

Parts of the future

CONTROL SYSTEMS AND MACHINE COMPONENTS AT THE [PPMA Show](#) HELPED GIVE A PICTURE OF FUTURE PACKAGING MACHINE DESIGN. SIMON MARSDEN* MAKES THE FIRST OF TWO REPORTS.

Motion control and drives

ELAU

Integrated motor/drive unit suits rotary table machines

The new Elau PacDrive SCL-055 integrated servo motor/drive system – SCL stands for Servo-motor Capping and Labelling – is aimed at reducing development times and easing machine layouts, with the motor and drive integrated in one enclosure to reduce cabling and therefore costs.

The SCL-055 is ideally suited for direct integration into rotary tables – such as those seen in a number of liquid packaging applications – where physical constraints have traditionally placed limitations on drive system design and layout.

Protection is taken care of using a special Hart Coat surface treatment and the unit is rated to IP67, enabling it to be used in aseptic filling applications where liquid intrusion and corrosive chemicals are found. Additionally, the motor has reinforced bearings capable of handling greater than normal radial loads, and so can be directly coupled with a belt drive.

Multiple SCL-055 servo drives can be controlled using Elau's PacDrive controller which combines motion control with machine logic in one control platform. By reducing the number of hardware and software interfaces, Elau claims that



Integrated motor and drive: Elau PacDrive SCL-055 suits rotary tables

increased performance and operational efficiency can be achieved, as well as improved regulatory compliance, specifically where pharmaceutical packaging machines or processes need validating to FDA standards.

Additionally, "third generation" machinery designs that integrate servo control systems with open systems architecture standards – such as IEC 61131-3 and PLCopen – allow pre-tested software libraries with compliant function blocks to be included to simplify any validation processes.

In the UK Elau is represented by Intelligent Motion Control.

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B & R INDUSTRIAL AUTOMATION

Single compact unit provides machine control and visualisation

On a similar theme, B&R Industrial Automation's latest range of

Power Panels are designed to provide complete machine control and visualisation in a single compact unit. This significantly reduces complexity, cost and the development time needed for control systems.

B&R's Power Panel PP21 and PP41 units are available with text or graphic displays. They include an onboard PLC controller with built in inputs/outputs and expansion slots for optional input/output expansion. Both are aimed at small to mid-sized machine control applications.

PP100 and PP200 units are designed for more demanding applications, either standalone or as part of a networked system. Using open standard operating systems they have a wide scope for control – whether it be machine control and visualisation using Windows CE, or complete automation with integrated control and drive technology over a network.

Also from B&R were open-architecture industrial PCs and embedded PC-based automation products.

Programming for B&R hardware is based on the company's Automation Studio, a Windows based software tool, providing the means to develop control, motion, visualisation and communications.

For applications needing high-speed data transfer the Ethernet Powerlink is a deterministic networking package aimed at industrial control applications. With communications and control

functions running on the same bus systems, wiring and maintenance is simplified and based on IT standards.

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LENZE

General-purpose drive can be configured via removable chip

Lenze's new SMD low cost ac inverter is a general-purpose drive offering power ratings from 0.25 to 22kW, with input voltages of 200/230V on both single and three-phase, or 400/480V three-phase.

A removable chip on its front panel – called EPM – contains the entire drive's configuration and motor parameters. Using an EPM programmer, new configurations can be downloaded onto these chips for shipment to the end user, effectively providing world-wide support.

Integral to single phase SMD drives is an EMC filter, a footprint filter being used on three-phase variants.

A number of configurable control inputs and outputs are also present on the drive.

Other motion control products from Lenze included their range of servo motors, drives and controllers. Here the 9300 range of controllers has application-specific software options allowing cam profiling, registration or positioning. The 9300 also includes PLC functionality and is programmed using IEC 1131 language.

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QUIN SYSTEMS

Four-axis closed loop position controller

Quin Systems' Q4 Control is a four-axis closed loop position controller, including an optional fifth input for use as a master encoder. The unit includes a number of digital and analogue input/outputs, with options to expand if required.

Also included are RS232/485 ports for programming and operator interface communications, CANopen, and Quin's own network SERVOnet, for connecting to drives or other controllers. A TCP/IP Ethernet port provides the interface for programming, on-line data access and diagnostics.

Options also exist for Profibus, DeviceNet, Interbus S, Modbus and DataHighway.

Developing Q4 motion control applications takes place under Quin's universal PTS (Programmable Transmission System) software. This is a Windows based package that incorporates motion diagnostics, configuration and tuning.

PTS also allows motion profiles to be designed and visualised in terms of position, velocity, acceleration and rate-of-change of acceleration.

Included is a large library of standard machine functions, such as registration and more complex algorithms.

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CONTROL TECHNIQUES

AC drive system uses smartcard to aid set-up and maintenance

Control Techniques' new Unidrive SP (Solutions Platform) ac drive system has been designed with

performance and flexibility in mind, and is capable of performing V/f, open and closed loop vector, servo and regeneration operations. It can be configured for 14 different feedback signal devices as standard and in power ranges from 0.75kW to 30kW with input voltages from 200V to 690V.

The Unidrive SP uses a range of SM (Solutions Modules) that clip into the drive.

These application-based modules provide encoder feedback, i/o, and PLC control, along with fieldbus interface modules. Up to three SM modules can be installed in the drive.

An integrated EMC filter meets the requirements of EN 61800-3 and a "Secure Disable" (SD) function is designed for inclusion into machine safety systems to comply with EN954-1 category 3, required for the Machinery Directive.

A memory card can also be plugged into the front of the drive to aid set-up, commissioning and maintenance. This smartcard can be programmed remotely from the drive, the programme being transferred once the card is inserted into the drive.

No on-board programming keypad is fitted as standard. Instead, a number of programming options are offered including an LED keypad, a remote LCD keypad and via a PC using the drive's Modbus port.

This third option enables programming and interrogation of the drive, the smartcard, LCD keypad, the encoder set-up and any installed SM applications modules.

Additionally, if the drive is part of a CNet based network, users can view and access other drives on the network remotely in real time.

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