Big issues move on

EACH YEAR, THE PPMA SHOW PLAYS HOST TO DISPLAYS BY ENGINEERING COMPONENT SUPPLIERS, AND A VISIT TO SOME OF THESE IS PERHAPS THE BEST WAY TO IDENTIFY IMMINENT AND MEDIUM TERM TRENDS IN MACHINE BUILDING TECHNOLOGY. THE BIG ISSUES OF ONE YEAR ARE QUICKLY REPLACED BY THOSE OF THE NEXT. BY BOB DOBSON.

In the world of engineering design some themes seem to recur year after year. To the layman this may suggest that there is no development – that the relevant technologies are not advancing. But these are in fact the big issues that design engineers are addressing, the cutting edges where technology is advancing, the moving goal posts where it is difficult to score but fatal not to.

Over a number of years each theme will resolve itself, but invariably it will be replaced by another.

For instance, open communications using fieldbuses was a hot topic for the best part of a decade but there was barely a mention of it at this year's exhibition, indicating that the technology has matured and that users are comfortable with its implementation.

In its place, safety has risen to the fore again, as has cost control of the design and engineering functions and reduced cost of ownership through better information, increased integration and reduced maintenance.

Issues such as these can be dry, abstract and uninspiring when simply spoken about, but seeing the advances on moving displays and talking to the real experts who man the stands can really bring home ideas and lead to solutions to problems that may otherwise seem intractable. Thus making the effort to spend a day at the NEC is usually repaid quickly and generously.

PPMA show stalwart Lenze showed solutions to several current issues on its stand. On safety it noted that the European Machinery Directive requires machine builders to ensure that set-up, operation and maintenance have to be achievable without endangering health or compromising safety. For drive systems this means protection from moving parts.

Its new L-Force Highline servo drives include on-board safety modules, which incorporate 'safe torque off functionality', dedicated connection to safety sensor systems, monitoring of the connection and safe stop function. The modules plug into the drives and can be swapped out in seconds should the need arise to change them.

Other features and functions can also be added to the L-Force drive via a range of plug-in modules, so allowing the drive to be completely personalised to its duty. Modules are available for various communications options, analogue and digital input/outputs for systems connection, LEDs for diagnostics, USB adapters for PC connection, resolvers and other feedback devices, sensors, failsafes, and so forth.

Should the duty change the drive can be reset simply by replacing appropriate modules. Similarly, a failed module can be stripped out and replaced. Thus the costs associated with initial set-up, maintenance and resetting for new duties can be reduced significantly.

Simplify design

The need to reduce build costs has also had motion control specialist Quin looking for innovative solutions. This company was a pioneer in motion control 20 years ago and has always kept itself at the cutting edge of the technology with a steady stream of advances. But it was never a bunch of boffins working in an ivory tower – it always kept its feet firmly in its customers engineering offices and let the market shape its future.

For many years it made a comfortable living by simplifying machine design, doing away with gearboxes, clutches, driveshafts and much of the mechanical paraphernalia that used to define machine building, and replacing them all with direct drive servos. The operation of these could then be co-ordinated through Quin's motion control technologies.

At a previous PPMA show Quin surprised many of its competitors with its latest development. Rather than the expecting electronic wizardry and powerful software, Quin instead launched a mechanical product! This was a case packer. Sleek, powerful and flexible, it embodied the principle that Quin's designers held dear of using servos to simplify operation.

Bespoke drive: *New servo drive from Lenze can be customised in seconds with plug-in modules*

Quin had taken the view that many machine builders were moving from their mechanical heartland into Quin's drives and control territory, and they could reverse the trend. The case packer was an immediate success and went on to found a whole new market segment for the company. This initiative was complemented this year with the announcement that Quin has formed a partnership with Endoline the case erecting, packing and closing specialist.

Development efforts have now turned back to motion control technologies, so Quin offers a full suite of up-to-the-minute products including servos and drives, communications, software, operator interfaces, positioning slides, gearheads, and linear motors.

The big crowd puller of this year's PPMA

stand was its latest development in motion control programming, Quin Logic Control (or QLC). This takes the company's powerful motion control programming language, with many built-in functions, and integrates PLC functionality that meets the IEC 61131-3 standard. The result is a cost-effective solution for the machine-builder, avoiding need for an external PLC for local machine sequential control.

In keeping with Quin's design philosophy of true distributed control, functions are located locally within each axis rather than in a central controller. This allows for virtually unlimited expandability with no need to add ever faster central processors that require ever higher network bandwidth to each drive.

Sick was using its stand to showcase what it claims is the world's smallest safety laser scanner. Its new S300 generates a protected field radius of up to 2 metres, through a 270deg arc, and is expected to find applications in working areas within machines, production lines, robot cells, vehicles, storage facilities, and the like.

The S300 works by constantly scanning a laser through the area being protected. During set up the unit 'learns' the position of fixed objects and also the range of moving objects, so that during subsequent scans it can recognise additional objects and, if necessary, raise the alarm. Despite being small and lightweight (102 x 152 x 105mm and 1.2kg), it is as fully featured as Sick's workhorse S3000 scanner, meeting all up-to-date standards and able to communicate over a safety fieldbus.

Information for operators: *Monitor panel from the new Pro-face AGP 3000 series*

Information needs

Machine designers now understand that clear and timely information is vitally important to operators, which has led to the proliferation of human machine interfaces (HMIs) or graphic display panels. These can be positioned at critical points around a machine or plant and provide on-the-spot information about virtually any aspect of the machine and its performance.

They can process raw data into useful information in the blink of an eye, and present this in the most appropriate way – as a message, a value, a graphic, a video or an alarm.

Pro-face's new AGP3000 series of HMIs breaks new ground on several fronts, with the 50 model range categorised into three classes:

- M (multimedia) class that enables recording/playback of video footage. This, says Pro-face, is an industry first and will find uses in many areas. One such use is in a food factory where visual product appearance is absolutely critical, another is the hygienic industries where manual checking can be automated with a video feed to one or more HMIs.
- C (control) class that enables some control previously undertaken by a separate PLC to be brought on-board the HMI using expanding I/O capability.
- S (standard) class, which has new functions in addition to the specification of current models.

A third company demonstrating a field device with on-board PLC capability was inverter manufacturer Control Techniques. The onboard PLC feature of its new Commander SK series of general purpose drives is said to save machine builders money by removing the need for an external PLC and power supplies, while integrated fieldbus options minimise the need for external I/O to interface with the drive. The saving in control panel space alone can be significant in jobs of all sizes.

Marlin Stainless, a division of AEG, was celebrating its first year of business at the PPMA Show, having launched itself at last year's event. Its core products are stainless steel washdown and clean in place motors and gearboxes that ease maintenance duties in clean and hygienic industries and thus help contain running costs.

The Marlin stainless motor has an IP66 rating that permits high-pressure hose wash downs, which is much quicker than brushing, and a smooth body with round terminal box that have no awkward angles or crevices to trap debris or breed germs. Further, there is no motor plate to catch food because the motor information is etched into the body.

Being a standard IEC metric unit, it simply drops into place when used to replace a standard motor. Marlin motors are offered in power ratings of 0.18-7.5 kW in metric frame sizes up to 132 as TEFC machines. Smaller units (up to 0.75 kW) are also available from 63 frame size as TENV machines. ■

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