Inside: Power Transmission ■ Sensors ■ Enclosures ■ CAD Software

See Video Highlights dpncanada.com/video

DPN DESIGN PRODUCT NEWS

Covering the total design engineering function in Canada

November/December 2011

IP69K-rated inclinometers

Posital Accelens (ACS) inclinometers from FRABA are now available in IP69K, fibre-reinforced PBT plastic housings with encapsulated electronic components, as well as enclosed in die-cast aluminum housings. Both variants of the ACS inclinometers are available as single axis (360°) or two-axis (±80°) models.

www.fraba.com

3D software adds functions

Dassault Systèmes SolidWorks Corp. has released SolidWorks 2012, a 3D design application with assembly and drawing capabilities, built-in simulation, design costing, routing, image and animation creation and product data management. Over 200 user-driven enhancements have been incorporated.

www.solidworkslaunch.com

Intelligent actuator system

The Wittenstein ternary actuator integrates controller, motor, amplifier and drive. For rotary motion, the basic device can be used alone or paired with an alpha gearbox. For linear requirements, a ballscrew or slider is added to the device.

www.wittenstein-us.com

Volume 39 Number 6

INSPIRED rugged tablet design

Industrial design contributes vision for field technician tablets

Using creativity and ingenuity, the Almex Group patented a new machine press for splicing conveyor belts with a unique pressure bag system back in 1962. Its design revolutionized conveyor belt press machines and established Shaw Almex as an industry leader (www.almex.com).

In its leadership role today, Almex puts a strong emphasis on bringing new products to market that will better serve the industries that use its machines. With nine corporate facilities and a network of distributors, Almex is strategically located on five continents and provides service to over 120 countries around the world.

Almex contacted IDWS Inc. industrial design firm (www.idws.ca) to help it develop stylized and functional approaches to its next generation of machines. IDWS has assisted in the development of a combination of new products – the Quantum Press, the SG1 (switch gear electrical control box) and a rugged Android tablet (to become the control centre for the three). All of these products have a "family" resemblance around an Almex "X" theme to provide an appearance of toughness, as these products are used in some of the harshest environments in the world, such as the mining sector where conveyor belts are a prime method of material logistics.

The creative focus behind the design of the tablet was to differentiate it for a group of technicians who might just be more comfortable working with a set of tools than working with a computer. The tablet could not look like a child's toy, so the tablet housing made of aluminum, plastic and polyurethane blends for gaskets, buttons and shore 'D' handles had be designed for extreme weather applications, drop falls, dust and moisture protection guidelines such as IP54 (Ingress Protection).

Continued on page 6

PM# 40065710 Return Undeliverable Canadian Addresses To Circulation Department P.O. Box 530, Simcoe ON N3Y 4N5

Where do I go for Data Acquisition Products?

omega.ca, of Course!

Your single source for process measurement and control products!

Où puis-je troOù puis-je trouver des produits de saisie des données?

Sur omega.ca, bien entendu!

Votre source unique en produits de mesure et de contrôle des procédés

Four Virtual Instrument Applications: Strip Chart—Oscilloscope—Function Generator—Rate Generator

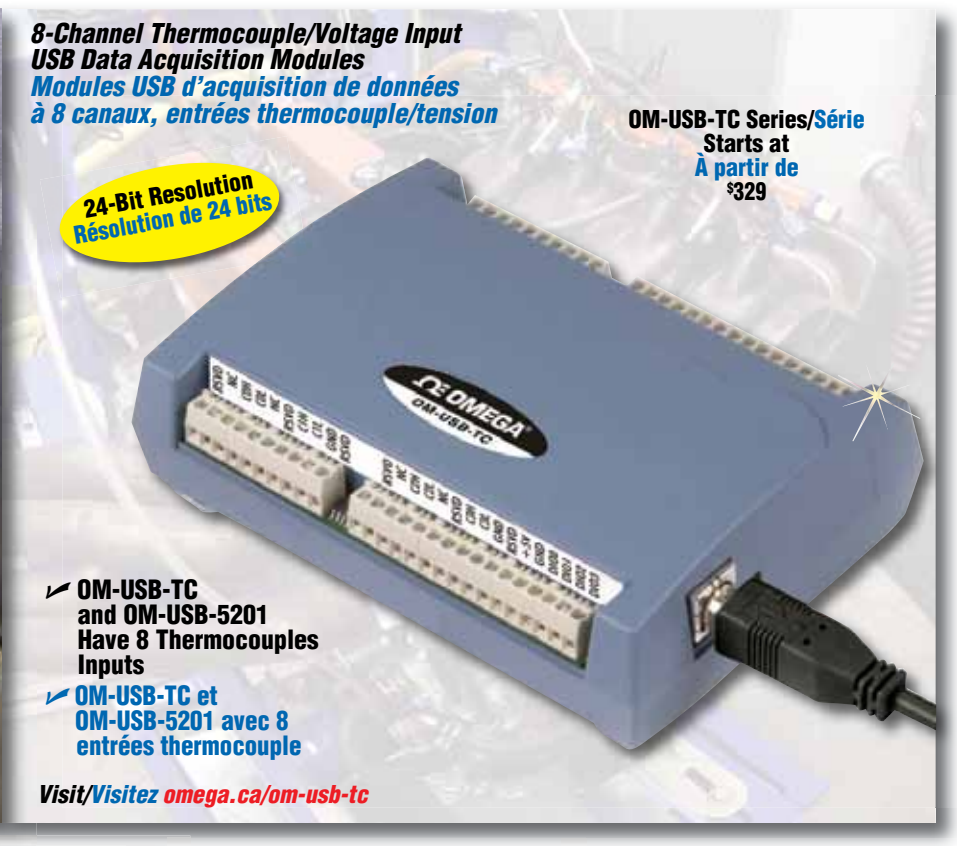
Quatre applications d'instruments virtuels: Enrregistreur à bande déroulante - Oscilloscope - Générateur de Fonction - Générateur de Fréquence

8-Channel Thermocouple/Voltage Input USB Data Acquisition Modules

Modules USB d'acquisition de données à 8 canaux, entrées thermocouple/tension

OM-USB-TC Series/Série
Starts at
À partir de
$329

24-Bit Resolution
Résolution de 24 bits



- **OM-USB-TC and OM-USB-5201 Have 8 Thermocouples Inputs**
- **OM-USB-TC et OM-USB-5201 avec 8 entrées thermocouple**

Visit/Visitez omega.ca/om-usb-tc

Long Distance Industrial Wireless Transmitters and Receivers

Transmetteurs et récepteurs industriels longue distance sans fil

UWXL Series/Série
Starts at/À partir de
$395

Up to 450 m (1500') Line of Sight Range

Portée en ligne visuelle de 450 m (1500 pi)

Visit/Visitez omega.ca/uwxl

Thermocouple Data Logger with LCD Display and USB Interface

Enregistreur à thermocouple avec ACL et interface USB

OM-EL-USB-TC-LCD
$100

Visit/Visitez omega.ca/om-el-usb-tc-lcd

Wireless Sensor System Ethernet or Internet Connection

Système de sondes sans fil Connexion Ethernet ou Internet

Visit/Visitez omega.ca/zseries

zSeries/Série
Starts at
À partir de
$95

FREE!

gratuite!

