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# DPN DESIGN PRODUCT NEWS



[www.dpncanada.com](http://www.dpncanada.com) • June 2012 • Volume 40, Number 4

**INSIDE:** Hannover Messe | Switches | Adhesives & Fasteners | Motion Control



### Assembly line design

Tecnomatix 10.1 release software from Siemens PLM Software is said to improve the ability to assure worker productivity and safety, and optimize production while improving quality.

[www.siemens.com/tecnomatix](http://www.siemens.com/tecnomatix)



### Flange-mount connector

CONEC has advanced its water-resistant RJ45 series of connectors to include Ethernet I/O ports with a special flange-mount. The units are die-cast, nickel-plated and IP67-rated.

[www.conec.com](http://www.conec.com)



### Temperature transmitters

The TX-M12 series of temperature transmitters from Omega cover from -200° to 850°C and are housed in a stainless steel enclosure. Units measure 38 mm diameter with a height of 20 mm.

[www.omega.ca](http://www.omega.ca)

## Design services company shines in the medical market

Petko Design's new advanced FDM 3D printer sets it apart

By Peter Caulfield

**P**etko Design Inc. of Richmond, BC, has just acquired an industrial-version fused deposition modeling (FDM) three-dimensional printer. Petko operations manager Shaun Granleese says the Fortus 400mc printer ([www.fortus.com](http://www.fortus.com)), which is made by Stratasys Inc. of Minneapolis, is one of the first industrial versions of an FDM printer in BC's Lower Mainland.

Its \$100,000-plus price and 600 kg size notwithstanding, Granleese says the printer is more cost-effective and enables quicker turnaround than outsourcing prototype manufacturing to contractors.

"Now we can make prototypes and small production run parts in-house and have them ready by the end of the day," Granleese said.

*Continued on page 7*

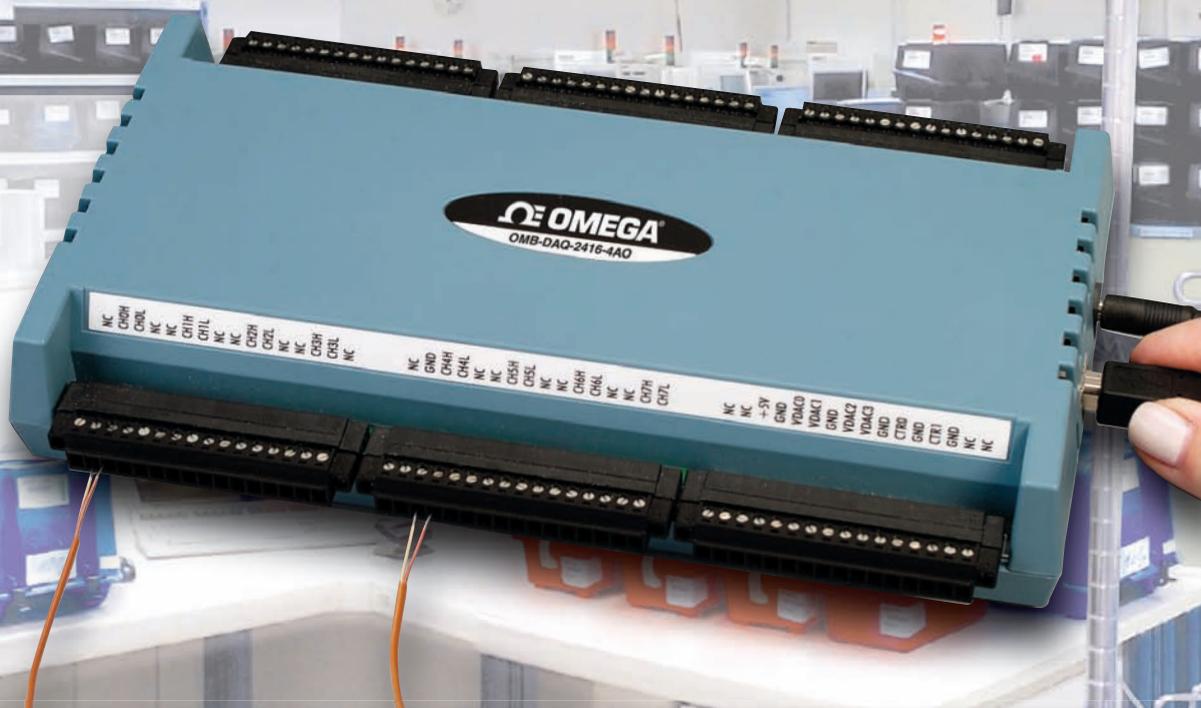
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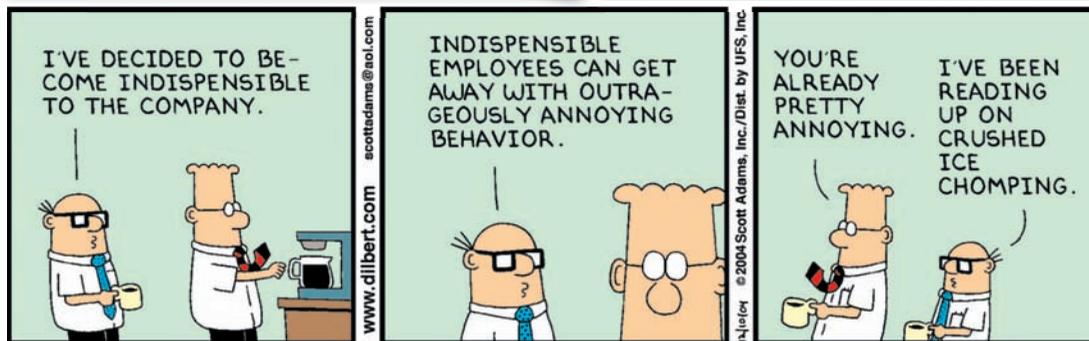
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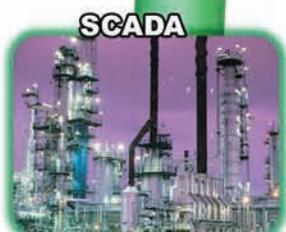
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**Irwin Industrial offers more from new headquarters**



**8**

Glenn Irwin (above), president of Irwin Industrial Electronic Components & Hardware, played host at the distributor's open house.

**Siemens PLM Connection conference in Las Vegas**



**12**

CAD Industry Watch columnist Bill Fane heard how the Boeings of the world have embraced product lifecycle management (PLM).

**U.S. party convention gets hydraulic jack boost**



**15**

Nook Industries describes how two-ton ActionJac ball screw jacks efficiently lifted 300-pound walls of a national party convention stage.

**Hannover Messe 2012 trumpets green tech message**



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Energy conservation was top of mind at Hannover Messe. Above: Festo chairman Dr. Eberhard Veit conducts booth tour for a Chinese delegation.

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**EXCLUSIVE ONLINE BLOGS**

**CAD Software Blog**  
Bill Fane exclaims: It's A Bird! It's A Plane! No, It's A 3D SpaceMouse!

**Renderings Blog**  
Associate Editor Rob Colman reports on Italy's diverse innovation streams

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## Innovation makes the world go around

From wind turbines to microbatteries, from Hannover to Las Vegas, technology advances with creative minds and businesses

The world of innovation is in good hands. That's what my travels taught me over the past couple of months from events from as far apart as Hannover, Germany and Las Vegas, Nevada.

