

ROBOT INNOVATIONS FROM THE HANNOVER MESSE



The Robotics Update team were at the Hannover Messe this April, looking at the latest innovations and talking to the various robot suppliers, who were out in force. Here we present the most some of the most interesting and exciting of those innovations, and highlight the latest news from the key players at the show

There were two key themes underlying many of the stands at this year's Hannover Messe when it came to robotics, and they were collaborative robots and Industry 4.0. Beyond that, of course, there were the ongoing themes of increasing productivity while reducing costs.

If you're looking for collaborative robots at a price that's affordable, Igus' Robolink D robot comes in at just €1500. Where the first generation relied on wires, the new D generation uses directly driven joints. The new generation Robolink D robots were one of the highlights of the Igus stand at the Hannover Fair. The

robots are built up from Robolink D articulated joints are motor-driven slewing ring bearings (iglidur PRT) in a plastic housing. The drive component is a worm gear. The centre bore remains free for feeding cables through. The articulated joints can be ordered with or without motor.

Another innovation on the Igus stand was an extension to the Triflex Retraction System; Triflex RSE a new linear retraction system offering a lightweight, economic design. It is specifically tailored for use with robots with small to medium load capabilities, and makes it possible to actively prevent loops in the robot's work area, even in highly dynamic applications.

Retraction distances of up to 500mm are possible with Triflex RSE. The retraction system is delivered pre-assembled with fixed end on the left or the right.

HUMAN-ROBOT COOPERATION

Mitsubishi Electric and partners presented hands-on handling and automation solutions, with robotic highlights from quality control through to pick and place applications and systems for handling delicate goods.

One particular high speed application was based on the new RH-1FHR MELFA robot which is used by





Bahr Modultechnik in a camera-supported system for sorting pharmaceutical packaging between a conveyor belt and a linear axis. In another demo, Datalogic from the e-F@ctory partner network presented a robot solution with various vision systems, a laser marking system and its own safety technology. The partner applications also included a complete solution from Robotronic AG specially designed for handling in the pharmaceutical and life science sector. In the compact, modular MRT cell, two six-axis robots are both responsible for handling the syringes and are capable of operating at a processing rate of up to 600 syringes per minute.

Mitsubishi Electric has made many developments in order to promote Human-Robot Cooperation (HRC), especially in connection with safety and control technology as well as intelligent robot technology. "Mitsubishi Electric robots continue to make their mark with maximum speed and precision," says Oliver Giertz, European product manager for servo/motion systems and robots at Mitsubishi Electric Europe. "However, the full performance capability has not been achieved yet within HRC. There is a high potential for innovation within the field of assistance in production in particular."

Of the innovative developments presented by the MELFA robots within this area, Giertz says: "Above all, the ability to detect people prior to contact will increase the efficiency of such systems. Our robots are also easy to program and commission. However it is also clear that no matter how much a robot may resemble a human in the way it looks and acts, operating personnel will always be required in order to allocate tasks. Only then can a robot with all its technical benefits assist with production.

"Another challenge facing HRC technology is the need to tap into new professional fields and industries," he continues. "In the medical sector, it

could be used to provide assistance during operations or in laboratory automation or the production of individual components, for example.

Thomas Lantermann, senior business development manager at Mitsubishi Electric Europe, adds: "HRC will also continue to be developed in connection with Industry 4.0 as it can be used to increase flexibility within the production process. The aim is for robots to be used specifically, regardless of the environment or task. In the production process, Industry 4.0 can help to make

comprehensive systems controllable through the application of assistance systems.

"A robot will be able to support or even carry out complex, high-precision fitting or assembly processes. It can collect the information required for traceability, preventive maintenance, quality assurance and energy management and forward it to the MES/ERP system from where it can be made available to the whole value chain. Robots are predestined to be used in the manufacture of personalised products and also to work effectively and efficiently, even with the smallest of quantities."

ABB CONFIRMS YUMI PRICING

There was a massive buzz around the ABB Robotics stand at the Hannover Fair, where the company was highlighting its YuMi collaborative robot. The company also confirmed pricing for YuMi and announced its first orders for this fully collaborative, dual-arm robot.

