

Control patrol

One characteristic common to CNC and DRO systems is that development continues apace. Steed Webzell assesses the latest innovations

The engineering sector has had to adapt to the UK's higher cost base by using ingenuity and development to produce advanced products and systems which, although they are low in volume, are high in technology and value.

"The most obvious example of this shift is in the aerospace industry, where UK manufacturing has adapted to produce large and high tech parts for the latest range of Airbus aircraft, specifically the challenges presented by the new A380," says Andy Hodgson, business manager, machine tool and motion control, Siemens Automation & Drives. "Such advanced manufacturing technology is spearheaded by Siemens using features such as VCS (volumetric compensation system).

"Aerospace manufacturing in the UK also presents other challenges, one being traceability of the production of components. Systems incorporating industrial PCs, networked and communicating with the plant, are now a basic requirement. Siemens' current CNC systems offer such capabilities together with a full suite of software products under the umbrella of MCIS (Motion Control Information Systems), which incorporate packages such as DNC, Tool Data, Machine Data, TPM and remote diagnostics. These packages also integrate into the Siemens PMS solution offered by UGS," he adds.

According to another CNC giant, Fanuc GE, modern manufacturing is all about offering better performance at a lower price, a philosophy the company has applied to its new Series Oi CNCs.

Compared to earlier models, an

important feature of the Series Oi model C is the higher number of controllable axes. While the Oi-MC milling version can now control five axes and two spindle motors, the Series Oi-TTC turning version can control up to seven axes and three spindle motors.

There are also expanded functions available, such as synchronous/composite control and tool interference check. The composite control software ensures that the tools in use on the two different spindles can exchange position commands. Via synchronous control, the speed of both spindles can easily be synchronised, while the tool interference check is responsible for ensuring that two tools can work on one spindle with collision protection.

GREATER INTELLIGENCE

Imparting more 'intelligence' into CNC machine tools with greater functionality is Yamazaki Mazak's way of offering even higher productivity machining. Easy to operate, intelligent machine tools equipped with the Mazatrol Matrix control are able to react to changes in the working environment to maintain high accuracy and productivity.

Mazak says that the extensive capability of the latest machine tools

makes operator tasks more complex. Additionally, machine tool manufacturers are required to develop machines that incorporate the expertise of experienced machine operators and monitor themselves to realise optimum production and avoid operator errors to overcome human skills scarcity – an issue faced by manufacturers everywhere.

These intelligent machines, or 'i-machines', incorporate intelligent functions: Active Vibration Control for minimised vibration; Intelligent Thermal Shield for heat displacement control; Intelligent Safety Shield for machine interference protection; Mazak Voice Adviser for verbal messages and confirmations; Intelligent Performance Spindle which monitors temperature, vibration and displacement; and Intelligent Balance Analyser which monitors the condition of a machine



table with turning capability.

Like Mazak, Haas Automation has also been working hard to develop its own proprietary CNC system. For instance, common multi-step functions, such as powering up the machine or setting tool offsets, have been reduced to the push of a single button.

Other often-used functions, such as setting part zeros, homing the machine and selecting the next tool during set-up, are also one-button commands.

PROPRIETARY SYSTEM

The Haas Intuitive Programming System is a proprietary conversational operating system that makes cutting parts and creating programs nearly effortless. Using an easy-to-read format with full-colour graphics, the IPS guides the operator through the steps to machine a part.

The operator simply chooses an operation; sets tool offsets, and then enters basic dimension information. Default values for feed per revolution, spindle speed and depth of cut are entered automatically by the control, but can be modified by the operator.

Once all necessary information is entered, pushing Cycle Start performs the operation.

A recorder function allows multiple operations to be recorded and saved, so

'All systems go' for latest DROs

DRO and CNC system specialist ACI (UK) reports an impressive 35 per cent increase in DRO sales in its latest figures (to the end of Q3 2007) compared to the same period in 2006. By the end of September, sales of both the Acu-Rite and Anilam brands already exceeded the 12-month total for 2006.

Managing director Phil Goulding cites strong performances by both the company's distributor channel and its partnerships with importers as reasons for the hike in business. "Also important, our new entry-level Anilam 411 DRO has been very well received," he says, "and the fact that all our DROs are now LCD-based means more and more users are obtaining the benefits of modern technology coupled with powerful functionality at cost-effective prices."

Another new DRO to create a stir in the market is the DP900 from Newall Measurement Systems, part of the €12 billion Schneider Electric group. The DP900 is the company's most powerful DRO to date. Interactive features include dynamic tool position display and 4-axis (linear and rotary) simultaneous readout. The DP900 also includes the ability to associate up to 20 jobs for each function, such as arc contouring, bolt hole (PCD), grid array and many more.

New features specific to the DP900 are centred on the new blue-on-white LCD display. These include a graphical dynamic tool position display, a zero approach graphical display with optional audio alert, a virtual keypad to allow user-defined job names and one-touch help.

that the information can be played back to duplicate the part. Operations that would be difficult or impossible on a manual machine – radii, tapers, profiles, grooving, threading, rigid tapping – are all possible on Haas lathes without knowledge of G-code programming.

Elsewhere, the focus of the new WinMax control software from Hurco is to cut set-up time when programming machines on the shopfloor, and to improve the surface finish of components. WinMax software, which features a new Windows-based interface, is now standard on the control systems fitted to the company's machining centres and lathes.

Existing users will notice the sharp, colour rendered graphics, but this upgrade is far more than a face-lift. The software has more than 25 new and patented features to maximise efficiency and productivity in job shops. 'Swept Surface' benefits mould

tool makers in particular, as it offers a simplified approach to programming and machining complex 3D parts.

'NC/Conversational Merge' enables G-code programs to be called up in the middle of a conversational routine, while a further feature 'Select Surface Finish Quality', allows the machinist to control component quality and run time by adjusting an on-screen slider bar.

SHOPFLOOR PROGRAMMING

"I would say that shopfloor programming is just as relevant today as it was more than 30 years ago when Hurco's founder, Gerry Rock, was first awarded the patents for conversational programming of CNC machines," says David Waghorn, managing director of Hurco Europe.

"This is particularly true in the UK, where we tend to specialise in one-offs and small batch manufacture. Although most engineering workshops have some form of CAD/CAM, the smart ones use shopfloor programming as much as possible for 2D work and save computer-aided procedures for complex 3D surfaces." □