As an electronic engineering technologist, it thrilled me to see the latest developments in automation and technology at Hannover Messe 2012 and the Electronics Distribution Show (EDS 2012) in Vegas.

Germany has been a green tech leader for some time now, evidenced in part from observing massive solar and wind farms off the autobahn between Leipzig and Cologne. Wait, there's an electric vehicle recharging station at a McDonald's restaurant, not just at a demonstration booth in a trade show!

At Hannover Messe (see pages 21 and 22), everyone from Volkswagen to Phoenix Contact were demonstrating some kind of e-car technology. On a tour of Harting Inc. in Espelkamp, a small town in northwestern Germany, I noticed the company uses e-cars to get between its manufacturing sites. Philip Harting, a third-generation executive of the family-run automation component business, told me that he believes his next personal vehicle will be an e-car.

Renewable energy also played a part in the Hermes Award at this year's Hannover Messe. Phoenix Contact

Yes, you can recharge your electric vehicle at a McDonald's restaurant in Europe

won this technology "Oscar" for 2012 with its wind turbine lightning monitoring system.

At EDS, companies such as Varta Microbattery, with its unique battery chemistries making waves in the medical market, and Orion Fans, with its "smart" ac fans providing quiet cool-

ing in enclosures with energy saving side-benefits, demonstrated their innovations.

Every year at this event, passive electronics components distributor TTI hosts a strategic outlook breakfast. The company is modestly bullish on the recovery in the electronics industry, meaning that designers continue to bring new products to market that soak up component production from around the world.

In addition, EDS provided the platform that brought my travels full circle. Harting hosted a press conference to announce its global distribution agreement with online electronics components distributor Digi-Key (see page 8).



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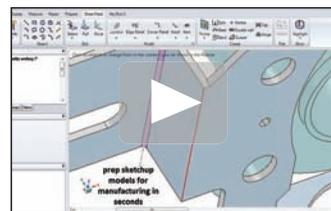
Video highlights at [dpncanada.com](http://dpncanada.com) reveal experts demonstrating methods that address design engineering, manufacturing automation and mechatronics.

**Feature level collaboration with CATIA V5 and Version 6 from Dassault Systèmes**



A new compatibility from Dassault Systèmes enables seamless Live Collaboration between CATIA Version 6 and V5. 3D Models created in CATIA Version 6 can be sent to V5, retaining their core features.  
<http://ow.ly/aXzgn>

**SpaceClaim Engineer 2012 multi-purpose 3D CAD software**



Demonstration of SpaceClaim Engineer 2012, a multi-purpose 3D CAD tool that performs direct modeling operations on parts and assemblies. The design application also accepts major third-party file formats for import.  
<http://ow.ly/b0aH5>

**Beckhoff Automation talks about latest EtherCAT standard at Hannover Messe 2012**



At Hannover Messe 2012 (more video coverage on page 20) Joe Ottenhof, regional manager, Beckhoff Automation Canada Ltd., summarizes EtherCAT, a fieldbus communications standard that offers 12.5 microsecond performance.  
<http://ow.ly/aXwMy>

# Product design house invests in 3D printer

continued from Front Cover

Founded in 2005 by Mirjan Petek, who is the company's president, Petko ([www.petkodesign.com](http://www.petkodesign.com)) is a service company with engineering, design and development capabilities. Granleese says Petko takes the concepts that have been developed by their customers and turns them into commercial products by developing and integrating the electrical, mechanical and optical components.

"We provide services for companies that are looking for an experienced team, but do not want to go the expense of hiring managers and employees and buying a lot of



Petko Design has developed a digital medical camera for a customer that is designed to sit on the top of scientific microscopes.

software and equipment," Granleese said. "We fill in the pieces missing in other companies, by providing them with specialized design skills."

Granleese says Petko offers electrical, mechanical and optics products engineering design and development capabilities. Services include schematics and PCB design; high-speed mixed signal (analog and digital) electronics circuit design; simulation of performance and signal integrity; and fast prototyping of multi-layer circuit boards. Petko can also prepare the documentation that is required for the certification or regulatory approval of a product.

"Our customers' ideas are transformed from a concept to a fully-functional prototype that is ready for manufacturing," he said.

Granleese says Petko has an extensive set of tools for electrical and mechanical design, simulation, and testing, including FPGA (field programmable gate array) design.

The company specializes in medical devices, and understands the many regulations and standards connected with them. Before he started Petko, Petek used to work for PMI Labs (formerly Perceptronix Medical Inc.), where he was involved in the development of products for the

early detection of lung cancer.

Petko has undertaken "dozens" of projects since the company was founded. Most of the company's

customers are located in BC, but it has also done business all over the world, including China. The company has 2000 square feet of labs

and offices, including an optics clean room. It has eight full-time staff, plus a large extended family of contractors and contributors.

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Harmony XB5R transmitter



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### Easier for your customers, too

They will love Harmony XB5R for its robust design and freedom of mounting, making it especially useful on equipment such as conveyors and mobile devices. Customers can add external antennas to extend the coverage range and have more than one unit controlling the same equipment, i.e., many buttons can turn on/off a single receiver and vice versa, which becomes critical for industries where people and equipment constantly move around. And, with the battery-free design, they'll never have to worry about replacing or recycling batteries and can benefit from the uninterrupted availability of their operations.

Build with Harmony XB5R wireless, battery-less push buttons and build your competitive edge.

### Discover the rest of the Harmony family



Harmony XB5 Ø 22 mm plastic push buttons and pilot lights



Harmony XB5 Ø 22 mm plastic push buttons and pilot lights



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## Harting signs agreement with Digi-Key

Harting, Inc., has signed a global distribution agreement with Digi-Key ([www.digikey.ca](http://www.digikey.ca)).

“Our partnership with Digi-Key, one of the fastest growing providers of electronic components in the world, will make it easier and faster for the engineering community to find and specify just the right Harting solution for their application,” explained Rolf Meyer, president and CEO of Harting Inc. of North America ([www.harting.ca](http://www.harting.ca)).

According to Digi-Key president Mark Larson, his company has a “very strong marketing engine” and “we are eager to get started and show (Harting) how we can perform.”

With Harting’s recognized position as a leader in the introduction of new interconnect technol-



Digi-Key president Mark Larson welcomes the partnership at the Harting agreement announcement at EDS 2012 in Las Vegas.

ogy, and Digi-Key’s focus on electronic components, the engineering community and their broad customer base, both companies are excited to bring this opportunity to their customers.

Electronic connectors are being increasingly used in rugged applications, while requirements also demand smaller package sizes and more efficient assembly processes. Digi-Key’s customer service, combined

with its web-based search tools, provides customers and prospects with the opportunity to easily access the breadth of Harting’s product lines.

Harting offerings include electrical and electronic interconnect products, backplane solutions, network components and cable harnesses for various industrial and high reliability markets.



Xtronics president Claude Hajji accepted the top APEM switches sales award for 2011 at EDS in Las Vegas.

