

Technology under control

Steed Webzell provides a round-up of the latest technology developments widening the capabilities and increasing the operator-friendliness of machine tool controls

Fanuc GE reports its Series 30i and 31i-A5 CNC controllers offer many special functions that facilitate programming and contribute to maximum productivity when performing 5-axis machining.

The controllers support every 5-axis machine configuration – whether swivel head spindle, rotary table or both – offering numerous 5-axis functions, such as manual feed or tool centre point control, tool posture control and tool radius compensation.

Particularly helpful, says Fanuc GE, is tool cutting point compensation. This involves the calculation of the point at which the tool should engage with the material. For tools such as trapezoidal and round edge milling cutters, specific correction values are required that are usually input into the CAM software. With tool cutting point compensation, these values can be permanently saved in the controller and recalled at the press of a button after tool measurement. This simplifies NC programming and allows tools to be changed at short notice.

NEW PLATFORM

Elsewhere, a new platform from Siemens Automation & Drives, called Solution Line, provides scaleable, networked and open automation solutions for a range of applications. Solution Line comprises the Sinumerik 802D and 840D as a drive-based CNC control, as well as the Sinumerik 840Di as a PC-based version.

The Sinumerik 802D is an operator panel-based control that combines the NC, PLC and HMI (human-machine interface) in a single unit. It can control up to five axes (two of which may be

spindles) and is suitable for low and medium range milling and turning machines. The Sinumerik 840D is a distributed, scaleable, open and inter-connecting system that offers many functions and can be used for up to 31 axes, while Sinumerik 840Di is a fully PC-integrated NC system for up to 20 axes.

Another CNC specialist with a radical new CNC platform for machine tool manufacturers is NUM. The Flexium modular platform is claimed to offer

unprecedented scalability that can be applied economically on a machine with a just a few axes, or as many as 200. This facility is combined with open programmability that gives users complete freedom to customise the HMI.

At the heart of the new platform is a new CNC kernel that is at least four times more powerful than the fastest version of NUM's existing Axiom controller. Two versions of the CNC kernel are available, Flexium 6 and Flexium 68. The former is a



Heidenhain iTNC 530 is used by Winbro on machines that drill cooling holes in turbine components

On-machine programming strength

Half of the contracts received by Tenby-based sub-contractor Bartlett Engineering require reverse engineering. Examples include replacement parts for use in petrochemical plants, most of which were originally manufactured overseas. Measurements taken from component samples are used to make drawings from which the CNC machines are programmed by manual data input on the shopfloor using Hurco's MAX conversational control system. All programming is done this way, as finding staff in Pembrokeshire with G and M code skills is very difficult, says the company.

Following the launch last year of the updated Windows-based software, Winmax, the MAX control on Bartlett's VMX60 VMC has been upgraded. Benefits are that it has made programming simpler and 20 per cent quicker, while the 3D colour graphics are improved.

Elsewhere, an XYZ ProtoTRAK plus BobCAD/CAM produced program combination is cutting production times at Allmond Custom Cycles by two-thirds or better, one example being the set of fork yokes machined on the company's XYZ SMX 2000 turret mill. The company

builds one-off custom bikes. The XYZ-supplied BOBCAD/CAM system allows a basic machining program to be constructed quickly with ProtoTRAK then allows easy tweaking at the machine for Allmond. (See also page 38)



compact, cost-optimised solution for stand-alone machines with up to five axes of motion, while the more powerful Flexium 68 will handle up to 32 interpolated axes, divided into as many as eight co-ordinated groups. If more axes are required to support very large equipment projects such as a multi-cell production line, then Flexium 68s can be interconnected using real-time Ethernet.

But it is applications where a control's capabilities show themselves. Coalville-based Winbro Group Technologies specialises in the design and supply of high performance laser and high speed EDM systems to turbine manufacturers. Two recently completed machines – a Delta Laser and a high speed EDM drilling system – are both equipped with Heidenhain iTNC 530 digital drive control systems and are capable of the precision drilling of cooling holes in turbine components for aerospace engines.

In both instances, drilling of components takes place at a late stage in the manufacturing process, when components have a very high value-

added content and machining errors could be extremely costly. The resulting emphasis on extreme accuracy in terms of both the geometry of each hole/feature and its precise location on the surface of the component, which is a prerequisite for producing the correct flow pattern and desired cooling effect, is a major influence on the decision to equip Winbro machines with Heidenhain iTNC 530 control systems.

SIGNIFICANT MARKET

But there is still significant market for 2-/3-axis systems, a fact confirmed when RK International Machine Tools walked on to the Anilam stand at April's MACH exhibition and ordered seven Anilam Series 3000 and an Acu-Rite MillPwr CNC to be used on its Europa Milltech 5000 turret milling machines.

The 2-/3-axis Anilam Series 3000 CNC features the Machinist language coupled with a wide range of standard and advanced cycles including ellipse, spiral, helical, tapping, irregular pocket milling and profile milling, as well as special

cycles such as counterboring.

Also at MACH, Gate Machinery sold two PBM-2000 turret millers and a pair of G-330E high speed toolroom lathes to Derby-based technical training company Training Services 2000 – all equipped with the new Anilam Wizard 411 DRO.

The Anilam 411's 1-/2-/3-axis 'entry-level' DRO standard functionality embraces tool offsets, sub-datums, linear patterns (row, frame, array), PCD calculations (full and partial) and vectoring, along with an LCD screen and canned functions for incline, arc, and rectangular frame and pocket routines.

Another new DRO attracting attention is Newall's DP900 for manually operated lathes and milling machines. Newall's most powerful DRO to date, it features a white-on-blue LCD display, geometric functions with probe capabilities, graphical dynamic tool position display and 'feather-touch' cap-sense keypad.

Interactive features of the DP900 include dynamic tool position display and fourth axis (linear and rotary) simultaneous readout. □