Over 150 full color pages covering 7 product categories in automation, sanitary, temperature, electric heaters, wireless/data acquisition, pressure and flow

Plus de 150 pages en couleurs couvrant les 7 catégories de produits suivantes; automatisation, sanitaire, température, éléments chauffants électriques, acquisition de donnée/sans fil, pression et débit

Environmental Surveillance Over the Internet

Surveillance environnementale sur Internet

Visit/Visitez omega.ca/isd-th

iSD-TH Series/Série
Starts at
À partir de
$495

Portable Data Logger

Enregistreur de données portatif

OM-SQ2010 Series/Série
Starts at
À partir de
$1540

Visit/Visitez omega.ca/om-sq2010

Transition Joint Thermocouple Probe

Sonde à thermocouple à joint de transition

TJ-USB Series/Série
Starts at
À partir de
$95

Visit/Visitez omega.ca/tj-usb

www.dilbert.com scottadams@aol.com

© 2004 Scott Adams, Inc./Dist. by UFS, Inc.

For Sales and Service, Call TOLL FREE

pour les ventes et le service - composez

1-888-82-66342℠

1-888-TC-OMEGA

Dilbert © United Feature Syndicate, Inc.

976 Bergar
Laval, Québec
Canada H7L 5A1

Because of transmission frequency regulations, these wireless products may only be used in the United States and Canada (915 mHz models) or Europe (868 mHz models).

En raison de la réglementation des produits de fréquences de transmission, ces produits ne peuvent être utilisé qu' aux Etats-Unis et aux Canada (915 modèles MHz) ou en Europe (868 modèles mHz).

OMEGA®

Improve your process AND save money

It's time to try AutomationDirect!

ProSense electronic pressure and vacuum sensors are a solid-state solution to problems with mechanical switches

PSD25 PRESSURE SWITCHES

- Available in 145, 1450 and 5800 psi ranges
- Simple setup using rotating adjustment dials
- No moving parts in sensing technology ensure long-term stability without setpoint drift
- No calibration required
- LEDs indicate switching and operating status
- Dual switching DC output via micro connector
- Vibration and shock-resistant

PTD25 PRESSURE TRANSMITTERS

- Pressure models available in 15, 30, 100, 200, 500, 3,000 and 5,000 psi ranges, with 4-20 mA or 0-10V output options
- Vacuum models measure up to 29 inches Hg, or 0 to 100 inches water column, with 20-4 mA or 10-0V output options
- Ceramic sensing element provides high burst/overpressure protection
- Analog output via micro connector
- Flexible film circuit results in compact size with excellent shock and vibration resistance
- Robust stainless steel housing

www.automationdirect.com/pressure-sensors

Also Available

Current Sensors

Solo™ Process Controllers

Signal Conditioners

Digital Pressure Switches / Pressure Transmitters

Our shipping policies make it easier than ever to order direct from the U.S.!

Free standard shipping is available for orders totaling over $300 U.S. (except for orders which require LTL shipping, see Web site for details). Also, save on brokerage fees when shipping standard ground to Canada - you can choose to allow AutomationDirect to nominate a broker for your shipment for parts shipping via standard ground. This can save you big on brokerage fees. See Web site for details and restrictions -

www.automationdirect.com/canada

www.automationdirect.com

Go online or call to get complete information, request your free catalog, or place an order.

1-800-633-0405

Order Today, Ships Today!*

* See our Web site for details and restrictions.

VOTED #1 Best in SERVICE 11 YEARS

AUTOMATIONDIRECT.com

the #1 value in automation

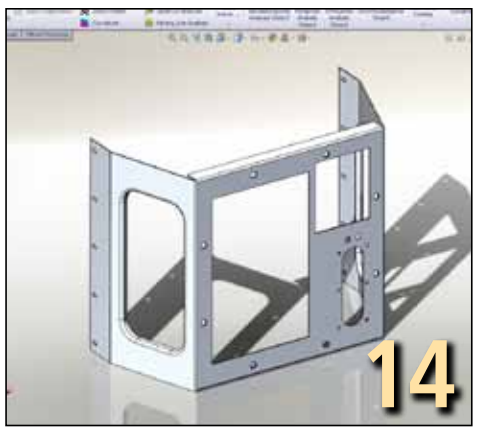
In this issue

Family-run Harting creates Canadian subsidiary

Now into its third generation of family ownership, the connectors and networking product manufacturer Harting Technology Group of Germany has just opened a Canadian subsidiary.

MapleSim math software supports hockey robot

MapleSim software from Maplesoft has allowed Hockey Robotics to efficiently and accurately simulate the coupled dynamic electrical and mechanical behavior of the SlapShot XT robot.



Bill Fane puts SolidWorks 2012 to the test

SolidWorks 2012's Costing functionality adds a significant new analysis tool to help designers in this regard. Designers can analyze machined or sheet-metal parts to estimate their manufacturing cost.

3D haptic and printing tools support medical market

Using 3D tools, medical engineering design company Protowerx has produced a three dimensional replica of a maxillofacial (jaws and face) model, according to Mark Sunderland.

DEPARTMENTS:

THIS MONTH ON dpncanada.com

EXCLUSIVE ONLINE BLOGS

CAD Software Blog
Motion optimization functionality part of Bill Fane's deeper dive into SolidWorks 2012

Renderings Blog
Mike Edwards ponders RIM's shot heard 'round the world and the value of its patents

Advertisers Index

WATCH new product demos from the world of design engineering at *dpncanada.com*

Video highlights at *dpncanada.com* reveal experts demonstrating methods that address design engineering, manufacturing automation and mechatronics.

Computing Consortium step forward for research and innovation

CLUMEQ High Performance Computing Consortium is the most powerful supercomputer in Quebec and the second-most energy-efficient data centre in Canada.
http://ow.ly/7fLEW

Festo Mobile Mechatronics Lab demos multi-axis material handling

Rich Dirker, Electric Drive Specialist, explains the various material handling options available from Festo for manufacturers on its Mobile Mechatronics Lab.
http://ow.ly/7fLP3

How Synchronous Technology drives NX modeling and simulation software

Jim Rusk, VP, Digital Simulation Solutions, Siemens PLM Software, explains how Synchronous Technology helps to drive functionality inside NX design and simulation software.
http://ow.ly/7fLX6

DPN DESIGN PRODUCT NEWS DIGITAL EDITION

November/December 2011

Please go online to dpncanada.com to fully explore and enjoy the Digital Edition of *Design Product News*. This user-friendly new format, with every item linked to other websites, videos and 3D PDFs, will help you get even more invaluable design engineering information from *DPN*.