## Xtronics earns APEM award

Manufacturers representative Xtronics of Concord, ON, has received the 2011 Sales Representative of the Year award from APEM. The multi-line representative was recognized for outstanding sales growth, strong sales support and a commitment to new APEM opportunities. Claude Hajji, president of Xtronics ([www.xtronics.ca](http://www.xtronics.ca)), accepted the award at EDS 2012 in Las Vegas last month.

APEM ([www.apem.com](http://www.apem.com)) is a maker of electrical and electronic switches for agricultural machinery, refuse equipment and consumer products. Lines include panel switches, PCB switches, joysticks, switch panels and LED indicators.

Specializing in sensing and switching applications, Xtronics also represents Honeywell Aerospace & Defense Electronics, Pepperl+Fuchs, Enersys Reserve Power, Hamlin, MTI Instruments and Honeywell Sensing & Control.

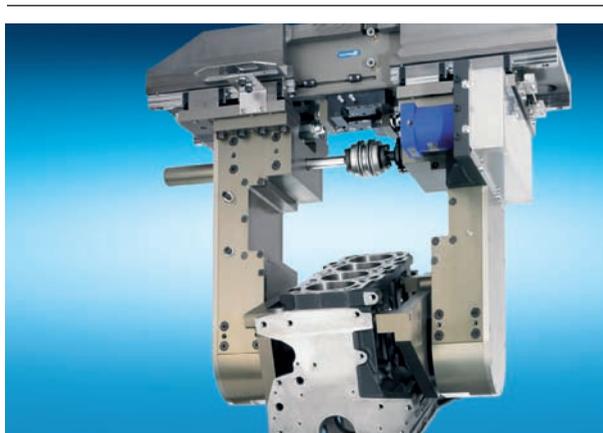
## Rotator Products expands engineered crane solutions

WOODBIDGE, ON – Rotator Products Ltd. ([www.rotatorproducts.com](http://www.rotatorproducts.com)) has announced a national agreement to represent the hoist component manufacturer Gosan of Spain for all of Canada.

According to Rotator Products president Ajay Bajaj, Gosan hook blocks for cranes, sheave blocks and custom barrel couplings are suitable for extremely rugged environments.

“Gosan engineered products target oil and gas, and mining markets where cranes, hoists and winches are used.”

Rotator Products also recently added Incosa Solutions of Belgium to its engineered offerings for cranes. Incosa provides digital load limiters, load cells and wireless GSM communication on its i-c4c intelligent controller platform ([www.loadlimiters.com](http://www.loadlimiters.com)).



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## Irwin Industrial opens new HQ

AURORA, ON – Irwin Industrial has just celebrated the opening of its new headquarters for the distribution of electronic hardware and fasteners.



The new headquarters for Irwin Industrial electronic hardware and fasteners. Inset: Glenn Irwin, president and CEO of Irwin Industrial.

Located on a 2.27-acre property, the warehouse and office facility will accommodate a footprint of up to 40,000 ft<sup>2</sup>. The initial build is 22,697 ft<sup>2</sup> over two floors.

Irwin’s quality department includes three inspectors and a sophisticated and varied

collection of equipment including an X-ray fluorescence spectrometry station to detect restricted substances identified by the RoHS directive. Irwin’s quality system is certified to ISO 9001:2008 by Intertek.

The company ([www.irwin-ind.com](http://www.irwin-ind.com)) counts 40 brands on its line card, including Bivar, CoolTron, E-T-A Circuit Breakers, Heyco, Jergens, Keystone, Kyocera, Richco, Schurter, SunLED and WECO.

Warehouse accommodates 28 foot working height. Irwin has current capacity for approximately double the SKUs it stores by migrating to a high-density racking configuration and appropriate picking equipment.

The company was founded in 1970 and now has a staff of 44 with 34 in the Aurora facility. Offices are also located in Surrey, BC, Calgary, Kirkland, QC and Rochester, NY.



## Students up to the Canadian Fluid Power Challenge

TORONTO – Middle school students building devices at this year's Canadian Fluid Power Challenge held last month needed to pick up a wooden block and deposit it in one of the designated areas along an annulus. The greater the arc covered to the drop-off point, the greater the number of points earned.



The Canadian Fluid Power Challenge winning Hodgson team in action. Andy Wu (left), Keira McMaster, Kayley Jacobs and Matthew Pryor.

"I was amazed at some of the designs that the students conceived for getting the blocks to the high point drop off areas," noted Steve Rogers, facilitator of the Challenge.

"Some of their solutions I had never thought of or seen in previous competitions!"

The team from Hodgson Senior Public School was the overall winner of this year's Challenge with a low profile device that moved

through 120 degrees of rotation with impressive speed. The award for the best portfolio went to Holycrest Middle School.

The Challenge, which is a partnership of the Canadian Fluid Power

Association ([www.cfpa.ca](http://www.cfpa.ca)) and the Toronto District School Board, is intended to provide Grade 8 students with hands-on experience building a mechanism with real world applicability and to open their eyes and

those of their teachers to the world of technology careers.

For more information, contact John Bachmann, CFPA Education Co-Chair, [bachmann.johnb@rogers.com](mailto:bachmann.johnb@rogers.com) and 905-607-9852.

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### News in Brief

#### Nova Instruments in Calgary

CD Nova ([www.cdnova.com](http://www.cdnova.com)) of Calgary has appointed Kevin Cyr as Canadian product manager of its Power & Energy Division. Cyr has over 20 years of experience in instrumentation technical sales.

#### Mitsubishi packaging website

Mitsubishi Electric Automation has launched a new website, [www.mitsubishipackaging.com](http://www.mitsubishipackaging.com), for the packaging machine community. The site is a dedicated resource that identifies common packaging challenges and how Mitsubishi Electric products are designed to overcome them.

#### TUV Rheinland chief regional officer

TUV Rheinland has named Gerhard Lubken chief regional officer, president and CEO of TUV Rheinland of North America, Inc. TUV is an independent testing, inspection and certification services company ([www.tuv.com/us](http://www.tuv.com/us)).

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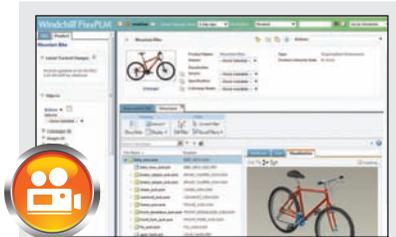
Hydraulic applications often require several different sizes and constructions of hose. To meet this demand, Gates hydraulic hose comes in an assortment of sizes and weights, with a wide range of temperature ratings and rated working pressures, various numbers and types of reinforcement layers, and diverse degrees of flexibility.

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A burst or pinhole leak in a hydraulic system can cause serious problems for anything or anyone within a 3-foot line-of-sight. Personal injury. Fluid burns and injection. Fires and explosions. Electrical shock. Mechanical failure.





## Windchill 10.1 integrates with Integrity

PTC has announced the latest version of its Windchill product life-cycle management (PLM) software, which is now also integrated with PTC's recently acquired Integrity software system lifecycle management technology. Integrating Windchill with Integrity is said to raise the bar for how manufacturers gather and manage requirements and trace related changes.

[www.ptc.com](http://www.ptc.com)

## SolidWorks eDrawings for iPad

With multi-touch gestures, eDrawings for iPad will allow users to zoom and rotate 2D and 3D models, animate and explode 3D views and view animate drawings from: SolidWorks 3D design software; DraftSight free CAD software; AutoCAD software; and DWG and DXF Files. eDrawings for iPad is now available on the Apple iTunes App Store.

