

# Hannover Messe USA Goes Digital

Matthew Jaster, Senior Editor

There would have been an incredible lineup of products and technologies in Chicago in the Hannover Messe USA pavilion at IMTS 2020 – everything from cobots and smart factory automation solutions to digital twins and mechanical power transmission components.

Unfortunately, the planet had other ideas this year and we continue to conduct business on laptops, smartphones and Zoom meetings for the foreseeable future. This doesn't mean we can't imagine perusing McCormick Place in search of intelligent bearings, new control systems, IIoT solutions, and gearbox software.

## Beckhoff Automation

INTRODUCES CONTROL SYSTEM AND PANEL PC

### CX8191 Control System

The CX8191 is a control system with a switched Ethernet port. It supports the BACnet protocol. E-bus or K-bus terminals can be attached as required; the CX8191 automatically recognizes the type of I/O system connected during the start-up phase.

The control system is programmed with TwinCAT 3 via the fieldbus interface or the additional Ethernet interface. TwinCAT 3 licenses must be ordered via the TwinCAT 3 price list. The BACnet license is already installed on the device and does not need to be ordered separately.

BACnet (Building Automation Control Network) is a standardized, manufacturer-independent communication protocol for building automation. Areas of application include HVAC, lighting control, safety, and fire alarm technology.

In conjunction with the EL6861 BACnet-MS/TP terminals, the CX8191 can act as a router to MS/TP networks including support for several MS/TP networks. In addition, further protocols and services can be supported, such as OPC UA, MQTT or Modbus TCP/RTU. Therefore, the CX8191 is a virtually universal device that can be used very flexibly, from control tasks through to gateway functions.

### CP32xx Panel PC

With the CP32xx series, a high-end Panel PC with multi-touch can be used directly in the field. The devices in a slender aluminum housing feature complete IP 65 protection and are designed for mounting arm installation. The Panel PCs offer maximum computing power with processors of the latest generation, such as Intel® Celeron® or Core™ i3/i5/i7.

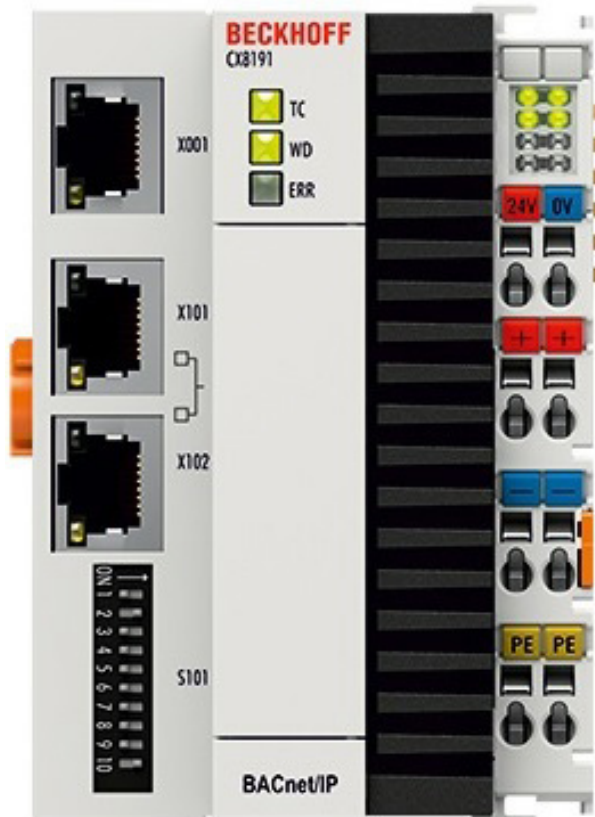
A choice of seven different multi-touch TFT displays, in sizes between 12-inch and 24-inch and 4:3, 5:4 or widescreen 16:9 formats, are available. Cooling is achieved by means of cooling fins on the outer wall as well as fans inside the closed housing. The operating temperature range is 0 to 45 °C.