DPN editorial director Mike Edwards

dpncanada.com

Interactive stuff

Notice that as you move your mouse over certain parts of the magazine or over the DPN 3D and video player buttons, in some editorial stories and in some advertisements, a grey box appears. That means you are one click away from a new window opening up that takes you to a website or rich media we've linked to.

Renderings

The trouble with normal – it only gets worse

By Mike Edwards, Editorial Director

Last month, I was scheduled to take part in a media tour of manufacturing in Thailand, with stops at Celestica, GM and Ford on the agenda. The flight *was* booked, my anticipation rose – but so did the floodwaters in that now beleaguered Asian nation.

And poor old Honda and Toyota Canada, the supply chain hit once again. According to a statement from Honda Canada on Halloween (a cruel "trick" this year), "Honda will temporarily adjust automobile production at all six Honda auto plants in Canada and the U.S. Currently, it is anticipated that this situation will require adjustments for the next several weeks."

Thailand flooding adds another shock to the global supply chain

A family friend who supervises tool and die operations at the Alliston, ON, Honda plant bemoaned yet another work disruption on the heels of the Japan Tsunami tragedy earlier in the year. Just as production in Alliston was getting back into high gear!

"Many automakers are considering establishing alternative supply networks by temporarily moving production elsewhere or procuring parts from other places such as Japan," IHS Global Insight auto analyst Paul Newton told The Associated Press.

Here at home, however, the economic news was positive from Canada's export agency on the same day as Honda Canada's statement.

Export Development Canada is sounding an optimistic note for the prospects for one of the economy's most critical sectors that stands in sharp contrast to the distinctly bleak outlook of the Bank of Canada and other forecasters, according to The Canadian Press (CP).

The agency said that shipments to the rest of the world are holding up well this year in the face of a global slowdown, and will likely do so again next year with gains of 11% and 7% respectively.

In its latest review of the global economy the previous week the Bank of Canada blamed exports, which represent about one third of the economy, as the primary reason Canadian growth will slow to below one per cent in the last three months of 2011 and remain modest at 1.9 per cent in 2012.

But EDC disagrees with the assessment, judging that exports will add 2.3 per cent to Canada's gross domestic product performance this year and 2.4 next.

"Canadian exports have been remarkably resilient,'" EDC chief economist Peter Hall told CP. "The recession wiped out one quarter of our trade, but by mid-2012, we will have recovered all of the momentum lost.'"

The bank's analysis, supported by many private sector economists, is that market turmoil brought about by European debt issues, weakness and political gridlock in the U.S., and slowing growth in emerging economies, will soften demand for what Canada sells the world.

One of those economists told the Electro-Federation Canada 2012 Economic Forecast conference (www.electrofed.com) earlier in the fall that Canada's manufacturing economy is likely to experience slow growth over the next year or two.

In her Global Economic Outlook presentation, Maureen Farrow, president of Toronto-based Economap Inc., said that a "lack of governance" in the Europe and U.S., has contributed greatly to the economic crisis. "They have to get sovereign debt off of the balance sheets. Unless the Martians come down to buy it up," they will have to do it themselves.

While Canada's debt burden isn't too bad, Farrow said that real GDP growth in Canada will be affected by slowed global growth and probably hover in the 2% range through 2013.

Cover Story

Industrial design adds vision to Almex family of products

From Front Page

Some of the key features designed into the tablet would be done to appeal to this demographic, such as large handles for work gloves and large tactile response buttons. A number of these buttons placed on the case represent physical apps created for instant access to various functions required in the field, such as a camera, torch light, notes and spread sheet documents to help on site work. There is even a lone worker safety 911 button placed on the housing, a must have in case of an emergency.

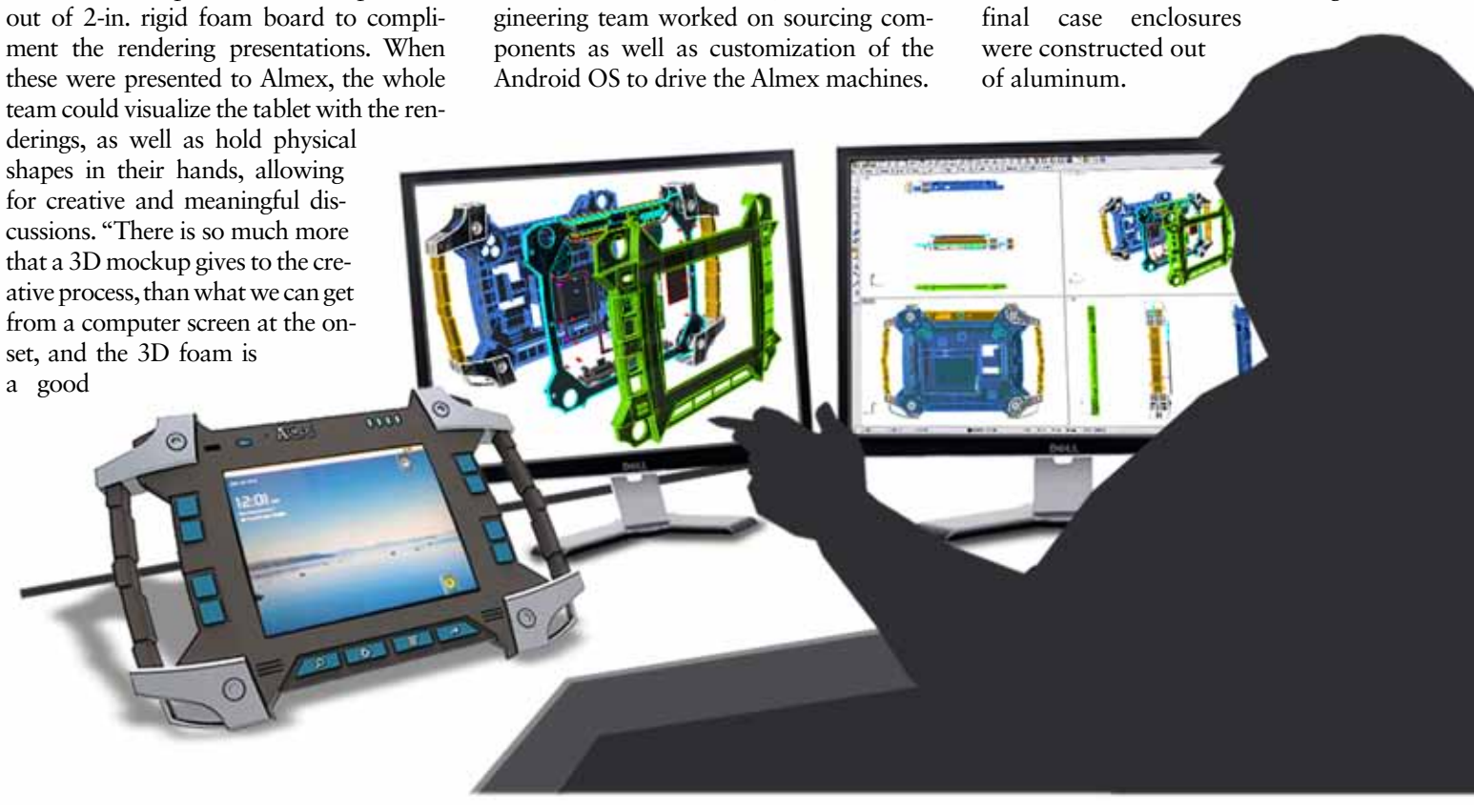
Featured-packed tablet design required a whole team effort between Almex, IDWS

