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Precision Control System Uses Trio *Motion Coordinator*

Control Techniques have pioneered a new motor, drive and motion control system which provides substantial benefits to the machine tool sector.



"The exceptional performance provided by Trio Motion Coordinators equipped with SLM Daughter Boards in standard motion control applications can now also be utilised as a very flexible Computer Numerical Controller, " said Muralee Tharan, Senior Development Engineer for Control Techniques Ltd.

Following a long history of close collaboration between the two companies, Control Techniques already had an excellent understanding of the capabilities of the latest range of

motion control products from Trio. Control Techniques, too, has a significant presence in the CNC machine tool industry, supplying a range of drive, control and motor systems to all of the major manufacturers. The introduction of SLM technology offered new opportunities to supply systems with enhanced precision of control and much lower build costs through reduced wiring complexity.

SLM technology was originally developed for use with M'Ax and MultiAx servo drives to provide very high, "at source" feedback resolution of over 8.3 million points per turn, 50 nano seconds synchronisation between any axis, up to 50% less wiring, elimination of the +10V analogue reference signal and local intelligence in the motor.

The company announced a policy of close partnerships with multi-axis motion control manufacturers from 1998. Trio Motion Technology has been an active participant in this partnership, producing an SLM Daughter Board for use with its own range of Motion Coordinators. The Trio MC224/SLM offers 125 μ s position loop control regardless of the number of axes in the system.



On top of the increased performance, one of the aims of the partnership is to provide "Plug and Play" capability to a servo system. Muralee Tharan commented: "It has been proven in

the field that the Intelligent Drive set-up provided by Trio's MotionPerfect software is the simplest servo-commissioning system in the industry".

The combination provided the spur to offer an enhanced system to CNC machine tool builders which would also offer substantial advantages when retrofitted to older machines. The Control Techniques Research and Development Department retrofitted a conventional Arrow CNC milling/drilling machine using MultiAx and an MC224 Motion Coordinator. Accuracy of table movement is assessed using a Renishaw Ballbar® system, which permits the user to capture data to a computer for detailed analysis. The whole procedure, including initial set-up, takes about 10 minutes of machine time. The high resolution feedback combined with full digital interface to eliminate any delays, synchronisation jitters and offsets leads to high dynamic and static stiffness, enabling the system to provide better accuracy and repeatability.

Early tests with a variety of Drive/Motor combinations revealed that under 10µm circularity error can be achieved with virtually no speed reversal spikes at the four points where the table drive motors reverse. Machine tool operators are, of course, familiar with the potential for error which derives from the mechanical and electronic characteristics of the machine, and will take these effects into consideration when programming each component.

Further, the package will be of considerable interest to those who wish to upgrade the performance of their existing CNC machines. "The ease of programming of the Trio Motion Coordinator allows the measured data to be used to compensate for the mechanical errors caused by the wear and tear," said Muralee Tharan. "The installation of a Control Techniques' SLM system means that older machines can be given a new lease of useful life at a relatively low cost, and users will gain from the reliability and ease of use of the Trio controller."