15 years of the ETG – a true success story

EtherCAT® Technology Group

Martin Rostan, Executive Director of the ETG

When we set out 15 years ago to establish our then new Ethernet fieldbus system, EtherCAT, in the international arena, we were very much young upstarts. Beckhoff, the company that invented EtherCAT technology, seemed much too small at the time to attempt something like that in earnest. But it did not stop us trying. There was no fieldbus industry association to provide us with a platform or ease access to international standards bodies. All we had was a revolutionary piece of technology that was compelling in the truest sense.

What we did back then would now probably be termed "disruptive". When we launched the EtherCAT Technology Group (ETG), its rules were unconventional. It was important to keep the barrier to entry low so as to quickly attract a critical mass of member companies; we also kept the group exceptionally open, and provided developer support free of charge – even to competitors. And the group's organizational structure was designed to achieve rapid results.

When the ETG launched at the SPS/IPC/Drives show in 2003, it had 33 founding members. They included a substantial number of big-name users, and this helped pull in their suppliers, as well. Eight months later, the number of member organizations had already climbed to 100; after five-and-a-half years it had exceeded 1,000 – a level beyond our wildest dreams when we first started out. Now, 15 highly successful years later, we have more than 5,000 members – companies as well as universities – in no fewer than 65 countries, and there is no sign of that growth stalling any time soon.

When the doorway to international standardization eventually opened a crack, we jammed a foot in it – and succeeded in making EtherCAT an IEC specification in 2007. The ETG was also quick to venture onto other continents, opening up offices in China, Japan, Korea and the US. Today, the ETG is the largest fieldbus user organization in each of these countries.

Since the very beginning, many of our members have played a highly active role in the technical working groups. They help to refine the technology and expand it in specific directions. They also genuinely enjoy doing so. We hear, time and again, that people find things a little more easy going in the working groups and ETG offices than anywhere else – less formal, but all the more results-driven. And the engineers like it that way. Nonetheless, the Technical Advisory Board makes sure that EtherCAT stays solid and stable: Expansion is allowed; modification is not.

The success of the past 15 years has been driven primarily by the compelling technology itself. But a highly motivated team, with exceptional backing from Beckhoff, has also been key to making that success happen. And the young upstarts of yesteryear, have they turned into contented group officials? As anyone who knows us will doubtless confirm, not in the slightest!

Further information:
www.ethercat.org

EtherCAT: field-proven technology with clear application advantages

The capabilities of the EtherCAT technology are not only evident from the growth and success of the EtherCAT Technology Group. From the very beginning, EtherCAT proved its worth by delivering tangible application benefits, and these are illustrated here in a small selection of customer projects from recent years, with testimonials from satisfied users.

Automotive industry: robot-assisted assembly of automotive sub-assemblies

Brent Lekx-Toniolo, Control System Concept Developer with Sodecia GTAC, based in London, Canada: "EtherCAT enabled us to implement all relevant diagnostic functions. For example, we've used its features to localize cable breakage right down to the exact cable in the line, resulting in indicators that blink on the HMI. Thanks to the openness and compatibility of EtherCAT, we can easily integrate and monitor EtherCAT slaves from other manufacturers with identical diagnostic functions."

Further information:
www.pc-control.net/pdf/012016/solutions/pcc_0116_sodecia_e.pdf

