Can Stepper Motors Compete with Servos?

ATC News talks to Marc Feyh, manager of stepper products for Parker's Electromechanical Automation Division, about stepper technology.

ATC News: *What's actually new in the technology of stepper motion systems—motors and controls?*

Marc Feyh: Stepper systems continue to decrease in size and cost, which is no surprise to the industry. The expensive, high-end, technically advanced stepper systems don't compete as well with lower-priced servo systems. So the innovation in the marketplace with stepper systems continues to be on decreasing size and maintaining performance for a reasonable cost.

ATC News: *What is Parker doing to meet this demand?*

MF: Our Electromechanical Automation Division is designing the PROstep drive/controller. The PROstep is a miniature microstepping drive with a fully programmable controller and I/O onboard. The mechanical package is small enough to mount directly to the side of Parker's PROmech series of linear actuators to create a miniature-stepper-based automation solution that fits in the palm of your hand.

Parker's PROstep miniature microstepping drive

ATC News: *How can today's stepper-motor systems tackle the intense competition coming from servo motor-based systems that continue to decline in cost?*

MF: It's becoming increasingly difficult for stepper systems to compete with low-priced servos on a price/performance basis; however, there are still two areas where stepper systems clearly win: size and simplicity. Stepper systems are now commonly available in miniature sizes at no additional price premium. Desktop equipment, particularly in the life sciences, often takes advantage of this size/cost attribute. A second benefit of steppers is their open-loop simplicity. If motion control is not your core competency, steppers are simpler to apply and easier to maintain than a comparable servo system. The ease of application and low maintenance requirements translate into additional cost savings in the form of lower total cost of ownership over the life of the equipment.

ATC News: *In what types of applications do stepper motion systems compete most successfully with servos?*

MF: Competition between high-performance steppers and low-priced servos is intense; however, in many applications that don't demand high performance, steppers are still the clear winner. Any point-to-point application in a controlled environment where tight coordination between axes isn't important is an excellent candidate for a low-priced stepper solution. These applications are ubiquitous in the life sciences industry, including moving titer trays between equipment and to and from storage bays.

Another class of applications where steppers compete with servos is in zero-dither applications. "Dither" is a servo system characteristic where a servo motor moves back and forth in small increments (often a single encoder count), trying to settle into a final position. Step motor systems are immune by design to dithering; therefore, for zero-dither applications such as ink jet printing and microscope scanning applications, steppers will provide a better motion solution than a servo system will.

For more information on stepper systems, you can contact Marc Feyh at 707-584-2493 or via email at mfeyh@parker.com.

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