Other important features are the 10-in. sunlight readable tablet touch screen with the ability to control the machine press heating and cooling systems, turn-by-turn GPS navigation with extended range Wi-Fi, high powered torch LEDs to shed light in dark places, 5 megapixel camera, bar code scanner, GSM mobile phone, employee tracking and monitoring and a biometric security sign-in functionality. To get all of this into one package required a whole team effort between the Almex Group and IDWS – everyone from field techs, mechanical and electronic engineers to industrial designers and various levels of management – to assist in forming the rugged tablet criteria.

So with these targets set out, the IDWS studio started creating a series of concept sketches to explore various shapes, handle schemes and button configurations. From there IDWS sculpted four mock-up tablets out of 2-in. rigid foam board to compliment the rendering presentations. When these were presented to Almex, the whole team could visualize the tablet with the renderings, as well as hold physical shapes in their hands, allowing for creative and meaningful discussions. "There is so much more that a 3D mockup gives to the creative process, than what we can get from a computer screen at the onset, and the 3D foam is a good indicator of being on the right track before time investment starts in 3D CAD development," said David Duncan, principal at IDWS Inc.

From these foam mock-ups, Almex gave clear direction to focus in on, and early CAD shapes were developed at IDWS using Rhinoceros 3D freeform surfacing CAD and SolidWorks 3D CAD solid models. While at the same time, the Almex engineering team worked on sourcing components as well as customization of the Android OS to drive the Almex machines.

This tandem process helped to reduce time, as IDWS had the ability to import the sourced component files into the CAD assembly, and could design-in product scale and fastening positions. A number of physical prototypes were developed, and the tablet went through Alpha and Beta testing. Some early tablets were built using SLS rapid prototyping while others were made with RTV molding. The final case enclosures were constructed out of aluminum.



Advisory Board Directions

Engineering collaboration across continents requires data coordination

By Mirek Tokarz

Close collaboration between businesses that have evolved in different geographical locations presents challenges on many levels. Besides basic compatibility issues around software platforms and IT infrastructures, differences in internal manufacturing processes need to be addressed.

For the Langen Packaging Group, changing our approach to managing resources was a clear opportunity. Instead of running two separate engineering departments in each location, one engineering resource pool was established.

Initially an overload in one location was handled by temporarily relocating engineers from the other location. This was reasonably effective, but also costly.

To improve on this solution meant leveraging more than 20 years of experience in software automation in the design and manufacturing processes. The objective was to establish an infrastructure that is indifferent to where the design is executed. An engineer can sit in Holland and work on a Canadian project from his desk; a design completed in Holland can be released for manufacture in Canada.

Change is messy and hard work. An open mind is essential along with a willingness to see the merits in the other guy's approach or, where appropriate, a completely new approach. A clearly articulated, challenging objective keeps everybody focused.

We considered two approaches:

1. Create the best model for both companies, and then change both businesses to be the same. While the outcome of this approach forms a uniform infrastructure across the enterprise, implementation would require dramatic changes in processes and culture, resulting in long adaptation curves and measurable losses in production. Going forward there would always be challenges in maintaining one-to-one data relationships in every aspect of business.
2. Agree to be different, and find a way to cooperate with minimal disturbance to the existing culture of design and production cycles in each company. Adopt best practices to support essential basic common processes, and implement automated and on demand systems for exchanging data between the companies.

While it is a viable option that other companies could reasonably adopt, we considered the business risk associated with the first option was too great. In favoring the second approach, our decision was made much easier by the identification of the OpenPDM Internet gateway software created by ProStep.

OpenPDM facilitates Internet based communication of metadata between independent database platforms (e.g. Oracle and SQL); it can also be configured to synchronize database managed electronic files. Today OpenPDM assists Langen Americas and Langen Europe with sharing designated PDM-managed data, as well as engineering designs and CAD libraries.

After agreeing on what should become common to make both businesses work as one, a number of automated triggers were built into the Enovia-SmarTeam PDM systems used by both companies. With the OpenPDM system sitting as the bridge linking the Enovia-SmarTeam databases, finalized documents and designated target data updates flow between the locations, ensuring the data remains synchronized.

For example: when a new bearing is added to the (common) CAD library in Canada, the file is immediately available to design teams in both companies, or when a machine design is finalized and released in Holland, just minutes later Canadian operations can create related BOMs and start the manufacturing process.

With the rapid evolution of remote access software, the six-hour time difference now actually presents opportunities. Costly design hardware can be used more effectively (using remote CAD workstations in the other location during off hours) and database maintenance tasks can be performed remotely after hours with all users logged off.

The evolution of Cloud computing will bring the next challenge to collaborative engineering. The evolution of Cloud-based systems to the point of effectively hosting CAD, MS Office, and other software applications, will require a reassessment of the model of separate IT infrastructures and gateway programs. Our next opportunity is fast approaching.

Mirek Tokarz is Director, Technology Development at Langen Packaging Group.
mirek.tokarz@langeninc.com

By Design

Harting Technology group establishes Canadian subsidiary

The **Harting Technology Group** in North America has established **Harting Canada, Inc.** (www.harting.ca) in Saint Laurent, QC. By establishing this direct presence in the Canadian market, Harting says that it recognizes the importance of its Canadian customers and assumes a larger role in helping them maximize their competitiveness.

Philip Harting (left), senior VP, Connectivity & Networks, Harting Technology Group; Margit Harting, senior VP and partner, Harting Technology Group; Claude Gravel, Canadian sales manager, Harting Canada Inc.; Dietmar Harting, president and partner, Harting Technology Group; and, Rolf Meyer, president and CEO, Harting, Inc. of North America.

The announcement coincides with the 25th anniversary of Harting in the U.S. As a pioneer in the industrial connectivity markets, the Germany-based, privately-owned Harting has historically focused on building strong relationships with its customers and while developing its connection technologies.

