

Samsung Electronics Mecha Center selects EtherCAT for ultra high precision motion positioning.

Mecha Center has selected EtherCAT as communication technology for a complex motion control. The EtherCAT networked handling system is responsible for both fast and most accurate positioning in the production processes. EtherCAT is also intended for interlinking various production steps.

The application is most demanding: high handling speed is paired with ultra precise positioning requirements. The substrates are fed by linear motors with 0.5 m/s, and then positioned in the “coarse” stage with an accuracy of 2µm. A second fine stage using a voice coil motor (VCM) is used for final positioning with an accuracy of under 0.1µm. This hybrid stage mechanism has no mechanical coupling between coarse and fine stage, the motion control coordination is solely done by the PC based control system using EtherCAT.

For this application, Mecha Centers Innovative Equipment Technology Research Team implemented EtherCAT in a number of devices, which are intended for Samsungs own use: The IPC and EtherCAT master controls both the linear motor drives and the voice coil motor drives. The laser interface module provides the laser interferometer interface for the fine stage position feedback, whilst the Encoder interpolators deliver the position feedback for the coarse stage. In order to meet the diverse requirements of high velocity and high precision, short cycle times of down to 100µs are employed: the application makes full use of EtherCATs high performance.

Taegon Park, Senior Engineer at Samsung Electronics Mecha Center states: “Mecha Center is dedicated to turning imaginative ideas into groundbreaking technologies that maximize competitive edge in manufacturing leading products. In order to maintain our leading edge, we select the best available control technologies.” His colleague Jinyeong Yun, also Senior Engineer, adds: “Due to its unique combination of high performance, low cost and ease of use EtherCAT is an ideal fit for our demanding applications. Within a short period of time we were able to implement several EtherCAT devices, and we were pleased with the level of support provided by the EtherCAT organization.”

EtherCAT Technology Group

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Martin Rostan, Executive Director of the EtherCAT Technology Group:
“Companies that are technology leaders in their field are always the first to adopt new advanced automation technologies like EtherCAT. Although Mecha Center is only one of several Samsung research centers, Mecha Center’s commitment to EtherCAT is an important sign for this key industry and beyond. It underlines as well that EtherCAT has established itself as an open technology that meets the technical and strategic requirements of leading vendors throughout the world.”

Samsung Electronics Co. Ltd. is a global leader in semiconductor, telecommunications and digital convergence technology. The company manufactures a wide range of products from consumer audio/visual and computer related products, telecommunications, and home appliances to semiconductors and is the world’s largest producer of memory chips, TFT-LCDs, CDMA mobile phones, monitors and VCRs. Established in 1969, today it employs over 120.000 people in 47 countries worldwide. Samsung Electronics Mechatronics Center was established in the early 1980s with a mission to increase production competitiveness as one of the core factors required to be a top world-class company.

EtherCAT is the Industrial Ethernet Solution that convinces equally through performance, flexibility and cost advantages. The functional principle - processing on the fly - makes EtherCAT the fastest system currently available. EtherCAT is an IEC specification and the only hard real time Industrial Ethernet solution that does not require dedicated hardware for the master, but can be implemented in software on any Ethernet controller. EtherCAT is supported by the EtherCAT Technology Group, an international user and vendor organisation with over 200 member companies.

Please send readers' questions to:

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