[www.solidworks.com/edrawings](http://www.solidworks.com/edrawings)



## Mobile simulation app ForceEffect Motion

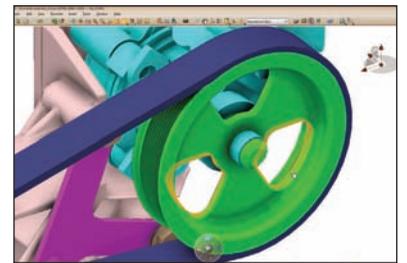
Autodesk, Inc. has announced that Autodesk ForceEffect Motion, a new mobile simulation app for developing and testing mechanical systems with moving parts (scissor lift, automobile engine, robotics, etc.), is now available on the App Store for iPhone, iPad and iPod touch. Realtime solving capabilities provide feedback on the system performance.

[www.autodesk.com/forceeffect](http://www.autodesk.com/forceeffect)

## Multi-version compatibility

Dassault Systèmes has released its Version 5 PLM platform, including CATIA, DELMIA, ENOVIA and SIMULIA. It furthers the adoption of the 3D Experience Platform designed by Dassault Systèmes and includes a new evolution in V6-to-V5 compatibility. OEMs or suppliers in all industries now have the flexibility to modify and exchange designs, whether they are V5- or V6-native, as they progress through the design process.

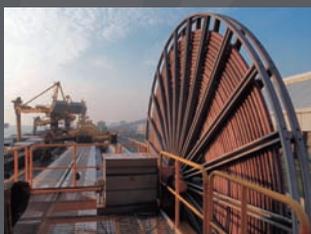
[www.3ds.com](http://www.3ds.com)



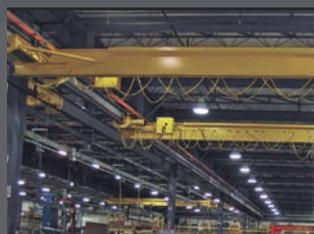
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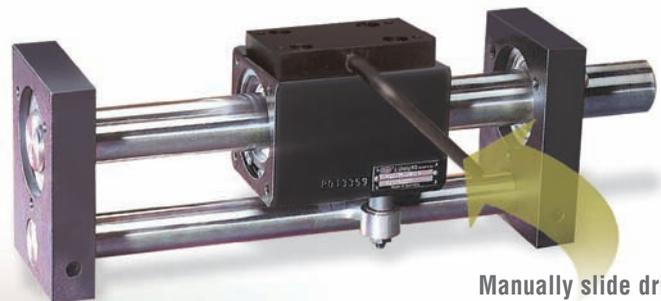
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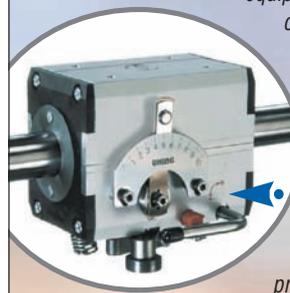
- Example applications: material handling machines, winding equipment, test and measurement devices, packaging & converting equipment.

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# Siemens conference connects the PLM dots

**P**LM – It’s Bird! It’s A Plane! It’s An Acronym! No, It’s An Abbreviation (for Product Lifecycle Management). The Siemens PLM Connection Event 2012 was held in Las Vegas at the Rio All Suites Resort & Casino last month with about 1800 attendees.

## With a good PLM system you can analyze warranty reports

Think of PLM as a document control system on steroids that runs the full gamut from initial market analyses, performance requirements, general specifications, preliminary designs, final design, vendor quotations, production documentation, component purchase orders, customer orders, production orders, quality control reports, warranty reports, sales figures, service and spares records, and so on right through to the when the product is withdrawn from the market and ultimately the final disposition of tooling and left-over component parts.

With a good PLM system you can analyze warranty reports, for example, to see if there is a relationship

between failures and the supplier of a specific component.

The main user portion of the event was given over to about 400 class-type presentations arranged along 45 tracks. The keynote and media-specific presentations generally fell along the lines of how important PLM is to the success of companies. Boeing, for example, monitor 849,140,000 part numbers for their commercial aviation division alone.

These presentations make it clear that management and control of your company data and information is becoming ever more critical in today’s world.

Speaking of today’s world, there were several items gleaned from several different presentations that caught my eye.

1. There are now more mobile devices on the planet than there are people.
2. Washers and dryers of the 1930s consisted of about one-third sheet metal, one-third heating elements, and one-third other materials. By 2010 those same three categories combined accounted for less than 20 percent of the total, with sen-



Russ Benson of Boeing pointed out that his commercial aviation division alone has to monitor close to 850 million parts using PLM.

- sors and information technology accounting for the rest.
3. The guidance computer in a 1966 Apollo moon rocket had 2 k of core memory, 32 k of “rope” memory, weighed 70 pounds, and cost a huge pile of money. A Hallmark electronic greeting card has 256 MB of memory, weighs a few ounces,

- and costs a toonie or so.
4. Your cell phone has more computing power than all of NASA put together had in 1969.
5. A Sony PlayStation has about the same power as a military supercomputer had in 1997.

The foregoing items were all used to indicate that the increasing complexity of today’s world and tomorrow’s products requires ever more powerful information control systems, and Siemens PLM products just happen to be available to do the job.

Okay, I’ll admit it. I played hooky from a couple of the last media sessions on Tuesday afternoon and snuck into a couple of sessions on NX. This is the Siemens high-end solid modeler, and it was the first time I’ve seen it in action. Most impressive!

This is the advantage of attending an event such as Siemens PLM Connection; you get to see real users doing real things, instead of watching the usual canned demo sales pitch.

### DPN

Bill Fane (bill\_fane@bcit.ca) is a software reviewer and former mechanical engineering instructor at BCIT in Burnaby, BC.

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## Bedside DNA test targets stent "rejection"

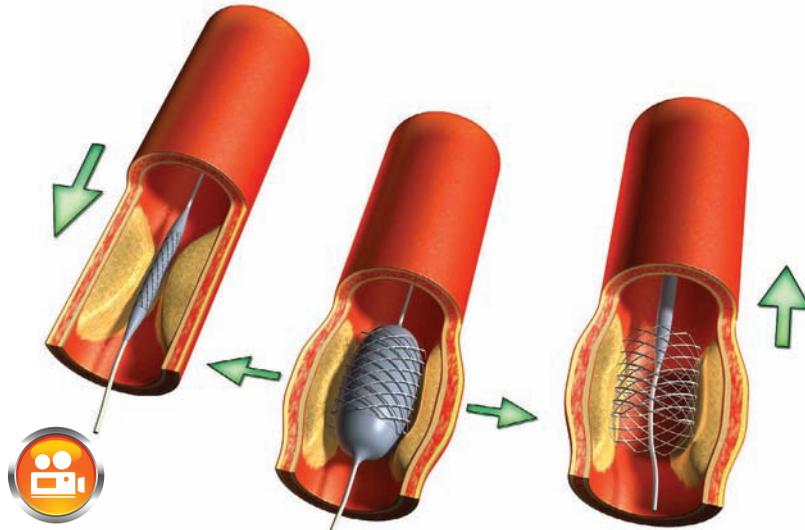
One condition that can stop a heart from pumping is a blockage to the circulation of blood around the body. A warning sign of an obstruction can be chest pains resulting from the dilation of an artery.