"Now that we have boots on the ground (in Canada)," said Rolf Meyer, president and CEO of Harting, Inc. of North America, "we want to persuade the Canadian market to see Harting in a different light – not only as a leading innovator and brand, but also as a local partner that delivers the best value proposition: quality, price, reliability and longevity."

Harting has also announced the appointment of industry veteran Claude Gravel as Canadian sales manager.

Inventors recognized by James Dyson Award

A Canadian-invented prosthetic arm controlled by brain signals has been recognized in the top 4 by the **James Dyson Award** (www.jamesdysonaward.org). The AMO Arm and its two Ryerson Biomedical Engineering student inventors, Michal Prywata (left) and Thiago Caires, are finalists in the international engineering award competition. They have launched Toronto-based **Bionik Laboratories Inc.** (www.bioniklabs.com) and are currently securing its first round of investor funding to refine the device for amputees.

Conrad Rieckhof, product manager, Intelligent Products, explains the pneumatic circuit monitoring and intelligent valves options available from Festo inside its Mobile Mechatronics Lab.

Festo seminar and lab highlight automation innovations

Festo held a seminar series in Mississauga, ON, and Montreal this fall to provide details on the company's latest developments and automation strategies.

The Automation Technology Expo and Conference – called "A symphony of savings driving profitability" – was designed to demonstrate how Festo (www.festo.ca) solutions are accelerating business processes, reducing costs and turning customer value into bottom-line results. The seminar topics included: Strengthen business performance through ratio analysis; and, Turn customer value into bottom-line results.

In addition to the three seminar topics that were presented throughout the day at each conference, participants had the opportunity to tour Festo's Mobile Mechatronics Lab – an interactive exhibit aboard a 53-ft trailer, showcasing innovations in industrial automation technologies, trends and product advances to support customer success.

"The Mobile Mechatronics Lab shows an overview of the product range of Festo Canada [and] Festo Worldwide. It gives our customers a nice opportunity to see where their application may fit it. It's not only showing the products, but it's also showing real-life applications for our customers, and it helps them to find the best solution for their problems and challenges," said Andreas Sobotta, Festo vice-president of product, market and distribution management.

News in Brief

Green aviation funding

GARDN (www.gardn.org), the Green Aviation R&D Network, has received an additional financing of $668,000 from the Federal Government of Canada in addition to its original amount of $11.8 million. GARDN can proceed with four new R&D projects aimed at developing more ecological aircraft, to expand in research horizons, and to attract new partners in the network.

ERP/MRP software

ERP/MRP system provider for small and mid-size manufacturers, **ISAH Business Software** (www.isah.com), has launched in Canada and appointed its first business partner in Canada, **GWA Business Solutions Inc.** (www.gwabiz.com).

R&D centre for ac drives

Finland-based **Vacon** (www.vacon.com) has announced the establishment of an R&D centre and lab for high-power ac drives in the Raleigh-Durham area, North Carolina.

CFPA drops gloves for charity

Celebrated '70s hockey pugilist Dave "The Hammer" Schultz (pictured right with Paul Pearson, VP of Regional Hose & Hydraulics) was on hand to help with the CFPA Annual Golf Tournament and Dinner fundraiser this fall. The **Canadian Fluid Power Association** (www.cfpa.ca) contributes to a yearly middle school Fluid Power Challenge, encouraging students to consider technological careers.

Hercules appoints Francois Germain as GM

Hercules SLR (www.herculesslr.com) has announced that Francois Germain (right) has been appointed as general manager, Quebec. Germain brings decades of corporate experience in the Canada's industrial and distribution sector to Hercules. Hercules is a manufacturer and distributor in securing, lifting and rigging equipment and devices.

Francois Germain

Calendar

February 12-15, 2012. San Diego, CA. **SolidWorks World 2012**, an international user conference and exhibition for 3D modeling, design, drafting and simulation (www.solidworks.com/sww).

May 14-16, 2012. Montreal. **Montreal Manufacturing Technology Show** presented by the Society of Manufacturing Engineers features a factory automation and machine tools exhibition and conference (www.sme.org/mmts).

June 7-9, 2012. Victoria, BC. **The 2012 Power Transmission Distributors Association Canadian Conference** for distributors and manufacturers serving the power transmission/motion control markets (www.ptda.org/canadianconference).

Wajax president and CEO Neil Manning.

Industrial distributor Wajax rebrands divisions

MISSISSAUGA, ON – **Wajax Corp.** – a distributor and service provider for equipment, industrial components and power systems – has unveiled new brands for its three key divisions to strengthening the company's national identity.

"The Wajax (www.wajax.com) name has stood for superior products, excellent service and competitive pricing for over a century and a half," president and CEO Neil Manning said. "With personnel and branches in every province, the Wajax name is synonymous with quality." Manning revealed the logos for the newly named Wajax Power Systems, Wajax Industrial Components, and Wajax Equipment.

Feature: Sensors

Optical motion sensors: the touchless alternative

By Christian Fell

Imagine motion sensors that can provide accurate measurement of the displacement and velocity of a moving surface, all without any physical contact with that surface.

That is the idea behind the optical motion sensors from INTACTON, a business unit of the Cologne-based FRABA Group. Based around specialized digital camera technology, these sensors are designed to be mounted a fixed distance from the surface that they monitor. By measuring changes to the optical image that they 'see,' these devices are able to determine exactly how much and in what direction the surface in their field of view is moving.

OPTIPACT and COVIDIS optical motion sensors

INTACTON optical motion sensors are a drop-in alternative to code wheels in manufacturing facilities producing roll products such as paper, fabrics, foil, plastic film or wire. Thanks to their no-touch feature, there are no problems measuring the movement of hot, wet, delicate, sticky or even gooey surfaces, and no chance of surface contamination. Moreover, because they monitor the surface directly, there is no loss of accuracy due to slippage, such as can occur with roller or wheel-based measurement systems.

These devices have also proven themselves to be useful in applications such as control of automated guided vehicles (AGVs). Here, a key advantage of INTACTON optical sensors is that they can deal with a wide variety of floor surfaces, even recognizing special navigational symbols painted on the floor. In this application, optical motion sensors can be significantly more reliable than wheel-mounted rotary encoders since they aren't affected by wheel slippage.

INTACTON produces two main types of optical motion sensors. The OPTIPACT product line uses an image correlation technique to measure displacements of the observed surface. Each device contains a light source and an optical image sensor. As the object moves, an image of the object moves across the face of the optical sensor. 'Snapshots' of these images are recorded at regular short intervals (Δt).

The shift in the image position is determined by an image correlation algorithm. Knowing the shift in the image position and the properties of the optical system (focal length of the lens and distance between the sensor and the monitored surface) it is straightforward to calculate the displacement of the target object (Δx and Δy) and the object's velocity ($\Delta x/\Delta t$ and $\Delta y/\Delta t$).