The Panel PC features an integrated rotatable and tiltable mounting arm adapter for a 48 mm diameter mounting arm tube. There is a choice of attaching the mounting arm from above or below. The connecting cables are laid through the mounting arm. The Industrial PC connections (up to six) with IP 65 connectors are positioned in the large wiring space and are easily accessible. The wiring area can be opened easily without dismounting the device from the mounting arm, offering fast access to the IP 65 connectors for power supply, Ethernet and optional fieldbus or USB. Prefabricated cables in various lengths are available for all connections. The C32xx series Panel PCs are supplied with a 24 V power supply unit, optionally with integrated uninterruptible power supply (UPS). A battery pack can be connected externally and installed on a DIN rail in the control cabinet.

The CP32xx Panel PCs are equipped with one or two hard disks, SSDs or CFast cards or combinations thereof. With the on-board RAID controller, two same hard disks, SSDs or CFast cards can be mirrored. The data media and the lithium battery of the system clock are accessible from the rear under the cover. There is a PCI slot in the CP32xx. A factory-fitted FC9062 PCIe module with two additional Ethernet ports can be added. NOVRAM is also available as PCIe module for fail-safe data storage.

### For more information:

Beckhoff Automation  
Phone: (952) 890-0000  
[www.beckhoff.com](http://www.beckhoff.com)



# Igus

## LAUNCHES PLAIN INTELLIGENT BEARINGS

Presented last year as a prototype, igus has now developed its first isense plain bearing series with five iglidur materials for predictive maintenance. Whether in the food industry, textile machines, forklifts, or construction machines, with the intelligent isense plain bearings, users receive a durable and lubrication-free solution that provides information about their wear. Maintenance can be planned in good time and machine and system failures are prevented.

Wear-resistant parts such as plain bearings must withstand extreme loads in machines and plant. If one of these bearings fails, there will be big trouble. For this reason, igus presented the first study of an intelligent plain bearing at the Hannover Messe 2019. The principle: technology integrated in the bearing detects wear in advance and gives the user a signal in good time when the wear limit is reached. Maintenance can be planned in advance, and unnecessary



replacement and unplanned machine and system failures are avoided. After many series of tests in the 3,800 square metre in-house test laboratory, igus has now developed the first isense standard range for its lubrication-free iglidur plain bearings.

“The catalog range includes five materials with which we can cover a large part of highly stressed applications,” said Stefan Loockmann-Rittich, division manager iglidur plain bearing technology at igus GmbH. The FDA-compliant material iglidur A180, which is specifically designed for use in the food industry, the heavy-duty bearing iglidur Q2E for use in construction machinery and agricultural engineering, the all-rounder material iglidur G, the endurance runner iglidur J as well as iglidur P210 as a specialist for pivoting and rolling applications are also included. igus offers all intelligent plain bearings in three dimensions each with an inner diameter of 20, 30 and 40 millimetres. Further sizes and materials will follow.

To connect the isense plain bearings, igus has four suitable cables with an oil-resistant and media-resistant PUR outer jacket, in four standard lengths of one to ten metres, in its portfolio. In addition, the user has the choice between two connector types. The sensors measured data can be integrated by the machine and equipment operators into their

systems in different ways. igus offers three readout units for this purpose: either the user can manually read out all plug-in points or install a control unit with a red/green display on the machine which provides information about the condition of the plain bearings. Another possibility is the connection to *icom.plus*. For this purpose, a radio module sends the sensor data by wireless transmission to the communication module. From here, the integration of data to the IoT, cloud system or to the customer network is possible on a wire-bound basis. “The customer has the freedom to read the data in the way that suits him best,” said Loockmann-Rittich.

### For more information:

Igus  
Phone: (800) 521-2747  
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## Emerson's

### ALUMINUM CYLINDER BOOSTS MACHINE SPEEDS AND CUTS DOWNTIME

Machine builders and their end-user manufacturers can increase machine speeds and reliability with the new Aventics TM5 TaskMaster aluminum cylinder from Emerson. The National Fluid Power Association (NFPA)-compatible pneumatic cylinder reduces cost, energy consumption, equipment wear and downtime.

