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# Sustainable system solutions and connectable software

Manuela Kessler | 30.05.2022 | Lohr am Main | PI 012/22

At the Hannover Messe trade fair, Bosch Rexroth will present numerous new products for factory automation, connected hydraulics and the electrification of mobile machines

- Industrial ecosystem for the ctrIX AUTOMATION toolkit growing all the time
- Smart Flex Effector - sensor-assisted compensation module for robots increases the degree of automation
- Ready-to-install CytroMotion self-contained actuator reduces energy consumption by up to 80%
- eLION portfolio electrifying mobile machines for locally emission-free operation

**At Hannover Messe 2022, Bosch Rexroth will present innovations for greater sustainability in factory automation and mobile machines as well as connectable software solutions and services for higher productivity. The drive and control system specialist will present solutions covering the entire product life cycle – from engineering and resource-saving operation to predictive maintenance. The software solutions fit into higher-level IT systems and cloud applications thanks to open interfaces and help to drive the vision of the Factory of the Future.**

Bosch Rexroth will be presenting numerous innovations for the highly flexible and connected Factory of the Future at HANNOVER MESSE 2022. Open platforms and industrial ecosystems play an increasingly important role here. Bosch Rexroth shows this with ctrIX AUTOMATION. The ctrIX World partner network is growing all the time, adding hardware to the open automation system and an increasing number of apps which are available for downloading from the ctrIX Store. Users can thus easily select the functions they need and operate them on the ctrIX CORE control system. The new ctrIX COREplus control hardware offers not only additional fieldbus interfaces but also the option of arranging I/O modules in rows. At the same time, a new version of ctrIX CORE offering around seven times more performance will make it possible to carry out automation tasks economically and with great precision however complex they may be.

### Digitalization of the value stream

With its NEXEED Portfolio, Bosch Connected Industry offers software solutions for optimizing industrial manufacturing. NEXEED ensures greater transparency of production processes and identifies deviations, which makes production more cost-effective and improves product quality. NEXEED digitalizes production and ensures an end-to-end flow of data from the machine to the Intralogistics and production control, and then on to the cloud. The NEXEED solutions encourage efficient use of raw and other materials as well as general resources, for example, by reducing reworking and wastage, by more intelligent flows of goods, or by permanently monitoring the status of machines. Remote support solutions, virtual commissioning and online training also help to reduce CO<sub>2</sub>-intensive travel. From the shop floor to the plant and company management, the particular user group is given exactly the information they need for their day-to-day work with the Nexeed Industrial Application System.

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A ctrlX World Partner, Bosch Connected Industry offers additional assistant systems for cycle time monitoring and 3D localization of error sources on the machine via the ctrlX Store.

### **Highly dynamic and autonomous material flow**

The linear motor-driven TS 2 Booster transfer system expands the TS 2 plus transfer system in the 0 to 240 kg weight class. Depending on the application, it is up to ten times quicker than standard transfers and reduces cycle times to a minimum. Bosch Rexroth offers automation solutions not only for the material flow within systems but also for intralogistics. Bosch Rexroth has further developed ROKIT, its modular robotics kit comprising individual software and hardware components, which allows driverless transport systems, fork lift trucks or mobile robots to be put in place quickly. As an open system solution, the modules fit seamlessly into higher-level control systems and support popular laser scanners. The ROKIT Locator determines the vehicle position in real time and produces its own maps of the surroundings with no need for construction aids. The ROKIT Navigator dynamically plans routes and allows the entire fleet to react to obstacles. The ROKIT Motor expands the toolkit with a ready-to-install drive module for payloads of up to a ton. As the central interface providing access to all ROKIT components, Bosch Rexroth has further developed the user guidance for the ROKIT aXessor.

### **Kassow Robots expands product portfolio for factory automation**

For the first time ever, Kassow Robots will present its cobots at the Bosch Rexroth stand. The lightweight robots produced by the Danish manufacturer expand the factory automation portfolio. Bosch Rexroth acquired a majority stake in the company at the end of April. With their seven axes, cobots can work in very tight spaces. They can be used in a variety of industrial production settings thanks to their load-bearing capacity, range and speed. The cobots offer ranges from 850 to 1800 mm, load capacities from 5 to 18 kg and can reach speeds of up to 225 millimeters per second.

### **Smart Flex Effector: Automation with fingertip sensitivity**

The Smart Flex Effector, a new, sensor-assisted compensation module from Bosch Rexroth, makes linear and articulated robots as sensitive as a human hand. As a result, processes which were always difficult to automate – for example joining processes with minimal tolerances, complex assembly work or difficult handling tasks – can now be carried out, optimized and monitored, even with installed systems. With kinematics in six degrees of freedom, the compensation unit measures position deviations with respect to the workpiece precisely. The robot control system then compensates for the deviations immediately. The Smart Flex Effector also reduces the time previously needed to teach robots.

The Smart Flex Effector is part of the Smart MechatroniX solution platform. Its linear motion technology, electronics and software subsystems can be commissioned quickly and are highly versatile.

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### **Self-contained actuator reduces CO2 emissions**

Connected hydraulics combines the physical advantages of fluid technology such as high power density, reliability and robustness with the almost infinite possibilities of digitalization and connectivity on the Internet of Things. Using modern connected hydraulic solutions, machine and system concepts can be implemented faster and more individually while reducing costs along the entire process chain. Sustainability is another key point: Efficient production systems increase cost effectiveness and at the same time are key to reducing CO2 emissions.