Most OPTIPACT sensors are equipped with a red LED light source that has the advantage of requiring no special eye protection for staff working near the devices. However, models with a laser light source are available for use with materials such as foil or plastic films that have extremely smooth surfaces.

These devices are compact and relatively inexpensive. They measure motion in two dimensions, which makes them a great choice for many manufacturing processes and for special applications such as AGVs. Accuracy is typically better than 1% of measured displacement while velocities as high as 4 m/s can be reliably monitored.

COVIDIS sensors, which are larger, make use of a sophisticated spatial frequency filtering technology that yields outstanding accuracy – typically within 0.05% of measured results. These devices also have extremely good dynamic response that means that they can detect standstill, changes of direction and accurately track accelerations or decelerations of the object being monitored. They have proven to be extremely useful in production facilities where accurate length measurements contribute to reduce material wastage.

Both OPTIPACT and COVIDIS motion sensors are designed to stand up to the challenge of industrial environments. In both cases, the housings are protected from dust and moisture to IP65 level, although of course the optical paths need to be kept reasonably dust and moisture-free to enable accurate measurements.

Both types of instruments feature RS232 interfaces for connections to control systems along with the standard quadrature pulse interface.

Christian Fell is with FRABA Inc. in Hamilton, NJ.
www.fraba.com

RFID safety sensors in machine guarding

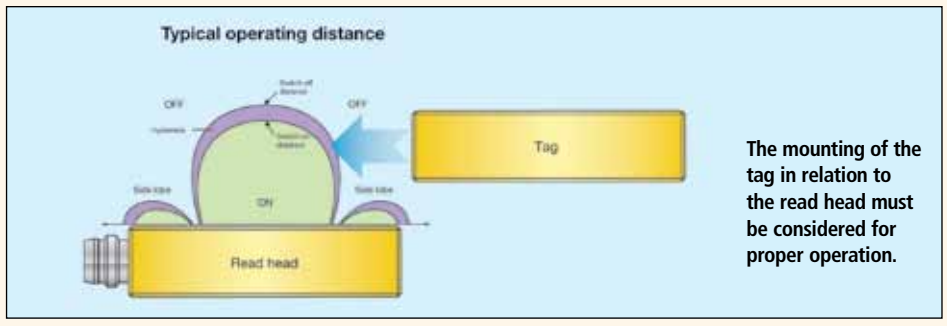
By Tim Cicerchi

Machine safety systems play an important role in factory automation. Machine guarding ensures that the machine is safe for operation. Doors and gates are protected with mechanical safety interlocks, which use a key or tongue to determine if they are open or closed.

Magnetic safety switches are used as well because of their sealed, low-cost design and their ability to be mounted in very wet and dirty environments. Although RFID has been available for 30 years, it hasn't been used in safety systems until recently. A trend in new machine designs now incorporates non-contact RFID safety systems rather than mechanical safety gate switches or magnetic sensors.

RFID safety sensors operate using different principles. This low frequency, 125 kHz system uses three standard RFID components for operation: the tag, which attaches to a movable gate or sliding fixture, the read head, which is mounted so that it will read the tag in the safe position, and the controller, which determines the safe integrity of the entire system.

Tags or transponders are battery free and contain a 32-bit, read-only identifier. Every delivered tag is guaranteed unique.



The mounting of the tag in relation to the read head must be considered for proper operation.

This ensures that when the system is initially setup, a teach procedure will link the tag information to a specific read head. Once that tag is read by a specific read head and the data is verified, the system can be made safe. No other tag/read head combination is allowed once taught.

The read head is a simple ring antenna that communicates with the tag. Read ranges up to 15 mm allow the tag to enter the read field from any direction. This differs from older magnetic safety systems where independent contacts can switch independently when targets move in from the side. Read heads can also be conveniently located up to 30 m from the controller without any degradation of signal strength.

The controller is the brain behind the RFID safety sensor technology. Users can choose to connect one read head or as many as four read heads to control the module. It internally multiplexes the read heads, which allows all read heads to be run in close proximity with one another without mutual interference. The controller also performs the safety evaluation. When the tag moves into position over the read head, the data is evaluated by two microprocessors. If the data is the same, the controller signals the safe state and the machine is ready to run.

The use of non-contact RFID safety sensors is increasing. The sensors reduce machine and wiring costs and are ideal for a wide range of industrial safety applications and RFID safety sensor systems have become a viable option for industrial machine guarding.

Tim Cicerchi is Product Manager, Pepperl+Fuchs (fa-info@us.pepperl-fuchs.com).
www.pepperl-fuchs.us

Feature: Enterprise CAD

No warning light needed for company to drive innovation

By Rich Allen

As the world's largest manufacturer of emergency warning products, ECCO (Electronic Controls Company) wasn't content just producing backup alarms and warning lights for commercial vehicles. Seeing innovation as an essential strategy for maintaining its leadership position, ECCO (www.eccolink.com) expanded into new markets such as closed-circuit television systems for industrial vehicles and warning lights for emergency services.

PDM allows for custom designs in a fraction of the time

To handle the expansion, the Idaho-based company decided to pursue product data management (PDM) technology to generate greater efficiencies and increase productivity. To achieve this ECCO needed to adapt PDM technology that would allow them to create custom designs in a fraction of the time, eliminate paper documents and integrate with critical business systems.

"To take the next step forward, we wanted to leverage PDM technology and SolidWorks software's open Application Programming Interface (API) to ramp up automation and integration," said ECCO engineering team leader Todd Mansfield.

An important part of ECCO's PDM evaluation was understanding the potential for customizing the application and integrating it in-house. ECCO software engineer Norm Nguyen had already tapped the SolidWorks API to create a robust, knowledge-based design automation application. The company sought a PDM system that would give Nguyen the flexibility to push PDM to its limits.

ECCO chose SolidWorks Enterprise PDM software, acquiring 25 licenses, because of its ease-of-use, full integration with SolidWorks design software and open API development tools. "Because we have a software engineer on staff, we have the ability to fully exploit the SolidWorks API," Mansfield noted. "SolidWorks Enterprise PDM gave us the greatest potential for adapting the solution to meet our needs. It gives us better control through workflow automation, improved search speed and reporting via our SQL database, and greater integration with our core business systems."

After working with local reseller GoEngineer to migrate data and completing custom development to integrate systems, ECCO implemented SolidWorks Enterprise PDM in late 2010. By formalizing its workflows and tying in its own design automation application, the warning products manufacturer was able to achieve substantial productivity improvements. Using SolidWorks Professional software, ECCO had already reduced its design cycles by 40%. Following the SolidWorks Enterprise PDM implementation, the company is realizing an additional 25 to 30% reduction in the time it takes to complete design reviews and approvals.

