

AUTOMATICA

Beckhoff at Automatica 2010

The international trade fair for automation and mechatronics, Automatica, presented solutions from the fields of, among others, robotics, assembly and handling from 8 to 11 June 2010 in Munich, Germany. Beckhoff presented its PC- and EtherCAT-based control technology, Motion Control and safety solutions as well as TwinCAT automation software with integrated robot controller. TwinCAT supports various parallel and serial kinematics, such as those used for pick-and-place tasks. A new item presented by Beckhoff at Automatica was the TwinCAT kinematics for 6-D cable robots.

The extension of the TwinCAT automation suite by robot kinematics enables the integration of robots and their interaction and synchronization with the PLC and Motion Control functions. This results in the seamless integration into the overall control system as well as dispensing with additional robot CPUs. The software 'TwinCAT Kinematic Transformation' supports the following kinematics: cartesian portal, shear kinematics, roller kinematics (H-Bot), SCARA, 2-D kinematics, 2-D parallel kinematics and 3-D delta kinematics.

Beckhoff showed a new item in a live demonstration at Automatica: an extension of the TwinCAT software by 6-D kinematics for cable robots. The advantages of the cable robot for pick-and-place tasks result from its mechanical structure: elaborate carbon rods are replaced by economical ropes, the arrangement of the servo motors is flexible (e.g. also underneath the robot) and the workpiece gripper can be rotated and tilted.

EtherCAT – top performance on the basis of Industrial Ethernet

EtherCAT, the Industrial Ethernet system, has now become the process communication standard in many robots. The use of the fast fieldbus system in the field of robotics offers a number of decisive advantages: EtherCAT enables extremely short update times for the process image (50 µs); control loops (up to the current controller) can be closed via the bus. Control of the axes can take place centrally in the controller – including the coupled movement function. The EtherCAT system integrates redundancy, hot connect and hot swap options.

Beckhoff offers an extensive range of EtherCAT I/Os for the connection of the entire sensor and actuator systems into the robotics, assembling and handling technology. A complete range is available for all important types of signals in the EtherCAT Terminals in protection class IP 20 and the EtherCAT Box modules in IP 67. The compact design and small weight of the EtherCAT Box modules facilitates applications in which the I/O interface is moved, e.g. on a robot arm. In both I/O systems the EtherCAT protocol is fully retained down to the individual module, making it possible to realize extremely short reaction times.



Universal high-speed Ethernet: Beckhoff PC- and EtherCAT-based control technology for robotics in handling, production and assembly

As new products in the I/O section, Beckhoff presented, among other things, the HD Terminals – a new Bus Terminal generation with increased packing density. The 'High Density' EtherCAT Terminals contain 16 connection points in the housing of a 12 mm electronic terminal block. Also new are the EtherCAT Box modules with 16 channels, with which wiring and costs can be significantly reduced. The 16-channel box will be available in various input/output versions.

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