Motion control engineering partnership in the Covid crisis and beyond

Throughout the Covid-19 pandemic, OEMs have been challenged to provide solutions from design adaptions through to completely new machines. Particularly in the medical field, many of these machines rely on high accuracy, meaning high demand on servo system design. In addition to providing a precision motion control capability, reliance on holistic engineering partnerships have been brought to the fore.

Gerard Bush, INMOCO, explains the need for a collaborative approach in motion control development.

The Covid-19 crisis has increased demand across a wide variety of medical sectors, not least imaging and diagnostics. As a result, CT (computerised tomography) scanners, used in the diagnosis of conditions impacting the lungs and circulatory system, among other organs and biological processes, have been heavily relied on. As a result, the motion system on which CT scanners are based, being integral to provide control accuracy, have also faced a strong requirement.

A CT scanner generates a 3D representation of the body by taking a wide series of X-ray images from a range of angles surrounding the patient. To optimise the patient outcome, the key attribute of a CT scanner includes high image resolution, where the more detail and clarity that the scanner presents, the higher the potential of analysis and diagnostics by the medical practitioner. This capability is the result of the speed and accuracy of the scanner's servo drive and motor control, and the servo package also has to combine control precision with speed of operation in order to minimise the time the patient is subject to the X-ray procedure.

Precision motion control

To achieve these benefits, a medical imaging OEM partnered with Kollmorgen for the supply of its servo drive, motor, cable and supplementary motion control equipment. The AKD servo drives form the basis of precision motion control and are selected by the CT scanner OEM as a result of their high bandwidth torque and velocity loops, combined with real time performance feedback.

The servo drives are matched with the AKM servo motor that offer low cogging to provide smooth and controlled motion, required for precision across multiple X-ray frames per second. High motor power density also ensures a more compact footprint for a smaller overall machine.

Ease and speed of motion application development and programming is also crucial for a faster time to market – especially crucial during the peak demand that the Covid crisis has presented. Combined, drive and motor compatibility ensures fast and reliable integration, which is made easier thanks to the simple to operate graphical user interface and wizard-based autotuning.

Motion solution specification assistance

As part of Kollmorgen's global service, its capability is supported locally by country-based distributors and solution partners. In the UK, INMOCO, a motion specialist, supplies and supports Kollmorgen's products to OEMs, advising on a variety of aspects to facilitate effective machine design. Based on an OEM's known specification needs, INMOCO can guide engineers through product selection combined with Kollmorgen's selection tools.

If specification criteria for application requirements, such as torque and speed, are as unknown by the OEMs design engineers, INMOCO can provide an OEM with servo sizing along with a detailed review of all potential application design aspects. This service extends through to a co-engineering capability, where INMOCO's engineers will interface directly with the OEM and Kollmorgen to develop the optimum motion package.

This could range from identifying aspects such as voltage requirements and the windings best able to suit application needs, through to calculating servo braking speeds. Machine design is also assisted with Kollmorgen's 3D image CAD library, which serves 50,000 product options for fast and simple motion solution integration within the overall machine.

Engineering partnership

If the partnership needs to extend further than the motion solution surrounding the motor, INMOCO can also work alongside Kollmorgen and the OEM to focus on software application development for the motion solution. This could range from programming motion profiles across the machine, through to the integration of third-party devices. These solutions may also require start-up assistance, including commissioning and on-site debugging, through to full training and ongoing field support.

The covid pandemic has brought to prominence the need to adapt or build new machine designs at a time of crisis. The reality however is that in general, OEMs typically benefit from a level of service above simple hardware procurement, whether to achieve faster time to market or an improved machine design. From servo sizing through to full application development and ongoing support, machine builders are increasingly relying on the presence of partners in engineering.

About Kollmorgen

Kollmorgen has more than 100 years of motion experience, proven in the industry's highest-performing, most reliable motors, drives, linear actuators, gearheads, AGV control solutions and automation platforms. Kollmorgen delivers breakthrough solutions that are unmatched in performance, reliability and ease of use, giving machine builders an irrefutable marketplace advantage.

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About INMOCO

Established in 1987, INMOCO now offers an extensive range of motion control equipment including: compact servo amplifiers, position controllers, stepper motors, PLC controllers, linear motors, sensors, electric actuators and gearheads. INMOCO's product portfolio is supported by extensive applications and technical expertise, in addition to customer-specified electro-mechanical development and sub-assembly services; including calibrating and testing in a class 10,000 clean room facility.

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