If the patient is taken to hospital emergency, this can be quickly verified by observing the progress of a luminous dye as it flows through the arterial system. If a point in an artery has narrowed and is causing an obstruction, a standard surgical procedure can relieve it with a device known as a stent.

A stent is a small cylindrical object with a reticular wall (right). The purpose of the stent is to be placed inside the narrowed section of the artery and expanded. When its ends are compressed, its walls expand.

The installation procedure involves entering the artery at a point near the surface of the body – usually the femoral artery. The procedure is known as angioplasty.

With the stent installed, the artery is open again to its full internal diameter and the blood is flowing freely. However, the presence of a stent in the system is not always a welcome alien. Platelets, the roughage compo-



A catheter with the stent – expanding mesh – on the leading end is guided into and along the artery to the narrowing section by a cardiologist.

nent of blood, can get hung up on it and form a new blockage.

So now, having addressed the offensive condition of a blocked artery, a defensive process is necessary to maintain a continuing benefit. This is achieved with pharmaceuticals – and the choice that can best suit the particular chemistry of the patient's blood in the presence of a stent is critical. Until recently it was a matter of observation. There was no rapid and empirical means of knowing if the patient carried

an at-risk variant in the blood that would negatively react to any particular drug and the elapsed time to find out could be detrimental or even fatal for the patient.

This critical and potentially life threatening period has been addressed and resolved by the world renowned University of Ottawa Heart Institute ([www.ottawaheart.ca](http://www.ottawaheart.ca)) and hailed as a breakthrough by journals such as *The Lancet*.

Dr. Jason Roberts, resident physician at UOHI and co-prin-

icipal investigator for a clinical trial known as Rapid Gene stated recently that "a pharmacogenetic approach to treatment carries the potential to maximize treatment efficacy while simultaneously minimizing harm to patients."

In collaboration with point-of-care DNA testing specialist Spartan Bioscience of Ottawa, ([www.spartanbio.com](http://www.spartanbio.com)) UOHI has developed a rapid bedside test that allows doctors to react much more quickly to make effective decisions about the potential pharmaceutical treatment.

Simply put: A saliva swab performed by clinical nurses at the bedside with no necessary prior training in genetic lab techniques, followed by a one step insertion of the swab into a testing machine – then, sixty minutes to identify if the patient carries an at-risk variant.

The point-of-care genetic test used in the study is a first in medicine and has overcome many of the previous obstacles that have hindered routine genetic testing. **DPN**

Mark Sunderland is President of Ottawa-based BioMedical Industry Group ([mark.sunderland@biomedgroup.com](mailto:mark.sunderland@biomedgroup.com)).

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ASCO Numatics has introduced the 8262/8263 Series two-way direct acting normally open solenoid valves with increased ac and dc pressure ratings and real-time online ordering. The Normally Open valves come in brass and stainless steel constructions with 1/8-, 1/4- and 3/8-in. pipe sizes and are used to control the flow of air, water, light oil, and specialty media such as vacuum, ammonia and oxygen.

[www.asconumatics.com](http://www.asconumatics.com)



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**Counterbalance cartridges leak-free**

Bosch Rexroth RS series counterbalance cartridges are said to provide leak-free load holding, stability, repeatability, and durability. The series is available in cavities such as T11A, T2A, T17A and T19A, as well as 4-ported versions. The cartridges operate to flows of 105 gpm at working pressures up to 6000 psi.

[www.boschrexroth.ca](http://www.boschrexroth.ca)



**W-style hose couplings**

Kurt Hydraulics has announced W-Style couplings compatible with low pressure braided hose and high pressure spiral hose. Designed for non-skive spiral hose to 6000 psi and wire braided hose applications, these couplings are available in sizes 4-32, non-skive all sizes of R12, non-skive 4SH 12-24 sizes, and a line of metric sizes.

[www.kurthydraulics.com](http://www.kurthydraulics.com)

# Primary motion on Democratic National Convention stage

Reconfigured ball screws move tons in a small footprint

As the dramatic and pivotal stage of the upcoming 2012 U.S. Republican and Democratic National Conventions approaches, streamlining the staging of the massive events historically has never been a small task. That was the case with Chicago Scenic Studios, Inc. (CSSI), a leading provider of scenic theatrical systems, who faced the daunting challenge of transforming the Boston Fleet Center into a spectacular convention hall for the 2004 Democratic National Convention.

## Engineered solution quickly, quietly lifts stage walls in a small footprint

One of the major engineering hurdles of the set design was the development of an automated system for the raising and lowering three main podiums, slip stages and monitor walls. The most technical challenge was vertically lifting and retracting two transparent, 300-lb podium backing acrylic walls, each of which contained a series of flat-panel video monitors within the top portion of the walls, so they can be hoisted away from the set with rigging.

CSSI enlisted linear motion control systems and components manufacturer Nook Industries to develop customized 50 mm ball screws that could lift loads upwards of 1000 lb quickly, quietly, and within an eight-inch footprint. Nook deployed their two-ton ActionJac ball screw jacks to efficiently lift the 300-lb walls over a travel length of 8 ft, as well as dampen vibration and resonance while sustaining a 6 ips lift speed to deliver the unique, fully automated set on time and on budget.

Each model in the ActionJac line incorporates a worm gear set arrangement that uses an alloy steel worm, which drives a high strength bronze worm gear (drive sleeve). The worm shaft is supported on anti-friction tapered roller bearings with external seals to prevent loss of lubrication.

The addition of a high efficiency ball screw and nut reduces the required input torque to approximately 1/3 the torque required for machine screw jacks. Used individually or in multiple arrangements, each worm gear screw jack is built to specification with customized travel lengths and reliable load handling capacities ranging from 1/4 ton to 100 tons.

With 16-foot high walls, and a 30-foot studio ceiling, CSSI needed a means for cutting the height of the wall in half by lifting and retracting the lower portion inside the upper portion so the collapsed eight-foot wall could be removed from or brought onto the set. This movement needed to be achieved relatively quickly (and quietly) to facilitate fast, uninterrupted set changes.

Essential to Nook's engineered solution was increasing the diameter of the lead screws and using a steep pitch thread pattern to provide



Nook Industries two-ton ActionJac ball screw jacks can efficiently lift 300-lb walls over a travel length of 8 ft.

the speed that was needed. Additionally, utilizing an oversized 50 mm shaft ensured that the screw would not vibrate or resonate while turning. The specially reconfigured 50 mm ball screws were then mounted in the sides of the upper wall.

To drive the screw jacks, the system incorporated a 2 hp, ac electric motor that raised the ball nut on the lower wall, and lifted

the wall completely. According to Mark Ewing, CSSI's head of automation, "we were able to automate every moving system, including the screw jacks used on the podium backing monitor walls, by tying them back to a PLC control with touch-screen integration." **DPN**

This article was contributed by Cleveland, OH-based Nook Industries. [www.nookindustries.com](http://www.nookindustries.com)

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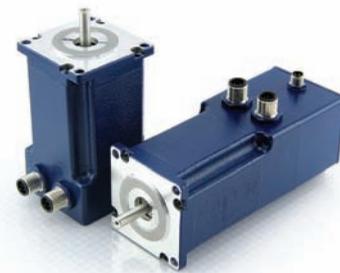
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## Traverse motion drives with linear pitch control

Amacoil/Uhing has upgraded its large sizes of RG traverse drives (225 to 800 lb of axial thrust) by adding a 100-notch scale to the pitch adjustment control, facilitating more precision in incremental linear movement.