ABB chief executive officer Ulrich Spiesshofer said customers were energised by the possibilities offered by a robot engineered to work safely side-by-side with people without protective cages.

Spiesshofer said YuMi - costing around \$40,000 per robot - offers not just safety but ease of use as well, thanks to lead-through programming that allows the robot to be taught to complete tasks by operators by simply moving its arms. "It's also so precise, he said, that it can manoeuvre a thread through the eye of a needle, an attribute particularly prized in small assembly including the electronics industry where accuracy and flexibility are in demand.

"I'm incredibly pleased that we booked the first orders for YuMi yesterday," Spiesshofer said. "YuMi is not just a true revolution in robotics technology - it has also garnered an enthusiastic reception from customers." Purpose built for the small parts space, YuMi features two magnesium arms that flex on seven

axes to mimic human-link movements with spatial efficiency. With its dual-arms, flexible hands, universal parts feeding system, camera-based location and state-of-the-art motion control, YuMi has equal application in any small parts assembly environment.

YuMi's introduction is another step in ABB's Next Level strategy aimed at accelerating sustainable value creation. The strategy is building on ABB's three focus areas of profitable growth, relentless execution and business-led collaboration. The company is driving profitable growth by shifting its center of gravity toward high-growth end markets, enhancing competitiveness and lowering risk in business models.

"The new era of robotic coworkers is here and an integral part of our Next Level strategy," said Spiesshofer. "YuMi makes collaboration between humans and robots a reality. It is the result of years of research and development, and will change the way humans and robots interact. YuMi is an element of our Internet of Things, Services and People strategy creating an automated future together."

DELTA LAUNCHES SCARA ROBOT

There was a new name in robotics at the Hannover Fair, with automation giant Delta launching a new SCARA robot and a robot controller with integrated servo drive. Visitors to the Delta stand were able to



witness live demos of the company's SCARA robot arm solution which it says is capable of improving daily productivity by up to three times through high-speed and high-precision compliance control for production lines in the electronics, packaging, materials industries and more.

Features of the DRS40L SCARA robot include an arm length of 400mm and a load capability of 3kg.

Delta says the DRS40L Series SCARA robot features compliance control functions without sensors, and



offers excellent speed, linearity, verticality and repeatability to rapidly and precisely perform operations such as insertion, screw locking, assembly, load and unload, pick and place, stacking and packaging. The automatic process path planning function fulfills industry needs for conveyor tracking processes such as gluing, deburring, coating and soldering.

Further, with the aid of Delta's machine vision systems, it can perform smart identification, inspection and sorting to effectively reduce defect rate for consistent quality delivery. When matched with control units and other peripheral devices such as servo systems, machine vision and linear modular, the SCARA becomes a highly integrated workstation.

Alongside the SCARA robot, Delta also showed its ADSA-MS series robot controller with built-in servo drive. Delta says this unique simplified architecture enables motion control of up to 10 axes (4-axis robot + 6 external axes).

Delta's president and general manager for the EMEA region, Jackie Chang, commented: "Our exhibition portfolio in Hannover Messe 2015 is a living proof of Delta's expertise in integrating a broad spectrum of solutions that truly enhance the competitiveness of our customers."

To date Delta has only announced availability of the SCARA robot in China and Taiwan, but you have to assume, given that it was being displayed at Hannover, that it will be coming to Europe in the near future.

ROBOT ARM AVAILABLE ON A MOBILE BASE

Metralabs is best known for its consumer oriented service robots, but an interesting product on show at Hannover was the Scitos G5 Manipulator, comprising a Scitos G5 mobile base unit with a robotic arm,



delivering a mobile robot capable of precise and delicate transportation tasks.

The company says the Scitos G5 Manipulator offers an accuracy of 2-3 cm. It is not a purely A to B type of robot but has the ability to transport objects from anywhere to anywhere. Implemented with the CogniDrive software there are no environmental changes as well as external sensors or markers necessary.

