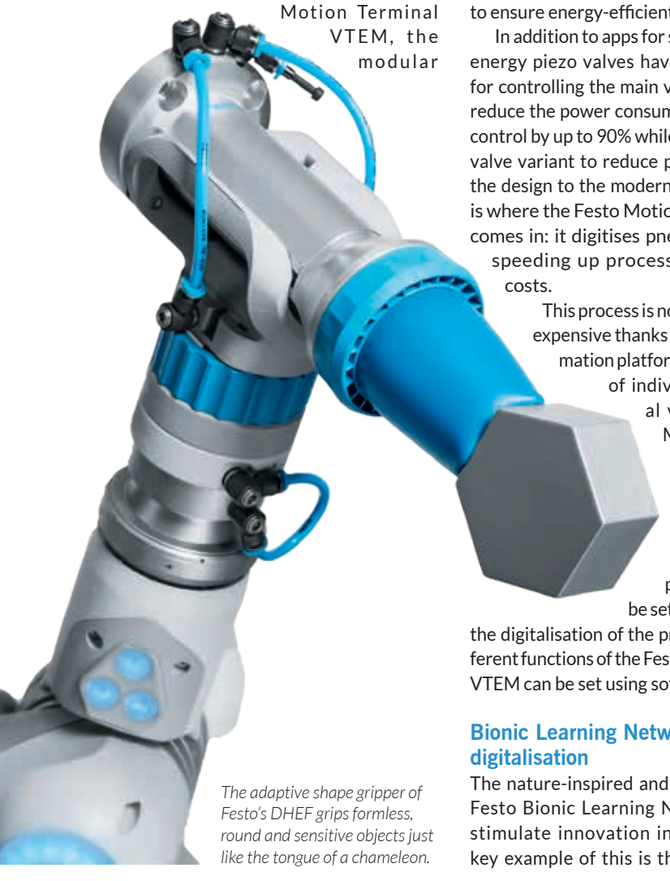
Higher productivity through digitalisation

"At Festo, Industry 4.0 is more than just hype," says Adrian Bromfield, head of the Industry 4.0 campaign at Festo. In this article he outlines why he can make this claim and some of the technologies and initiatives that are being rolled out.

As the world is at the brink of another industrial revolution, Festo has adopted several integrated approaches to grasp Industry 4.0 in the world of production. These approaches incorporate the interaction between people, technology, training and education. Since the introduction of Industry 4.0, Festo has launched a variety of solutions and technologies for the future. Festo uses these products and solutions to increase customer's productivity in the workplace, create a positive shift in the economy as well as modify workplaces.

"At Festo, Industry 4.0 is more than just hype as it is backed up by specific products and projects," says Adrian Bromfield, head of the Industry 4.0 campaign at Festo. "Our Motion Terminal VTEM, the modular control system CPX-E, Bionic Learning Network solutions, and the Festo App World which inspire innovation in digitalisation, CP factory as well as Industry 4.0 courses offered by Festo all reflect that Industry 4.0 is already here and being implemented," he adds.



The adaptive shape gripper of Festo's DHEF grips formless, round and sensitive objects just like the tongue of a chameleon.

Digitised pneumatics

The Festo Motion Terminal VTEM is opening radical new dimensions in the world of automation, as it is the world's first valve to be controlled by applications. As the first product to truly earn the label 'digitised pneumatics', the VTEM offers a multitude of functions that currently require more than 50 different components to realise. The Festo Motion Terminal uses an integrated concept to ensure energy-efficient operation.

In addition to apps for saving energy, low-energy piezo valves have been developed for controlling the main valve stages. These reduce the power consumption for the pilot control by up to 90% while using just a single valve variant to reduce process costs from the design to the modernisation stage. This is where the Festo Motion Terminal VTEM comes in: it digitises pneumatics, thereby speeding up processes and reducing costs.

This process is now simpler and less expensive thanks to the VTEM automation platform because, instead of individual proportional valves, the Festo Motion Terminal requires only half as many valve slices. With the Festo Motion Terminal, 16 independent pressure zones can be set up. The key here is the digitalisation of the pneumatics: the different functions of the Festo Motion Terminal VTEM can be set using software apps

Bionic Learning Network to inspire digitalisation

The nature-inspired and technology savvy Festo Bionic Learning Network products stimulate innovation in digitalisation. A key example of this is the Festo Adaptive Gripper DHEF, which was derived from the FlexShapeGripper. This gripper was inspired by the chameleon's tongue, with its ability to grip different types of insects. Unlike the mechanical grippers currently available on the market that can only grip specific components, the adaptive shape gripper is extremely flexible. It can pick components with freely formed shapes and round geometries. The absence of sharp edges makes it ideal for gripping sensitive objects such as air nozzles or trim strips. In principle, the gripper can pick up several parts in one movement, for example, nuts from a bowl. This means that it can be used to handle small parts in classic machine building, in the electronic or automotive industry and in supply units for packaging installations.