[www.amacoil.com](http://www.amacoil.com)



## IP65 stepper motors

Nanotec Electronic, U.S. Inc. has announced models AS5918-EMN24 and AS5918-EMN24B, expanding its product line by adding IP-rated stepper motors with an integrated, magnetic 24 V encoder and, on the EMN24B model, an integrated brake. The option with a safety brake (1 Nm of holding torque) is typically used wherever vertical loads have to be kept in place even during a power failure or an emergency stop in order to prevent damage to persons or property. Featuring a holding torque of 1.98 Nm, the AS5918-EMN24 and AS5918-EMN24B stepper motors are viable alternatives to servomotors with gearboxes in Torque Mode and Closed Loop at low speeds. The motors are said to have a high degree of electromagnetic compatibility and feature M12 and M8 connections. With a flange dimension of 56 mm (NEMA 23), they are compatible with all Nanotec stepper motors and thus can be used in mixed environments.

[www.nanotec.com](http://www.nanotec.com)

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## Pittman Motors website launched

Pittman Motors, a manufacturer of customized dc brush motors, brushless motors, and gearmotors, has launched [www.pittman-motors.com](http://www.pittman-motors.com).

The site has a new look and feel as well as enhanced features such as tabbed navigation and access to online ordering for immediate availability of a standard selection of parts. The website also allows a visitor to download CAD models for virtual prototyping.

[www.pittman-motors.com](http://www.pittman-motors.com)

## Bus terminal I/O manual operating modules mount outside cabinet doors

In order to provide more convenient interface options for machinery, Beckhoff Automation has introduced the new KL85xx manual operating module series. The modules mount on the outside of control cabinet doors using a snap-in system. In addition to easy manual machine intervention without opening the control cabinet, these digital and analog I/O modules also enable the convenient observation of process data.

[www.beckhoffautomation.ca](http://www.beckhoffautomation.ca)



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## Snap-acting detection

C&K Components has announced that it has extended the operating life of its micro-miniature snap acting detect switch to 100,000 actuations. Available in four surface mount options, the MDS series is also available in vertical and right-angle PCB mount and through-hole versions.

[www.ck-components.com](http://www.ck-components.com)



## Expanded viewing LCDs

NKK Switches has enhanced the design of its SmartSwitch LCD product line to feature what it says is the largest viewing area to cap size in the industry. The wider screen LCD SmartSwitch devices are available for both the 64 x 32 and 36 x 24 resolutions. The programmable pushbuttons include RGB LED backlighting.

[www.nkkswitches.com](http://www.nkkswitches.com)



## Managed Ethernet switches

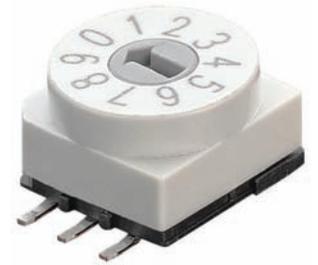
The AutomationDirect line of Stride Ethernet products now includes industrial-grade managed Ethernet switches, designed with redundant power inputs with surge and spike protection and auto-crossover. Built with aluminum housings, all models are designed for an operating range of -40° to 75°C.

[www.automationdirect.com/managed-switches](http://www.automationdirect.com/managed-switches)

## Rotary coded DIP switches in SMT and through-hole configs

APEM Components, represented in Canada by Xtronics, has introduced the P65 series of rotary switches, a high temperature version of its PT65 dual in-line package (DIP) coded rotary switch. The series is available in both SMT and through-hole. The contact paths have abrasion-resistant gold plating. With a mechanical lifetime of 30,000 steps, and is available in 4, 6, 10, and 16 positions. The switches are 6.5 x 10 x 10 mm (H x W x L).

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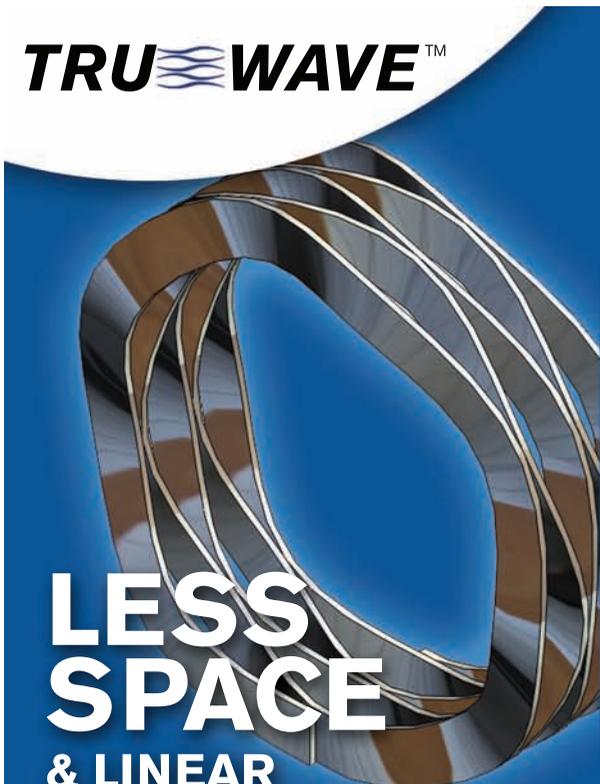
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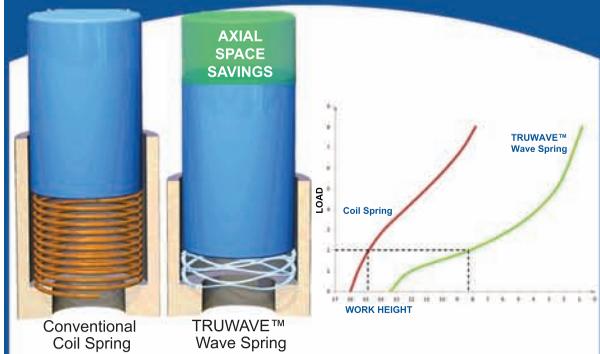


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# Airless tire quest revived

Bridgestone and others haven't given up on a non-pneumatic solution

The pneumatic tire was invented by a Scot named Robert Thompson who patented his "elastic bearing" to "present a cushion of air to the ground" in 1845.

But it fell to another Scot, veterinarian John Boyd Dunlop, to "re-invent" the pneumatic tire in 1887 (his patent was later rescinded when Thompson's was discovered) in time for the safety bicycle craze. Dunlop's successful air-filled tire had much lower rolling resistance and an immeasurably better ride.

Today's tires have a high level of performance but they can still lose air and go flat, immobilizing the vehicle. Engineers have tried overcoming this with run-flat tires, but they present their own problems such as weight, heat and a harsher ride.

