market introduction of the Beckhoff Lightbus – the fast optical fiber fieldbus

1995–1999 | Beckhoff start working on a next-generation fieldbus under the working title "Fast Lightbus" (FLB)

2000–2003 | Draft EtherCAT system – synthesis of Ethernet and Fast Lightbus

2003
| Presentation of EtherCAT technology at the Hanover Fair
| First EtherCAT devices: I/O terminals, encoders, drives
| Contribution to IAONA, submission for IEC standardization
| First pilot applications in Schuler presses

2004
| First EtherCAT Technology Group conference in Frankfurt (March 9/10)
| Completion of the EtherCAT specification (2nd/3rd quarter)
| Disclosure of the EtherCAT protocol (3rd quarter)
| Delivery of a first EtherCAT communication ASIC (4th quarter)



The ETG website

Comprehensive information about the EtherCAT Technology Group can be found online at: www.ethercat.org . In addition to basic information about EtherCAT technology, the site contains press releases, information about ETG members, and relevant news. Products with EtherCAT interface are listed under the "Products" heading. In future, information about third-party components will also be available online.

→ www.ethercat.org

Control Engineering announces winners

„Engineers' Choice Awards" for EtherCAT

Control Engineering, one of the main North American automation magazines, announced the eight winners of its first "Engineers' Choice Awards" at the recent National Manufacturing Week 2004 in Chicago. EtherCAT, the real-time Ethernet solution, came first in the "Networks and Communications" category.

The selection criteria for the "Engineers' Choice Awards" were: service to the industry, technological advancement, and market impact. Seven editors used these criteria to compare and judge the thousands of products and solutions covered each year in Control Engineering's print, web, and e-mail publications. A total of 35 products were nominated. The winners in the eight categories were then selected by subscribers to Control Engineering's North American edition.

Graham Harris, general manager of Beckhoff Automation LLC, accepted the award for Beckhoff. He said: "Sense, decide, and act are the three cornerstones of the control and automation field and its many related industries and applications. Similarly, the three cornerstones of the "Engineers' Choice Awards" are service to the industry, technological advancement, and market impact. We are therefore very proud to have received this award."

→ www.controleng.com