Thanks to simple operability, position monitoring and speech control in combination with machine learning and artificial intelligence, humans and robots can cooperate intuitively and efficiently.

The Festo App world

The Festo App World app intends to drive digitalisation in software and support customers that are transitioning to Industry 4.0. This App will be the central online platform for purchasing and downloading paid apps and digital services. Festo, as an automation expert, will combine its extensive knowledge of industrial applications with the latest developments in information technology to realise online applications for industrial automation practice. Festo will use digital communication to support its customers throughout the digital customer journey. This Festo app will be released in South Africa in the upcoming months.

Modular control systems

The Festo CPX-E is a great Industry 4.0 addition. This powerful system for factory and process automation has been designed as an

Above: The Festo cyper-physical learning and research platform used by businesses, in industry and at educational facilities.

Right: The Festo CPX-E combines servo and stepper motor technology for smooth mixed operation.

EtherCAT master controller and motion controller with protection to IP20. With NE21-specific certifications, the CPX-E is fast becoming the central control system for handling technology. Several bus modules are available for the configuration as a compact and low-cost remote I/O.

In addition to comprehensive PLC functions right up to multiple axis applications with interpolation, the CPX-E can be easily integrated into existing host systems. This is made possible by the EtherCAT master interface, the integrated PROFINET device interface or the EtherNet/IP slave interface. The OPC UA client and server functions ensure easy integration and interoperability in Industry 4.0 host environments with cloud and digitalisation concepts. In addition to this, the Festo CPX-E features specific software functions that are tailored for products and solution packages from Festo such as Handling technology and complete automation.

Cyber-Physical Factory

The Festo CP Factory (Cyber-Physical Factory) reflects this new Industry 4.0 production paradigm by offering a modular Smart Factory system for teaching and research purposes. The CP Factory is part of a holistic learning factory solution – a modular learning environment that can be used to qualify personnel in the operation of a particular production process or in a particular field of work, such as production technology. A variety of qualification modules can be added to the CP Factory: process-oriented training in the fields of mechatronics, logistics and process optimisation as well as organisational and skills training in aspects such as interdisciplinary collaboration, learning capacity and adaptability.

Industry 4.0 courses offered by Festo

While there are speculations that Industry 4.0 machines might take people's jobs in the industry, Festo believes that machines can never entirely replace humans in the industry and that Industry 4.0 is only there to simplify people's lives. This is why Festo offers Industry 4.0 courses to equip its customers with this change towards digitalisation. This year Festo is offering the following Industry 4.0 courses:

- **Introduction to Industry 4.0:** Although Industry 4.0 has become a keyword for industrial production, most shop floor workers have only a vague ideas of what Industry 4.0 means and what impact it will have on their working environments. This training program provides comprehensive information on Industry 4.0 and creates understanding and acceptance for its implementation. As a result, companies will find it easier to introduce Industry 4.0 and to maintain the motivation of the workforce. The target group includes shop floor workers and machine operators. The course duration is one day.
- **Introduction to I4.0 for management:** Industry 4.0 is an increasingly trending topic, and people working in leadership positions encounter Industry 4.0 more often than most; therefore, they must be knowledgeable about its impacts. Managers need to have a basic understanding of the core elements, technologies, and how their interaction leads to Industry 4.0. Subsequently, they can develop new business models and specific strategies to implement Industry 4.0 solutions in their companies. The target group for this one-day course includes upper management, decision-makers and executives.
- **Industry 4.0 - Applications in practice:** Industry 4.0 allows smart-factory workers to use a series of applications that previously could not be implemented or that could only be implemented through tedious manual labour. These applications can be used for plant operation, maintenance, planning and control, as well as for tracking orders and inspecting plant operation. During this training course, the participants will learn about ways to use these kinds of applications within a complete production process, using the Festo Didactic CP Lab or the CP Factory as an example. This is a five day course that targets teachers and trainers who want to work more closely with the technical contents of the CP Lab or CP Factory.

This year Festo is showcasing all the listed solutions that place it at the forefront of Industry 4.0 at the Festo Automation Expo. The first Automation Expo in Johannesburg has been concluded and was a great success. If you missed the Johannesburg expo,there is still an opportunity to attend expos in Port Elizabeth on the 4th July, Cape Town on the 19th July and Durban on the 15th August. Space is limited so RSVP on www.festo.co.za/expo2019.

For more info about the Automation Expo, contact 08600 FESTO (33786) or email the marketing team at events.za@festo.com.