In this quest to eliminate flat tires and maybe even provide better vehicle handling and increased tread life, Michelin developed its "Tweel" (combination tire and wheel) airless tire that it announced in 2005. It had a thin reinforced outer band, like a tread or belt, and flexible plastic vee-shaped spokes that were attached to a small inner wheel. The load was supported by these spokes, rather than by compressed air.

Track testing was conducted with Tweels on an Audi A4, and apart from any technical advantages, the see-through wheels certainly attracted attention. Although optimism prevailed, it reportedly had such problems as excessive heat and noise, and higher rolling resistance than pneumatics.

Now another tire giant, Japan's Bridgestone Corp., has entered the airless tire arena with its "Air-Free" tire introduced at the 2011 Tokyo Motor Show. While still in the developmental stage, Bridgestone demonstrated 25 cm diameter Air-Free tires performing on light golf

cart-like vehicles. Each tire-wheel can support 150 kg, and it brought back memories of the wheels on NASA's Lunar Rover.

Bridgestone's concept is similar to Michelin's Tweel in that the chamber of compressed air is replaced with a matrix of curved and interlaced thermo-plastic spokes between a reinforced rubber outer band and a small aluminum inner wheel. These spokes flex with wheel rotation to provide good ride qualities and vehicle dynamics, and can be engineered for different responses such as a more compliant ride or higher lateral stiffness for better vehicle handling. Work is progressing on scaling up the size for regular motor vehicles.



Bridgestone has demonstrated 25 cm diameter Air-Free tires performing on light golf cart-like vehicles.

Another player is Clemson University in North Carolina, where engineers are working on a heavy-duty, non-pneumatic tire for the military Humvee utility vehicle. It uses a heavy black rubber-like tread and plastic, geometrically shaped spokes.

A different approach to the non-pneumatic tire has been taken by Delaware-based New Tech Tire Corp., a division of Scitech Industries. Rather than wheels with flexible spokes, Tech Tire's airless tire replaces the compressed air in a conventional tire with internal fiberglass ribs. Many advantages are claimed over the Tweel and Air-Free tires, including the ability to build it on conventional tire manufacturing machinery. Also, it is said to weigh the same as a pneumatic tire and can be mounted on a standard rim using regular tire shop equipment. New Tech says it has successfully lab tested its airless tire at typical highway loads and speeds for 10 hours. **DPN**

Bill Vance is a founding member of the Automotive Journalists Association of Canada (AJAC) and author (bvance1@cogeco.ca).



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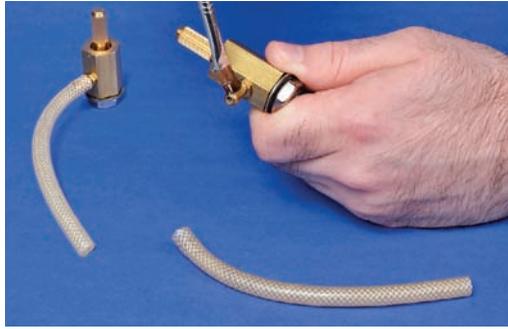
Type HFE steel self-clinching studs from PEM designed with large-diameter heads install permanently in steel or aluminum sheets as thin as .040 in./1 mm with hardness of HRB 85 (or less) and HB 165 (or less). Thread sizes range from #10-32 through 5/16-18 and M5 through M8. Stud lengths are available up to 2 in./50 mm.

[www.pemnet.com](http://www.pemnet.com)

## Self-locking cotter pins

Pivot Point has introduced the SLIC Pin self-locking implanted cotter pin. The spring-loaded plunger is said to feature easy insertion ramp and the vertical face at rear prevents backing out. The patented design is suitable for blind holes or where cotter pin access is limited. The pin can be made to specification, including: special wedge shapes, different pin/head styles, various finishes, steel, alloy and stainless.

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# Hannover Messe 2012: New business powered by green technologies

**H**ANNOVER, GERMANY – Hannover Messe 2012 delivered “All the right topics, a further rise in participation from abroad and highly satisfied exhibitors – this year’s (event) added up to a complete success,” said Dr. Wolfram von Fritsch, chairman of the managing board of Deutsche Messe, at the press conference on the last day of the show. “Hannover Messe 2012 has triggered a new wave of business for industrial enterprises. The show’s 5000 exhibitors will now have their work cut out for them.”

The five-day event in late April attracted nearly 185,000 attendees.



Volkswagen was offering test drives around Hannover Messe grounds in a small fleet of its all-electric Golf Blue-e-Motion e-car.

By focusing on the keynote topic of “greentelligence,” The trade fair made three major points: “Green

technologies are a viable business model with the power to drive growth around the world. Industry has the solutions needed for achieving sustainability in manufacturing. And green technology can translate into higher profitability for industry,” declared von Fritsch.

The “green” appeal of the show was partly reflected in electric vehicles and related technologies. Volkswagen demonstrated its expertise at an extensive booth and offered test drives of the show grounds in the all-electric Golf Blue-e-Motion vehicle. Phoenix Contact ([www.phoenix-contact.ca](http://www.phoenix-contact.ca)) won the prestigious “best

in show” Hermes 2012 Award for its wind turbine lightning monitoring system and demonstrated “e-fuel” connectors in its product showcase.

Just how far do exhibitors anticipate the growth of e-vehicles? Philip Harting (videobelow), senior vice president of Harting Inc. ([www.harting.ca](http://www.harting.ca)), whose headquarters in Espelkamp, Germany, already boasts four electric vehicles for inter-factory travel in the region, said “I assume my next car will be an e-car because from my home to the company is only 12 to 15 km. Then I can charge the battery at home or at the company.”

## WATCH Hannover Messe 2012 executive interviews and booth tours at [dpncanada.com](http://dpncanada.com)

### Turck displays rotational position sensors



Andre Brauers, Turck Industrial Automation product manager for linear position sensors, encoders and inclinometers, describes the latest in rotary position sensing technology. <http://ow.ly/aXw8D>

### Phoenix Contact wins “best in show” Hermes Award



Paul Bastel, sales operations and communications manager at Phoenix Contact Canada, described the wind turbine lightning monitoring system that won the prestigious “best in show” Hermes Award. <http://ow.ly/aXxdC>

### EPLAN Engineering Center One documentation standardization



Mechatronic solutions consultant Sean-Patrick Mulherrin of EPLAN Software & Services North America demonstrates the new EPLAN Engineering Center One (EEC) design and assembly software functionality. <http://ow.ly/aXwyH>

### Festo chairman sees common engineering approach



Dr. Eberhard Veit, chairman of the Festo AG management board, commented on how similar engineers are in Europe and Canada and how his company is addressing energy savings for its customers. <http://ow.ly/aXxBT>



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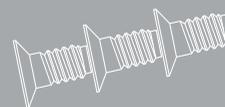


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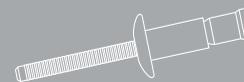
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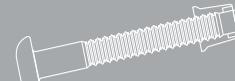
### Avdel® Blind Fastening Systems



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### Blind Threaded Inserts



### Rittal enclosures booth tour displays energy conservation



Bernd Hanstein, VP Product Management System Solutions, Rittal GmbH & Co., points out “tool-less” modular enclosure systems for IT applications, a seamless hanger system for HMI computers/monitors and cooling system offerings. <http://ow.ly/aXwp4>

### Philip Harting interview reveals environmental concerns



Philip Harting, senior vice president of Harting Inc., spoke about its emergence on the global stage, the need for corporate governance on carbon dioxide emissions and on energy management technologies. <http://ow.ly/aXxtj>



### HMI support arm systems

Rittal Systems has introduced its support arm system 60/120/180. With support arm systems, control panels can be easily and accurately turned, lifted and swiveled, the company says. The systems can be created for the 60, 120, and 180 kg load levels (relative to a jib length of one metre) with a uniform function, installation and project planning system.