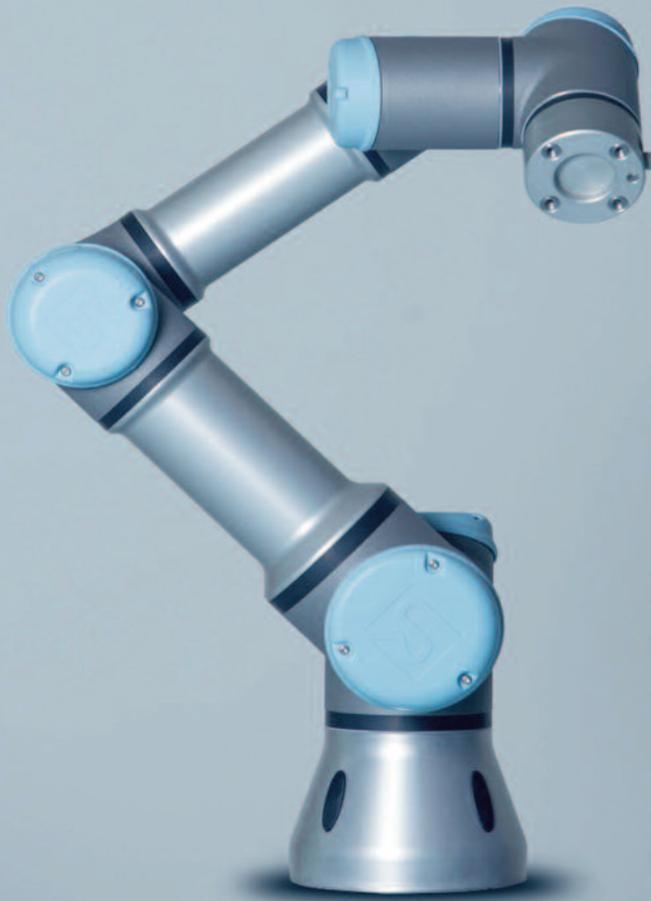
The manipulator side of the robot comes courtesy of a Schunk modular robotic arm, which is completely customisable with any number of joints making the degrees of freedom completely depended on customers wishes and specifications.

TABLE-TOP ROBOT OPTIONS

Along with the key product highlights from Icus, Mitsubishi, ABB, Delta and Metralabs, there were numerous innovative robot products on display at the Hannover Messe 2015, from the likes of Universal Robots, Kuka, Epson and Kawasaki.

Danish manufacturer of light industrial robots, Universal Robots, was exhibiting for the first time at the Hannover Industrial Fair. The company presented its whole family of its lightweight robots, including the new UR3 model. Universal Robots asserts that the UR3 is the most flexible lightweight robot in the world, which can be easily placed on a work desk.

Another company focusing on collaborative robots was Kuka, with the company saying that its LBR iiwa represents the fulfilment of a promise to the market to present a lightweight industrial duty robot. Kuka engineers have developed a machine that opens the door to completely new automation possibilities. With mechanical and drive systems designed for industrial use, Kuka says the sensitive and yielding LBR iiwa heralds an entirely new era in



robotics. These capabilities are reflected in the new lightweight robot's name: LBR iiwa – intelligent industrial work assistant.

For its part, Epson was focusing on robots that add value deliver greater efficiency. Two new 6-axis

robots on display were the ProSix C4 and its big brother the ProSix C4L.

The Epson ProSix C4L has a reach of 900mm, but thanks to the particularly slim arm design, it doesn't take up much space. Epson says this makes the robot unbeatable in its class in terms of space optimisation. The ProSix C4 offers better performance, with a lifting capacity of 4 kg, but with the same light weight and compact dimensions as its predecessor.

Epson was also claiming a first with its vibration control on the new robots through its QMEMS sensor technology. This makes it possible to improve production speeds while keeping a consistently stable level of quality during assembly tasks.

KAWASAKI DELTA PICKER ROBOT

Kawasaki, meanwhile, was showing its new solution for fast pick and place operations where low product weights are required, such as in packaging or sorting processes. The new YF003N Delta Picker provides short cycle times of 0.27 sec for 1kg and 0.45 sec for 3kg payload. With a a maximum work envelope of 1,300mm diameter, the Delta Picker can achieve a maximum of 175 picks per minute.

Kawasaki says the 4-axis robot with an optional fifth axis for picking up two parts in one cycle will be welcomed in areas such as the food, electronics and solar industries.

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