By implementing SolidWorks Enterprise PDM, ECCO has rapidly expanded its product portfolio and is realizing an additional 25 to 30% reduction in the time it takes to complete design reviews and approvals. The implementation has also eliminated paper from ECCO's development process.

"These time savings mean more to our business than you might think," Mansfield explains. "In addition to the internal benefits, these efficiency improvements allow us to better respond to our customers. By automating configurations instead of doing them manually, we have cut configuration time from four hours to 30 minutes, allowing us to respond quickly to specific requests and enhance customer satisfaction."

"One of our goals was to eliminate paper. The manual routing of paper design packets, which we had used for years, slowed us down," said Mansfield. "We believed that a PDM system would enable us to further reap the benefits of automation."

The SolidWorks Enterprise PDM implementation has eliminated paper from ECCO's development processes. Using PDF files as the driving review and approval file format – as well as formalized workflows and automated approval processes – the manufacturer is developing products from start to finish without using a single sheet of paper.

"Through the combination of Norm Nguyen's wizardry, [CAD Manager] Joe Torres' hard work, and SolidWorks Enterprise PDM, we've gone paperless," Mansfield said. "The impact is much more than the cost of paper and ink. Whenever you rely on paper, processes slow down. A routing packet might be sitting on someone's desk, get misplaced, or go missing. With an electronic, paperless system, the process is more reliable and efficient."

Connecting ECCO's PDM system to its existing business systems, as well as to sister companies in the ECCO Group, was an important requirement of the PDM implementation.

Nguyen used the SolidWorks API to integrate SolidWorks Enterprise PDM with ECCO's cloud-based Intuit QuickBase (http://quickbase.intuit.com/) project management software and Expandable MRP (www.expandable.com) system.

When ECCO opens a project, custom fields in the SolidWorks Enterprise PDM data card are populated from the cloud to assign project responsibilities. PDM design data then feeds into ECCO's MRP system.

Rich Allen is SolidWorks Product Manager, PDM Solutions.
www.solidworks.com

Cloud-based CAD tools offer collaboration alternative

By Tuomas Holma

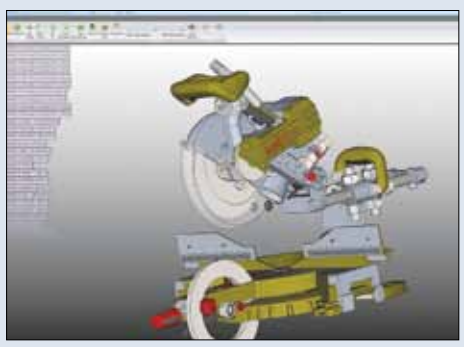
As any designer or design manager knows, working on a 3D CAD model can be extremely complex, with many parties contributing from a variety of platforms to a massively varying degree.

Large, complex files, disparate 3D software applications and lack of accessibility to workstations can cause difficulty in transferring data. Tracking multiple comments and changes becomes a formidable administrative challenge.

Addressing these real world difficulties is what CadFaster had in mind when it first started developing its CadFaster|Collaborate 3D CAD Cloud Computing plug-in tool enabling design team collaboration (annotations and co-viewing) from multiple locations.

CadFaster|Collaborate works as a plug-in to full-fledged CAD software platforms such SolidWorks. Once the plug-in is installed, you may use the CadFaster|Collaborate tab in these CAD platforms to convert a 3D assembly model into an executable file – a lightweight file with a powerful 3D viewer.

CadFaster|Collaborate compresses the original data so that huge files can be shrunk to a size that can be emailed or downloaded from a link. These EXE files are small enough to run on low-powered laptops. You do not need a desktop client to view the exported file; a simple double-click will launch the executable file, along with its own interface for viewing and annotation.



CadFaster|Collaborate 3D CAD Cloud Computing plug-in tool – compatible with SolidWorks – enables design team collaboration (annotations and co-viewing) from multiple locations.

You may also use the application to upload the lightweight model to a cloud server, accessible from the recently introduced CadFaster iPad application. Initially, you get 100 MB of storage space and can buy additional storage at a nominal fee. Users enjoy both the freedom of accessibility and the security of knowing that the stored models cannot be modified in the executable file format.

Once you've launched the executable file, you can view your model in cross-sections, study its internal components, add comments to it, or take measurements on it. You may also initiate a co-viewing session, which allows you and your collaborator to go online and look at the same model together in real time.

With this method, you can easily invite someone to review and comment on a design from an iPad, in a collaboration session that facilitates both the desktop user and the tablet user. In a co-viewing session, the host takes control of the operations (so the host can, for example, set the transparency of a part to reveal its internal structure), but the guest sees the same view the host sees. At any given moment, the host may pass control over to the guest.

CadFaster synchronizes comments between desktop and the iPad mobile apps, so if you add a comment on a shared document from your desktop, your collaborator who launches the same file on his or her iPad receives an alert, along with your comment.

Tuomas Holma is VP of Sales and Marketing at CadFaster.
www.cadfaster.com

POWER to CHOOSE

Cutting-edge power supply technology for every class

QUINT POWER
Superior system availability

TRIO POWER
High quality basic power

STEP POWER
Low power for industrial and building automation

MINI POWER
Measurement, control and regulation applications

- **High-performance reliability**
- **Built-in function monitoring**
- **Power Boost technology**
- **Uninterruptible Power Supply options**
- **Worldwide use** - wide input voltage range and international standards/approvals

For additional information:

Toll Free: **(800) 890-2820**
Email: **cdinfo@phoenixcontact.ca**
or visit:
www.phoenixcontact.ca

Tested to -40°C Coldstart*

*QUINT and STEP POWER

c UL us LISTED
Class 1, Zone 2*

PHOENIX CONTACT
INSPIRING INNOVATIONS

Feature: Enterprise CAD

Hockey stick robot scores with MapleSim assist

Hockey Robotics is a company that has pioneered the concept of robotic testing for the hockey industry. It specializes in hockey stick design, performance, and durability testing using an advanced hockey stick testing robot.

Hockey sticks most often break during a slap shot; therefore the company's goal was to produce a robot capable of properly mimicking the professional hockey slap shot. The Hockey Robotics team, with support from industry partnerships, manufactured the SlapShot XT, a dynamic hockey stick robot capable of delivering a slap shot at speeds up to 110 mph.

The SlapShot XT is the first ever robot capable of executing a slap shot like a professional hockey player. The robot's integrated advanced electronics and software allows the gathering of data never seen before, enabling even more detailed analysis of the results to support further refinements in hockey stick design.

In hockey sticks, breaking may occur when the stick is subject to very large three-point bending loads during a slap shot. The first step in creating the robot was to fully understand the motion of the hockey stick during a slapshot using advanced motion tracking techniques, and then create a virtual model of the robot to reproduce that motion.

