

# Merger of Drives and Automation

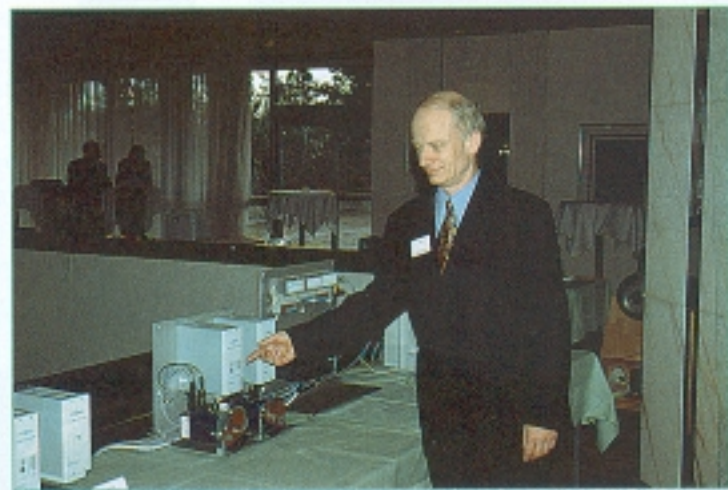
**The merger of drives and automation was the main subject on the occasion of an in-house presentation by Munich-based Maccon.**

Maccon is a recognised specialist and system integrator in drive technology, representing companies like Kollmorgen Seidel, Alxion, ACS, Simec, and Weidmüller. These vendors offer servo systems, direct drives, controllers, and simulation tools and presented an overview on today's technology.

"High-performance motion controllers today are based 99% on PCs with WindowsNT as operating system. The motion controller hardware is based on ISA or Compact PCI, VME is no longer on the market. The state-of-the-art networking technology is CANOpen, DeviceNet will follow", stated Ze'ev Kirshenboim from Israel-based ACS. A powerful servo controller has been introduced with the SB-Family from ACS. This controller offers a dedicated RISC processor for motion control and an integrated power stage. The sampling frequency of 20 kHz and a current control bandwidth of 2 kHz are adequate even for demanding positioning applications. The RISC processor achieves a 23 MIPS performance which is sufficient to execute the two current, velocity and position controller algorithms in 10µs. 40µs still remain per sampling period to handle the other tasks, such as communications, trajectory calculations and the

management of exception conditions. Each axis has its dedicated processor. This controller is also able to manage complete control sequences and machine functions, either stand-alone or under the overall control of a host computer (via RS232/CANbus).

The ServoStar controller from Kollmorgen was speci-



*"The merger of drives and automation is a great challenge", says Ted Hopper, Managing Director of Maccon.*

cally designed for DC-brushless motors. However, it can operate at 650V and covers the power range of 1 to 12 kW (acceleration peaks up to 20kW). The firmware is being extended to offer full local positioning capability. The Maccon-designed Digital Servo Modules are especially suited for volume OEM applications requiring economic but high-performance adaptation of DC- and DC-brushless servomotors in dynamic and accurate motion control applications with power levels up to 3 kilowatts.

But servodrives must com-

municate with each other in order to synchronise multiple axes. As the suitable communication structure today CANOpen leads. "We see a heavy growth of CANOpen especially in drives", says Olaf Gollasch from Weidmüller. "With the CSMA/CA protocol, where CA stands for collision avoidance, CAN is very well suited for decentralised automation architectures, becau-

se the message with the highest priority has a guaranteed access to the bus. And for TCP/IP connectivity gateways like our Dia Control can be used, offering connection to the Intranet or Internet". Kollmorgen Seidel also uses CANOpen, in this case the device profile DSP402. "But we are still working with Profibus for real-time applications with response time requirements in the range of one millisecond, in this case the new P2D protocol. First software has been developed for velocity and positioning", said Stefan A. Geiger. "The mass of users will adopt the-

CANBus as opposed to Profibus and Interbus", says Ted Hopper, Managing Director of Maccon.

An output power of 30 kilowatts can be achieved today with PM brushless direct torque motors, and a positioning accuracy up to 5 arc seconds, which is sufficient for application in printing machines. Other applications include robots and nuclear engineering. "The technology involved in direct drives requires motors with higher torque and consequently bigger size which are hardly adaptable in existing servo systems. So we integrated the position sensor directly into the hollow motor shaft", explained Lois Banon from Alxion/France. The biggest motor weighs 200 kilograms and delivers roughly 30 kilowatts.

In cooperation with the Institute of Electrical Drives at the University of Erlangen Maccon has developed a so-called transverse flux reluctance motor, which promises to be used in the long term in direct drives. "In terms of technical capabilities I can see no difference compared to brushless torque drives", concluded Hopper.

Finally Simec presented a simulation package which allows configuration of even complex drive systems.

**Maccon GmbH**  
Kühbachstr. 9,  
D-81543 München,  
Tel.: +49 89 6512200,  
Fax: +49 89 655217

**SERVICE NO. 4**