EMO – World's foremost trade fair for metalworking

CNC control concept with EtherCAT and XFC

Beckhoff will present a new generation of more powerful and price-optimized CNC systems with PC and EtherCAT-based control technology at the EMO 2007. The EtherCAT real-time Ethernet system enables high speed communication between the PC controller and the digital drives. Additional process optimization is offered by the XFC technology, which allows extremely fast, deterministic reactions. In this way, the user is presented with completely new possibilities to improve the quality of his machine and to shorten reaction times.

The world's most important metalworking trade fair, the EMO Hanover, takes place from 17th to 22nd September 2007. Manufacturers from all over the world will present a wide range of machine tools and production systems for cutting and forming processes, as well as precision tools and controllers for the entire production technology.
At the EMO 2007, Beckhoff will present its range of products from the fields of IPC, I/O, Motion and Drives. In the field of metalworking, PC-based PLC, Motion Control and CNC solutions are used, for example, in processing centers and lathes, and in sheet metal processing, grinding, sawing and cutting machines.

In principle, the Beckhoff solution comprises:

- a modern Industrial PC as an open control platform,
- software NC/CNC for Motion Control and interpolating path movements,
- an open, flexible and configurable .NET-based HMI solution,
- EtherCAT as a fast communication medium for I/Os and drives,
- EtherCAT I/Os for high precision control of actuators and fast sensor signal recording, to integrated measurement technology and condition monitoring,
- EtherCAT Servo Drives from the AX5000 series with a corresponding range of motors.

A new generation of Industrial PCs is available for the EtherCAT-based control concept. Instead of additional, expensive fieldbus cards, these IPCs contain two Ethernet interfaces for automation and IT applications. While the 100 Mbit Ethernet port offers optimum performance for all EtherCAT control tasks, a Gigabit port is available for connecting the higher-level network.
The C69xx control cabinet PC series offers a slimline, modern controller platform. The Industrial PCs in robust, ultra-compact aluminum housings are equipped with the latest generation of processors and are optionally available without cooling fans or mechanically moved parts.

Software replaces hardware-oriented controller systems

Besides high-end PCs, the Beckhoff scalable control system with Embedded PCs also offers powerful solutions in the lower price range. One example of this is the combination of a CX1020, Windows CE-based operating system and TwinCAT NC I for interpolating path movements in up to 3 axes. The DIN rail mountable Embedded PCs additionally offer the advantage that the Beckhoff Bus Terminals and EtherCAT Terminals can be mounted directly side by side.

On the software side, Beckhoff offers two solutions for interpolating path movements in the TwinCAT NC I and TwinCAT CNC: TwinCAT NC I is the modular CNC solution for up to 31 channels, each with up to three main and five auxiliary axes. TwinCAT CNC is the classic, powerful CNC application for up to 64 path axes/spindles in up to twelve channels. In addition, this package offers spline and transformation functionality (5-axis functionality) as an option. The basis of both CNC systems is the fast TwinCAT PLC system.

Optimized control and communication architecture

Beckhoff will present an innovation for the metalworking industry at the EMO in XFC technology (eXtreme Fast Control Technology), an extremely fast control solution. XFC is based on an optimized control and communication architecture comprising an advanced Industrial PC, ultra-fast I/O terminals, the EtherCAT high-speed Ethernet system, and the TwinCAT automation software. In addition to optimized cycle time, XFC also offers improved temporal accuracy and enhanced resolution. In this way, the user is presented with completely new possibilities to improve the quality of his machine and to shorten reaction times. Measuring tasks or documentation of parts quality can simply be integrated in the machine control without additional, costly special devices. In the field of machine tools, XFC technology offers the widest variety of applications for process optimization, such as:

- oversampling for structure-borne sound analysis for integrated tool monitoring
- high precision recording of measuring probes
- high mutual synchronicity of axes (important for the precision of interpolating movements)

The main information at a glance:

- EMO Hanover 2007, Germany
- September 17–22, 2007
- Opening hours: Monday–Saturday, 9 am–6 pm
- Beckhoff: **Hall 25, Booth G33**

→ www.emo-hannover.com
→ www.beckhoff.com/EMO2007