With its rugged aluminum body construction and a steel piston rod, the TM5 TaskMaster features Emerson's state-of-the-art pneumatic cushioning technology that allows an ideal cushion adjustment to slow down the piston to a stop by the time it reaches the endcap. Ideal cushioning reduces the time it takes the cylinder to complete a stroke, allowing an improvement in efficiency that significantly boosts machine speed and lowers endcap hammer. Ideal cushioning also reduces cycle time and enables the TM5 cylinders to carry higher loads without sacrificing cylinder performance.

The cylinder incurs less stress and there is no end-of-stroke bounce or end-cap slamming, which is a main source of cylinder wear, slowness and noise. Ideal cushioning thus lengthens cylinder operating life and reduces downtime related to cylinder failure. Additionally, it reduces machine noise and vibration while reducing energy consumption.

“The all-new TM5 TaskMaster gives machine builders and end-user manufacturers the tools to make their machines faster and more reliable,” said James Ward, vice president engineering, machine automation, Americas, at Emerson.



“It’s the highest performing and most reliable TaskMaster cylinder ever produced, so it gives them an opportunity to build a competitive advantage.”

The NPFA-compliant TM5 is the latest addition to the TaskMaster line of aluminum cylinders, an industry standard for 50 years. The TM5 TaskMaster is supported by a full suite of web-based design and integration tools, with many products preconfigured and ready to order. With no additional engineering time for setup, Emerson’s online configurator provides a product part number, pricing and 2D and 3D CAD drawings in one convenient place. In addition, all product information and spare parts can be found in the Aventics Pneumatics Shop.

TaskMaster TM5 provides a high-quality and readily available interchange cylinder to meet OEM and machine requirements. In combination with the online tools, a fast-delivery program allows for quick turnaround of orders, reducing lead times for customers. From configuration to production, Emerson’s process is completely automated.

#### For more information:

Emerson Automation Solutions  
Phone: (888) 889-9170  
[www.emerson.com](http://www.emerson.com)

## Festo

### CONTINUES TO ADVANCE DIGITAL SOLUTIONS

Festo is advancing digitalization in all its corporate divisions. Many aspects of Industry 4.0 are already reality today in the Festo Group. Festo is leading its customers and employees into the digital future. To this end, the company is developing new future-oriented concepts founded on the triad of innovative and energy-efficient technologies, intuitive human-machine collaboration, and education and further training.

In the 1950s, Festo became the first company in Europe to use compressed air as a drive medium in automation. The



company now offers over 30,000 products and system solutions for pneumatic and electrical automation technology which, thanks to a large variety of modular systems, can be tailored to specific customer applications in many different factory and process automation industry segments. These

include pneumatic and electric drives, valves, servo controllers, motion control, valve terminals, installation-saving connection technology, handling and assembly technology, air preparation equipment, fittings, vacuum technology, position and quality inspection, sensors and control technology.

The core product range comprises components from every phase of the pneumatic and electrical control chain, with which around 80% of all applications can be accomplished effortlessly and quickly. Festo also offers a wide range of modular systems solutions and standard handling systems.

Important industry segments are the automotive sector, the food and packing industries, electronics and assembly, biotech, pharmaceuticals and cosmetics, medical engineering and laboratory automation, the chemical industry and water treatment.

Smart products, connectivity, the mining and interpretation of data, including via the cloud, and dashboards for visualization, already offer added value for customers. Products like the energy efficiency module E2M, IO-Link-capable components, the CPX-IOT gateway or interfaces like OPC-UA contribute to this process. Another basic requirement for successful and consistent digitalization is mechanical, electrical, and intelligent connectivity through software solutions, enabling all customers to find their bearings quickly and intuitively.