Self-contained actuators for example can increase energy efficiency by up to 80 percent and thus significantly reduce CO2 emissions compared to conventional hydraulic solutions. As a ready-to-connect system solution, CytroMotion from Bosch Rexroth produces linear movements with forces of up to 110 kN and speeds of up to 740 mm/s. The self-contained actuator combines proven components such as an electric motor, a hydraulic pump and a hydraulic cylinder as well as shut-off devices to form a compact, integrated solution with all-electric control. On the customer side, condition monitoring can be added to increase the availability of the system solution. Via open interfaces and pressure sensors, anomalies in potentially critical process parameters can be identified early on and unplanned downtimes can be avoided.

### **Condition monitoring increases availability**

Condition monitoring solutions increase the availability of Hägglunds drive solutions. They can be used to optimize drives and maintenance planning. Data are captured in the drive system via sensors. Users can call up these data remotely via the web-based interface. The drive data visualization is clear and easy to understand. This enables fast detection and execution of necessary maintenance work. If critical threshold values are exceeded, the system generates alarms and warnings and sends them to defined recipients. The company also offers remote troubleshooting, which helps to diagnose errors more quickly and derive recommendations for action. Identifying wear and other fault causes early on allows components to be replaced as planned and significantly increases availability.

### **eLION: Locally emission-free mobile machines**

Bosch Rexroth is encouraging the trend towards electrified, locally emission-free drivetrains in mobile machines with the modular and scalable eLION platform. It includes motor generators, inverters, transmission units, software and accessories as well as tailored solutions for work and travel drive hydraulics for high voltage applications (400 – 700 VDC). The platform was developed specially for the challenging environmental conditions encountered in off-highway applications. The inverter offers safety functions in accordance with ISO 13849 and 25119. The scalable portfolio covers a nominal power range from 8 to 200 kW as well as peak power levels up to 400 kW in various sizes for use in compact and heavy machines. eLION also allows vehicles to be connected to the Internet of Things (IoT) and telematics systems as a prerequisite for driver assistance systems, automated machines and remote maintenance.

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The new ctrlX COREplus control hardware offers not only additional fieldbus interfaces but also the option of arranging I/O modules in rows. (Image source: Bosch Rexroth AG)



Bosch Connected Industry offers software solutions for the optimization of industrial manufacturing with the NEXEED portfolio. (Image source: Bosch Connected Industry)



The modular ROKIT toolkit includes software and hardware components for autonomous driving, irrespective of the vehicle architecture or size. (Image source: Bosch Rexroth AG)

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The lightweight robots produced by the Danish manufacturer Kassow Robots expand the factory automation portfolio. Bosch Rexroth acquired a majority stake in the company at the end of April. (Image source: Bosch Rexroth AG)



Sensor-assisted compensation unit for articulated and linear robots: The Smart Flex Effector increases precision and productivity, avoids errors and allows greater automation. (Image source: Bosch Rexroth AG)



Compact hydraulic power, electrically controlled: With CytoMotion, Bosch Rexroth has expanded its range of self-contained actuators for forces of up to 110 kN. (Image source: Bosch Rexroth AG)

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Condition monitoring solutions increase the availability of Hägglunds drive solutions. (Image source: Bosch Rexroth AG)



Rexroth's modular and scalable eLION platform for the electrification of mobile machines includes motor generators, inverters, transmission units, software and accessories as well as tailored hydraulics. (Image source: Bosch Rexroth AG)

### Basic Information Bosch Rexroth

As one of the world's leading suppliers of drive and control technologies, Bosch Rexroth ensures efficient, powerful and safe movement in machines and systems of any size. The company bundles global application experience in the market segments of Mobile Applications, Machinery Applications and Engineering, and Factory Automation. With its intelligent components, customized system solutions and services, Bosch Rexroth is creating the necessary environment for fully connected applications. Bosch Rexroth offers its customers hydraulics, electric drive and control technology, gear technology and linear motion and assembly technology, including software and interfaces to the Internet of Things. With locations in over 80 countries, more than 31,000 associates generated sales revenue of around 6.2 billion euros in 2021.

### Basic Information Bosch

The Bosch Group is a leading global supplier of technology and services. It employs roughly 402,600 associates worldwide (as of December 31, 2021). The company generated sales of 78.7 billion euros in 2021. Its operations are divided into four business sectors: Mobility Solutions, Industrial Technology, Consumer Goods, and Energy and Building Technology. As a leading IoT provider, Bosch offers innovative solutions for smart homes, Industry 4.0, and connected mobility. Bosch is pursuing a vision of mobility that is sustainable, safe, and exciting. It uses its expertise in sensor technology, software, and services, as well as its own IoT cloud, to offer its customers connected, cross-domain solutions from a single source. The Bosch Group's strategic objective is to facilitate connected living with products and solutions that either contain artificial

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intelligence (AI) or have been developed or manufactured with its help. Bosch improves quality of life worldwide with products and services that are innovative and spark enthusiasm. In short, Bosch creates technology that is “Invented for life.” The Bosch Group comprises Robert Bosch GmbH and its roughly 440 subsidiary and regional companies in some 60 countries. Including sales and service partners, Bosch’s global manufacturing, engineering, and sales network covers nearly every country in the world. With its more than 400 locations worldwide, the Bosch Group has been carbon neutral since the first quarter of 2020. The basis for the company’s future growth is its innovative strength. At 128 locations across the globe, Bosch employs some 76,100 associates in research and development, of which more than 38,000 are software engineers.

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