[www.rittal.ca](http://www.rittal.ca)



### Redundant Profinet

A redundant control system for Profinet can be created with the new RFC 460R PN 3TX controller from Phoenix Contact. This is said to make it possible to reduce system shutdowns and prevent dangerous situations, for example, in tunnels or airports.

[www.phoenixcontact.ca](http://www.phoenixcontact.ca)



### Lightweight bionic grippers

With the NanoForceGripper, engineers from the Festo Bionic Learning Network have developed a gripper whose suction cup-like components are modeled on the pads of a gecko. Units are said to cling reliably and permanently to the surfaces of the object to be gripped because of tiny, intermolecular forces of attraction.

[www.festo.com/bionic](http://www.festo.com/bionic)

### Circuit board connection provides up to 60 A rating

Han-Fast Lock from Harting is designed to provide a quick, user-friendly circuit board connection. Units can connect up to 60 A to a circuit board. A pre-assembled contact is fitted to the prepared circuit board and the pin provided is engaged to lock the circuit board.

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# Rotary ball spline technologies face off

What is a 'crossed roller bearing' rotary spline nut? By Naoki Yamaguchi

Crossed roller bearings work similarly to ball bearings, except that the bearings housed within the rotary nut are cylinder-shaped instead of ball shaped. The rollers crisscross each other at a 90° angle and move between “V” grooved bearing ways or grooves ground into the spline nut outer diameter and rotary flange attached on the nut.

Crossed roller bearings offer a line of contact versus a ball bearing's points of contact, thereby creating a broader contact surface that can carry a heavier load. This provides more rigidity, less deformation and thus more accuracy compared to the point contact of balls. Because of this, crossed-roller bearings are the most accurate form of mechanical motion component.

As rotary support bearings, both angular contact bearings, which ride on balls, and crossed roller bearings can support both axial load and radial load as both types of loading or combined loading can be expected depending on ball spline applications. An angular contact bearing achieves this with two rows of balls whereas a crossed roller bearing can

do this in a single row, but with some disadvantages such as speed and wear.

When comparing dimensions, one is immediately struck by the difference in size between a rotary ball spline (RBS) whose rotary support bearing rides on ball bearings, i.e. an angular contact bearing. On the spline shaft, the spline nuts are basically the same.

In each case, they ride on ball bearings.

The RBS whose rotary support bearing rides on crossed roller bearings is much more compact. The reason the crossed roller bearing supported rotary ball spline takes up so much less space is that the rotary nut and spline shaft is one unit. The crossed rollers are directly attached to the spline nut's outer cylinder. In addition,

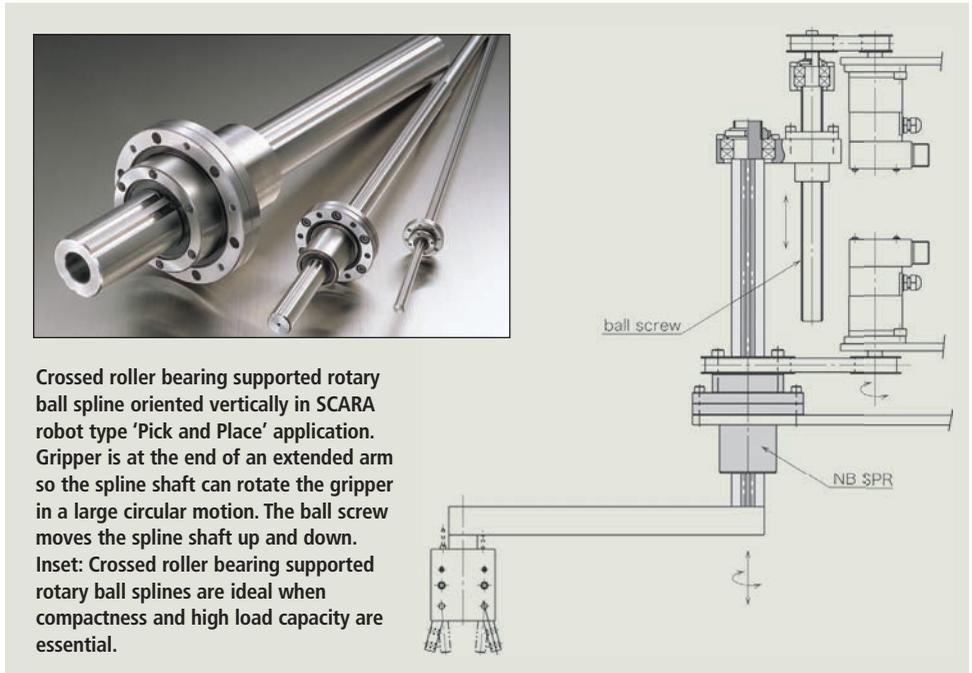
the crossed roller rotary support bearing is thinner.

Crossed rollers provide a larger contact area than ball bearings, reducing elastic deformation. Because of this greater stiffness, crossed rollers provide consistently precise movement. There is a direct correlation between the con-

tact area of the crossed rollers and load capacity. Load capacity can be increased greatly by roller-to-raceway contact. Balls typically make contact at 2 to 4 points.

For applications that continuously rotate, crossed rollers wear out more quickly than ball bearings. In a rotational speed comparison, the angular contact type is more advantageous than the crossed roller type. Comparing the two types at a standard 16 mm (the diameter of the spline) size, the crossed roller type nut is capable of 1080 rpm vs. the maximum rotational speed for an angular contact type nut (4000 rpm).

Since crossed roller rotary nut technology is newer, most existing applications already use the angular contact bearing supported ball spline. That makes changing to the newer technology expensive since it's not the same size – it's more compact. However, most angular contact bearing supported ball splines are interchangeable, size-wise. Though outer dimensions of interchangeable rotary ball splines may be the same, there are design advantages to consider such as the number of grooves on the spline, the points of ball contact within the grooves and shaft rigidity. **DPN**



Crossed roller bearing supported rotary ball spline oriented vertically in SCARA robot type 'Pick and Place' application. Gripper is at the end of an extended arm so the spline shaft can rotate the gripper in a large circular motion. The ball screw moves the spline shaft up and down. Inset: Crossed roller bearing supported rotary ball splines are ideal when compactness and high load capacity are essential.

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Naoki Yamaguchi is Assistant Technical Manager at NB Corp. of America (naoki@nbcorporation.com). [www.nbcorporation.com](http://www.nbcorporation.com)

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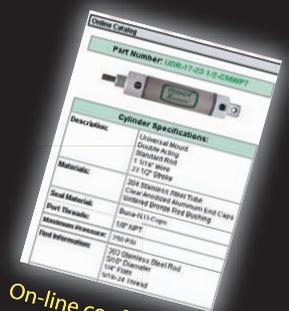


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