Festo is promoting this with an open automation architecture and a large product portfolio made up of axes, motors, and controllers. Standardized software tools are also being developed: configurators for smart engineering, the Festo Automation Suite for easy commissioning and the digital maintenance manager Smartenance for reliable operation. Digitalized pneumatics such as the Festo Motion Terminal VTEM (see photo) makes pneumatics more flexible than ever before. The reason: apps define the function, but the hardware remains the same.

In addition, data analytics, machine learning and artificial intelligence are shaping the agile product development of the future. With the takeover of Resolto Informatik GmbH in 2018, the competence in the field of AI has been further expanded.

Festo Didactic offers a comprehensive range of learning solutions for the trend topics of digitalization and energy turnaround. The learning content is specifically tailored to these topics in learning paths and conveys the skills that will be in demand among the specialists of tomorrow. Technological knowledge is imparted both in team-oriented training sessions on physical learning systems and, increasingly, independently of time and place through digital online learning options. Festo LX (Festo Learning Experience) is the new online portal for learners and trainers, which stands for customized, motivating learning in vocational training.

#### For more information:

Festo Corporation  
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## NUMgear

OFFERS PROFILE GRINDING CYCLOID TECHNOLOGY MODULE

The NUMgear Profile Grinding Technology Module for Involute and Technology Module for Cycloids are set between user input from an HMI and the CNC. It takes the gear and tool data as input and calculates the shape of the gear tooth as well as the path of the dresser to create the corresponding grinding wheel.



Most robotic systems demand smooth, precise, and reliable low speed movement. Deriving that movement from a motor that runs optimally at, say, 1,000 rpm necessarily involves some form of speed reduction gearbox. Designers typically have a choice of two types of reduction gear box — planetary drives and cycloid drives.

Planetary drives (or gearboxes) use one sun gear in the middle and planet gears around it, all imbedded into a ring. All of the gears, including the ring, have involute profiles. These types of drives are ubiquitous — they are used in a broad diversity of applications, including cars and other road vehicles, and are produced by virtually every gear manufacturer in the world.

The other type of speed reduction gear drive is the cycloid gearbox. The input shaft drives an eccentric bearing that in turn drives the cycloidal disc in an eccentric, cycloidal motion. These gears do not require real gear wheels.

Gearboxes that use cycloid gears have very few moving parts and are some of the most efficient and reliable speed reducers available today. Single stator/rotor combinations can accommodate ratios as high as 300:1 and can provide efficiencies in excess of 93 percent.

The market for gears and gearboxes will still increase in years to come. With the rise of electric car drives, the demand might not be in the numbers, but in the quality of gears. Less noise, more compact, and better performance

are the requests of the gear industry.

For mass production of involute gears Threaded Wheel Grinding is the obvious choice for external gears when it is all about speed.

### For more information:

NUM Corporation  
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Num.com

## Mitsubishi Electric

OFFERS NEW MODULES FOR SAFETY SYSTEM

Mitsubishi Electric has enhanced the capability of its MELSEC iQ-F series PLCs with two new modules forming the basis of a compact, integrated safety system. The modules simply connect to an FX5U or FX5UC PLC CPU and reduce wiring requirements. Machine builders and systems integrators can easily and quickly implement a safety control system as no programming is necessary.

A key focus in the development of the new modules was to provide simplicity of set-up for the safety application. A rotary switch on the front of the module enables the user to select from nine types of built-in programs, eliminating the need to load or develop the required sequence programs for safety control. This significantly reduces set-up time compared with a conventional architecture. The principle of simplicity also extends to visualization. The PLC's built-in web server make it easy to monitor the status of both the standard control and safety control system.



As well as simplifying the set-up of the safety application, the new modules also reduce the man-hours required during the engineering phase of a project. The FS5-SF-MU4T5 safety module and FX5-SF-8D14 safety input expansion module connect directly to the PLC. This eliminates the additional wiring that would be required for a traditional safety controller or when constructing a system with safety relays. Connection of the safety I/O has been simplified through the use of spring clamp terminals on the new modules.

The addition of the new safety modules to an FX5 PLC enables users to build a compact safety system that is certified to Category 4, PLe and SIL3 international safety standards.

### For more information:

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