Electronics production: dispensing system for car heater manufacturing

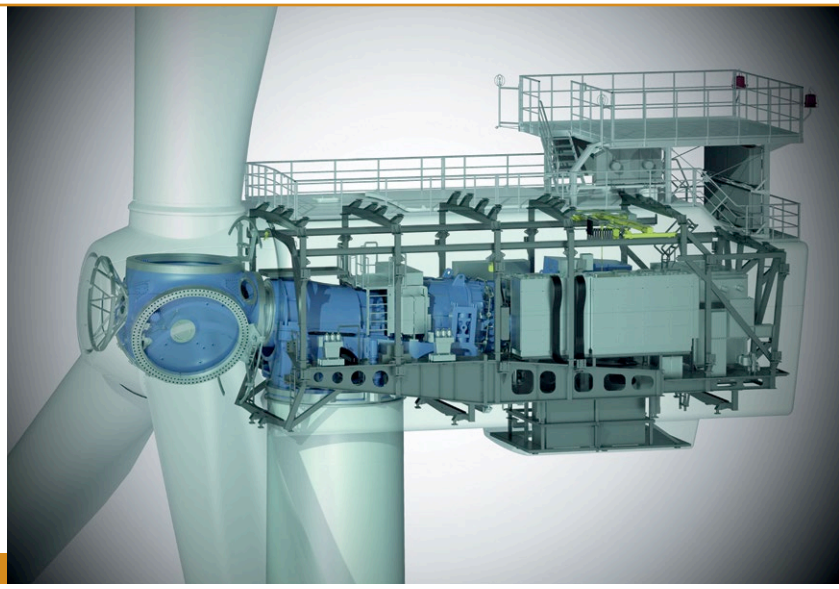
Ulrich Böhm, team leader of development control and drive technology at Scheugenpflug AG in Neustadt/Danube, Germany: "EtherCAT has become established as a global standard, supported by numerous third-party suppliers. Moreover, the installation and electrical connections are straightforward. Another important factor is that the data transmission rates are very high, so we don't have to worry about bandwidth capacity limits. A further benefit is the XFC technology (eXtreme Fast Control), used for very fast and precise tool measurement via the EP1258 EtherCAT Box with two-channel timestamping function."

Further information:
www.pc-control.net/pdf/042016/solutions/pcc_0416_scheugenpflug_e.pdf

Power generation: prototype of 5-megawatt wind turbine installation in China

EtherCAT has proven its value in wind turbines, not only because of the ease with which it handles the long distances between the tower base and the nacelle, which often exceed 100 meters. Also important, according to Markus Rees, Managing Director of aerodyn Energiesysteme GmbH, based in Rendsburg, Germany, are the cabling redundancies and the extensive diagnostic capabilities, which make troubleshooting easy. The combination of all these features delivers consistent high-performance communication capabilities for the core turbine components. Even the wind farm communication can be seamlessly integrated.

Further information:
www.pc-control.net/pdf/032015/solutions/pcc_0315_aerodyn_e.pdf



Packaging: reliable and flexible control of packaging machines

Alois Allgaier, head of the Control Technology Division at MULTIVAC Sepp Haggenmüller GmbH & Co. KG with headquarters in Wolfertschwenden, Germany: "The required communication with the central controller is handled by the extremely fast EtherCAT system, which was also an important aspect when deciding in favor of PC Control. Ultimately, the clock speeds that can be achieved by the packaging machines depend directly on ensuring shortest possible cycle times of the control technology."

Further information:
www.pc-control.net/pdf/special_packaging_2014/solutions/pcc_special_packaging_2014_multivac_e.pdf

Research: drive control for European XFEL X-ray laser

Dr. Suren Karabekyan, research associate with European XFEL GmbH in Hamburg, Germany: "EtherCAT communication is a key component of our facility. It enables us to configure a very robust and reliable control system with redundant ring topology, even in a large installation such as ours. Overall, it is also a very cost-effective solution."

