MOVI-C: the all-in-one modular drive automation solution



ith a long history of developing drive-train and motion control solutions for processing and production applications, SEW-EURODRIVE's new MOVI-C® suite of modular products solidifies the company's claim to be an all-in-one provider of drive automation solutions.

"Globally, starting from simple motion control using our SEW-motors, gearboxes, gearmotors and inverters/variable speed drives (VSDs), we have steadily become a competitive automation provider. With the upgraded MOVI-C range, we can now offer better than ever capabilities to control the speed, acceleration, position and torque of multiple motor-driven axes of control systems - with excellent resolution," explains Dylan Enslin, SEW EURODRIVE's MAXOLUTION engineer.

"In addition, the accepted safety norms to meet industrial regulations have all been embedded into the MOVI-C's modular suite of products, which includes a complete range of VSDs, controllers (PLCs),

MAXOLUTION engineer Dylan Enslin of SEW EURODRIVE SA introduces the new MOVI-C[®] range of drive automation solutions, which is now available in South Africa and will soon be one of the key product lines to be locally assembled in the company's Aeroton premises in Johannesburg.

digital interfaces (IOs), software and pro- in encoders and diagnostic units provide gramming solutions, along with the gearmo- the finishing touches for this wide-ranging tors and servomotors that physically move portfolio. modern automated machines," he continues.

offering, Enslin says that fit-for-purpose solutions can be implemented for single- or multi-axis applications: for particularly complex motion control applications: and for customised machines such as robots or factory production lines. "MOVI-C® is ideal for optimising or expanding existing automation systems or for rapidly implementing new automation projects where flexibility, rapid deployment and cost-effectiveness are key," he says, adding that the range offers everything needed from a single supplier.

The end-to-end MOVI-C solution from SEW-EURODRIVE includes planning, commissioning, operation and diagnostics software; all of the electronic drive control and monitoring devices; and all the mechanical drives and gearmotors. This enables the system components to be fully integrated to achieve the machine control required and the range offers complete freedom when it comes to the communication – from PROFINET and Industrial Ethernet to Modbus.

Find the right drive technology

The MOVI-C modules that make up a system are designed to directly suit drive automation applications from simple to very complex. The SEW range includes gear units for standard and servo applications that come in different sizes and with different outputs, speeds, torques, designs and varied

finishes, all combined with asynchronous or synchronous (servo) motors. Linear motors, electric cylinders, brakes,

"For single-axis automation such as Describing the modular nature of the conveying," Enslin explains, "MOVI-C [®] inverter technology or the newly developed MOVIDRIVE application inverters can be coupled with MOVIMOT[®] flexible mechatronic drive systems. These can be connected to a higher-level master MOVI-C[®] CONTROLLER via a fieldbus interface. Alternatively, the MOVI-C master controller can be used to directly synchronise all of the MOVIGEAR® systems on the conveying line, which each have its own built-in VSD," he says.

> For programming the VSDs, he says that predefined MOVIKIT® software modules enable parameters to be entered via a graphical interface to quickly and easily set up the output motion control required. Each axis can be controlled individually via the network controller and data is stored on a memory card in the integrated or decentralised VSD units.

> "There are many applications for singleaxis automation solutions, from mixers, pumps and fans to a host of conveying and product transfer operations where regulation of the speed, acceleration and torque of the drive motor may all come into play.

> He describes a simple nut fastening machine for an assembly plant. "Initially, the speed can be high to reduce the time it takes to thread the screw onto the stud. But as soon as the nut begins to tighten, the system switches over to torque control, stopping the motor as soon as the pre-programmed ideal torque is reached," Enslin explains.

For motion control involving multiple decentralised axes, such multiple column hoists, robots and manipulators with auxiliary axes, each axis will typically be driven by its own MOVIMOT[®] mechatronic drive system, with all the necessary decentralised peripherals such as position and speed sensors. These will be linked to a MOVI-C® CONTROLLER via EtherCAT[®] or SBusPLUS to achieve real built- time synchronisation.

> The MOVI-C[®] CONTROLLER may also receive setpoint updates for single-axis or coordinated positions/motions from a higherlevel master controller via the fieldbus.

Predefined MOVIKIT[®] software modules can again be used to implement the motion control drive functions for many kinematic scenarios that cover a large percentage of typical automation requirements - and if needed, new kinematic functions can be custom-written by SEW-EURODRIVE.

"For higher level and customised programming, we have MOVISUITE® engineering software, which runs on a laptop and covers commissioning and all aspects of the motion control in operation as well as diagnostics," Enslin points out. "The MOVISUITE® user interface is easy to follow, intuitive and self-explanatory and all the components in a MOVI-C[®] automation system, from inverters and controllers to motors, gear units and drive systems, can be configured, commissioned and monitored, end-to-end, using this software," he says.

For module automation, such as packing and processing machines and complex transportation tasks, all the drive functions for the motion control topology are available. Graphical editors can be incorporated to manage drive functions and the automation tasks can be managed and allocated from a higher-level master MOVI-C CONTROLLER, or implemented in part or in full via MOVIKIT.

EtherCAT[®] devices can also be integrated, either centrally or decentralised, along with the MOVIGEAR, MOVIDRIVE or MOVIMOT drives and inverters, while the use of MOVISUITE engineering software makes programming quicker and simpler.

The common EtherCAT protocol also

"Our MOVI-C is available with the EtherCAT CiA 402 Common interface, which is used by many leading global OEMs for their VSD Interfaces. This is a standard interface for communication between controllers, VSDs and other connected devices. It gives our new MOVI-C range plug-and-play compatibility with other drives and PLCs on customers' sites, enabling us to swap out existing drives for MOVIDRIVEs or to retrofit or extend a drive automation system without having to replace all the system components," says Enslin. enables motion-slave type applications to be implemented using MOVI-C devices. These involve series-integrated machines on a production line, with numerous axes and kinematic calculation being performed by higher-level PLC controllers.

The CiA402 profile enables MOVIDRIVE®, MOVIMOT[®] and MOVIGEAR[®] systems to be connected directly to a controller via the integrated EtherCAT interface. This makes integration into higher-level controllers particularly quick and easy because extensive conversion work is not required.

On the energy efficiency side, Enslin notes the particular advantage of decentralised drive solutions using the MOVIMOT gearmotor with its built in inverter. "On a long conveyor with 45 gearmotors, the control panel can be a kilometre away from the furthest gearmotor, so if the MOVIDRIVE VSDs are all in that panel, the VSD power losses are significantly higher. With the mechatronic



provider of drive automation solutions.

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MOVIMOT units, these losses are significantly reduced

"Energy efficiency can be further improved by adopting our new IE5 servo gear units, which not only offer the highest efficiency available, but their speed can also be very accurately controlled without the need for encoder feedback," Enslin says.

As with many SEW-EURODRIVE solutions, the MOVI-C modular range has been developed for easy customisation of customer-specific automation needs. "We are currently bringing in component stock to assemble MOVI-C units at our new Aeroton facility. We have built a clean electronics assembly area behind closed doors with copper grounding and anti-static mats to assemble our VSDs. Movigears and Servo Motors, which are currently only assembled Cape Town, will also be assembled and repaired on the main floor of the new Johannesburg facility. The assembly rooms are antistatic, dust free electronic assembly rooms.

"Because a large portion of our product range was developed in cooperation with one of Germany's prestigious automotive OEMs, we are listed as one of their global best-practice suppliers. We are already quoting on systems for a local assembly plant here in South Africa and we hope this success will trigger enquiries from many more local systems' integrators and plant automators," concludes Enslin.

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