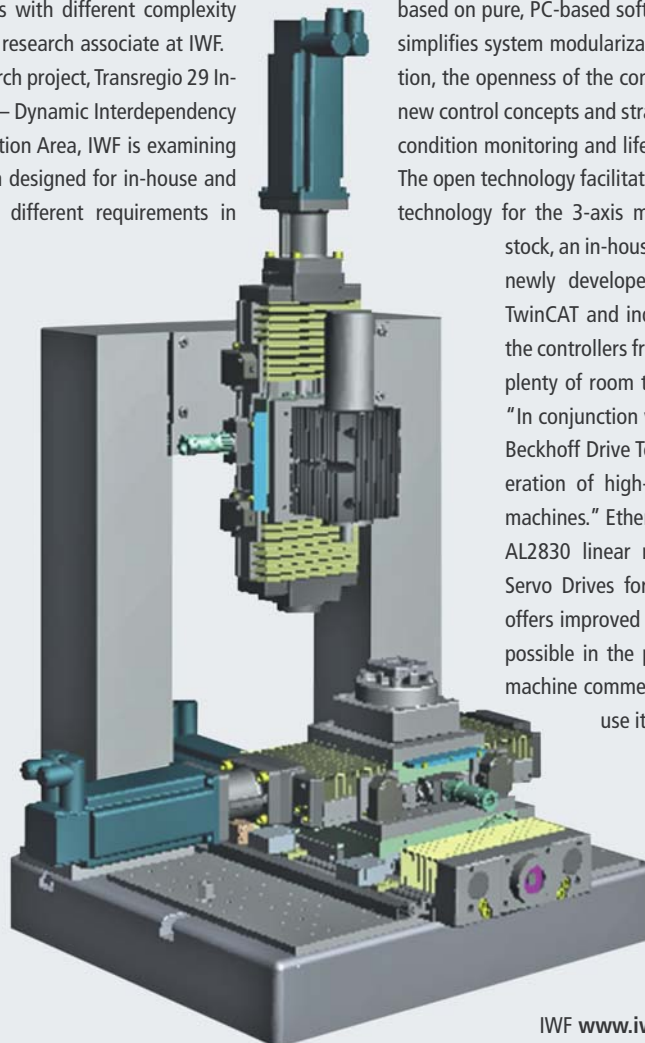


IWF at Technical University (TU) Berlin, Germany, uses PC Control for advanced research projects

The Machine Tools and Manufacturing Engineering department at TU Berlin's Institute for Machine Tools and Factory Operation (IWF) uses Beckhoff technologies for researching and implementing innovative machine tool concepts.

"Beckhoff control technology is characterized by openness, modularity and short cycle times and enables us to create robust and flexible machine tools for high-precision, high-speed production of components with different complexity and size," said Thomas Friedrich, research associate at IWF. As part of the collaborative research project, Transregio 29 Industrial Product-Service Systems – Dynamic Interdependency of Product and Service in Production Area, IWF is examining a modular manufacturing system designed for in-house and service production, resulting in different requirements in terms of system flexibility and robustness. The manufacturing system must enable flexible changeover depending on the type (size, geometry, surface characteristics, complexity) and lot size (single, small-volume production, mass production) of the micro-components to be produced. Flexible configuration requires exchangeable manufacturing process components, clearly defined interfaces and smooth data exchange between the components. "We use control technology from Beckhoff for implementing these requirements.

Open, PC-based control technology enables high-performance, versatile machine tools



TwinCAT CNC is particularly advantageous for this purpose," said Thomas Friedrich. "On the one hand, this tool offers comprehensive CNC functionality for implementing demonstration units based on pure, PC-based software solutions. On the other hand, it simplifies system modularization and interface definition. In addition, the openness of the control platform enables us to integrate new control concepts and strategies developed in-house, including condition monitoring and lifecycle management."

The open technology facilitates the application of Beckhoff control technology for the 3-axis milling machine with adaptive headstock, an in-house development of IWF. IWF integrates newly developed, adaptive control strategies into TwinCAT and individually defines the parameters for the controllers from the TwinCAT library. "This gives us plenty of room to maneuver," said Thomas Friedrich. "In conjunction with EtherCAT and high-performance Beckhoff Drive Technology, we've created a new generation of high-precision, highly productive milling machines." EtherCAT, in conjunction with AL2815 and AL2830 linear motors from Beckhoff and AX5125 Servo Drives for fast, highly dynamic control tasks, offers improved precision and higher speed than was possible in the past. The aim is to make the milling machine commercially available in the long term and use it in-house for education and research.

IWF www.iwf.tu-berlin.de/fachgebiete/wzm/