Further information:
www.pc-control.net/pdf/032015/solutions/pcc_0315_xfel_e.pdf

Aerospace industry: self-propelled heavy transporters in construction of Space Launch System by NASA

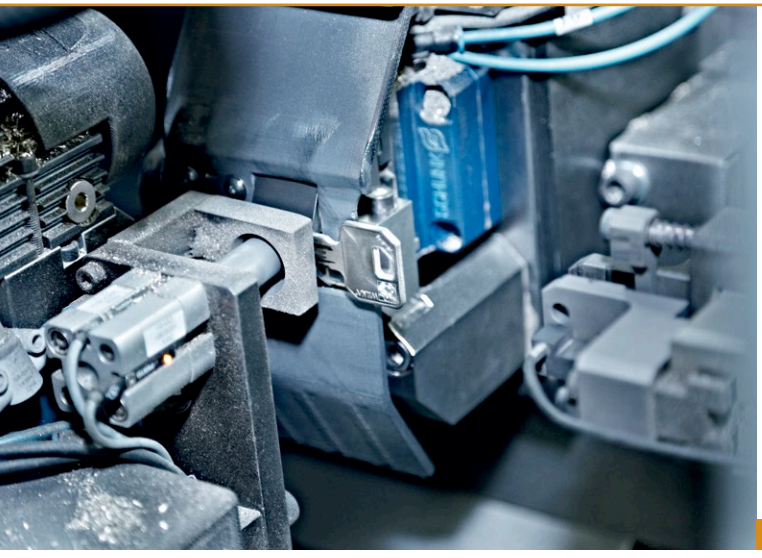
John Pullen, Principal Controls Designer at Doerfer Companies based in Waverly, Iowa, USA: "EtherCAT is also indispensable for fault monitoring. With the built-in diagnostic capabilities of the EtherCAT system, we can immediately point the operator to any specific cable or device in the event of a service or maintenance need."

Further information:
www.pc-control.net/pdf/022016/solutions/pcc_0216_nasa-wheelift_e.pdf

Building automation: revitalization of Frankfurt's Eurotheum high-rise building

Rainer Daiß, Team Manager at Herrmann GmbH & Co. KG in Plüderhausen, Germany: "The huge volumes of data generated – by as many as 100,000 physical data points for the building automation features and an additional 6,000 for the smoke extraction system – require an exceptionally fast and reliable bus system like EtherCAT that can operate over copper wires just as well as over fiber-optic cables, depending on the circumstances. Especially for the highly available smoke extraction system, EtherCAT stands out with its easy-to-implement cable redundancy and fast fiber-optic cable installation."

Further information:
www.pc-control.net/pdf/032018/solutions/pcc_0318_eurotheum_e.pdf



Metalworking: high-precision Wilka key manufacturing

Wilfried Wengenroth, Managing Director of AST GmbH in Wuppertal, Germany: "EtherCAT represents a critical advantage, specifically due to the ability to perform automatic scanning of the system, in particular during initial commissioning. Additionally, EtherCAT offers rapid and convenient diagnostics of all bus devices."

Further information:
www.pc-control.net/pdf/012016/solutions/pcc_0116_wilka_e.pdf

Aviation industry: Rolls-Royce test rig for the world's most powerful aircraft gearbox

Andreas Köhler, Senior Automation Software Expert at Renk Test System GmbH in Augsburg, Germany: "In this application, we benefit from the openness and capabilities of PC- and EtherCAT-based technology from Beckhoff, in particular the high speed, large transmission distances and Hot Connect functionality offered by EtherCAT, as well as the connectivity options for numerous other bus systems."

Further information:
www.pc-control.net/pdf/022018/solutions/pcc_0218_renk-test-system_e.pdf

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Testing equipment: rotary tables and antenna masts in EMC test laboratories

Stefan Lehner, Manager of Software Department at Maturo GmbH in Pfreimd, Germany: "We are optimally supported by the EtherCAT communication standard, which was originally developed by Beckhoff and is now established worldwide. Moreover, EtherCAT is tried and tested as an extremely powerful and easy-to-handle bus system. Via the EL2262 EtherCAT Terminal, we can specify the positions with an oversampling factor of 100 and reach a far higher resolution than would be possible with the underlying control cycle. This is the only way to transfer the required commands to the drive technology at relatively high speeds and with 0.01° resolution."

Further information:
www.pc-control.net/pdf/032017/solutions/pcc_0317_maturo_e.pdf