During slap shots by highly proficient hockey players, the trajectory of the stick was tracked at important locations using high-speed cameras. By analyzing this data, the SlapShot XT robot was designed and developed to accurately re-create the loading to which a stick is subjected during a slapshot. The SlapShot XT is capable of shooting a puck at over 100 mph with either a left- or right-handed stick.

MapleSim, a physical modeling and simulation tool from Maplesoft built on a foundation of symbolic computation technology, played a critical role in the design and development of the SlapShot XT. It efficiently handles all of the complex mathematics involved in the development of engineering models, including multi-domain systems, plant modeling and control design.

"MapleSim allows us to perform engineering analysis that was previously too challenging and computationally intensive for our industry to undertake," said Dr. John McPhee, chief scientist, Hockey Robotics.

MapleSim allowed Hockey Robotics to efficiently and accurately simulate the coupled dynamic electrical and mechanical behavior of the equipment. The software enabled the concurrent study of the flexible body deformation and rigid body motion of the machines, which is a very difficult, time-consuming, and error-prone task when done by hand.

MapleSim allowed Hockey Robotics to efficiently and accurately simulate the coupled dynamic electrical and mechanical behavior of the SlapShot XT robot.

A four-bar mechanism was synthesized to match the hockey player's motion, and subsequent dynamic and stress analyses were used to develop and confirm the performance of the resulting robot design.

A flywheel maintained the stick's momentum during contact with the ice, and the robotic hands allowed the stick to bend about two axes, storing and releasing strain energy throughout the shot. The final design was evaluated using NX 6 from Siemens PLM Software and finite element models of the components.

The result was definitive: The robot provides repeatable, unbiased test data on the performance and durability of hockey sticks, a first in the industry.

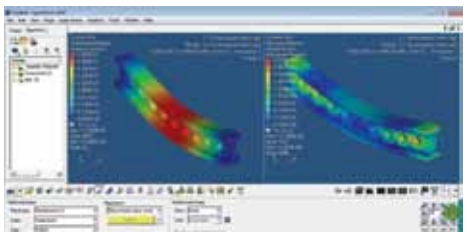
This article was contributed by Maplesoft.
www.maplesim.com

CAD Chronicle

Clippard launches Phase II of 3D product catalog

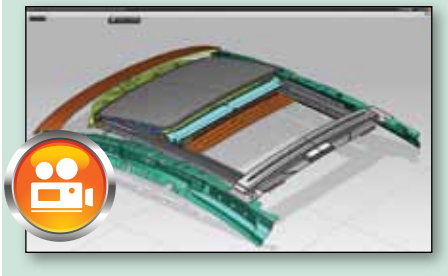
Clippard Instrument Laboratory has announced its expanded 3D catalog powered by TraceParts. The new phase includes its broad electronic and control valve miniature pneumatic lines. Clippard Minimatics products are used for control, interface, sensing, logic and actuation functions. The wide range of applications includes machinery, packaging, medical equipment, processing, textiles, animation, agriculture, material handling and assembly.
www.clippard.com • www.tracepartsonline.net

CAE for students



Altair Engineering has announced the release of the HyperWorks 11.0 Student Edition, a personal academic version of the its suite of computer-aided engineering (CAE) software used by manufacturers around the world. The Student Edition offers affordable opportunities for engineering and design students to gain experience in computer simulation with the same software that engineering professionals use to design and develop everything from aircraft and automobiles to computer chips and golf clubs. The software includes access to core HyperWorks commercial technologies that support the complete CAE workflow process for various solution types and applications.
www.altairhyperworks.com/student

NX 8 enhancements include CAE

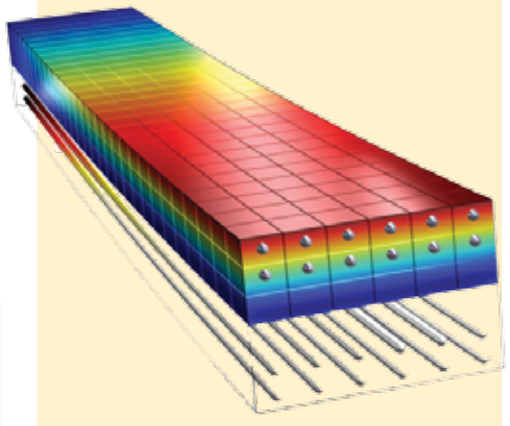


Siemens PLM Software has announced the latest release of NX software, the company's integrated computer-aided design, manufacturing and engineering analysis (CAD/CAM/CAE) application. NX 8 includes enhancements to its CAE offering – including its NX Nastran software for solving challenging simulation problems. NX CAE is said to work with virtually all leading FEA solvers as well as NX Nastran.
www.siemens.com/plm/nx8

SolidWorks Education Edition

Dassault Systèmes SolidWorks Corp. has released its newest software for the education sector, SolidWorks Education Edition 2011-2012. Based on SolidWorks Premium 2011 software, the product combines tools for simulation, sustainable design and motion, enabling both students and educators to create a classroom experience. DS SolidWorks couples classroom teaching with hands-on design exercises, testing and certification, ensuring that students have their pick of future opportunities. Students are granted free access to the Certified SolidWorks Associate (CSWA) exams.
www.solidworks.com

Soil and rock mechanics simulation



COMSOL, Inc. has introduced the Geomechanics Module for geotechnical and civil-engineering applications such as slope stability evaluation and failure prediction of tunnels, retaining structures and excavations. The module provides tailored interfaces for studying plasticity, deformation, and failure of soils and rocks, as well as their interaction with concrete and human-made structures. The module, which comes with a variety of material models for soils, builds off of the Structural Mechanics Module add-on for the company's flagship simulation software, COMSOL Multiphysics, and offers the ability to combine analyses with all other COMSOL modules.
www.comsol.com

CAD Industry Watch

SolidWorks 2012 has all the right moves

By Bill Fane

Your company can't survive if you just produce solutions that work, but now you also need to do detailed analyses to ensure that you are producing the optimum design.

Motion optimization key feature of new release

It is interesting to see how "CAD" software has evolved a long way from the basic 2D drafting programs of 30 years ago. Each new release of a 3D design package offers a number of detail improvements to help us with the basic design functionality, but more and more the headline-grabbers in the new release involve analysis and evaluation of our designs rather than just simple documentation of them. SolidWorks 2012 from Dassault Systèmes is a case in point.

When was the last time you created an assembly that involved relative motions between the components? Fairly recently, I would guess. Sometimes the design of such an assembly can be fairly straightforward, but sometimes it can get a little messy. In the latter category, four-bar linkages leap quickly to mind. SolidWorks Premium has included motion analysis tools for a while now, but SolidWorks 2012 adds interesting new Motion Optimizer functionality.

With SolidWorks 2012, however, the solution for reconstructing a sail boat steering mechanism is relatively trivial (right). All I need to do is to specify the up and down positions for the rudders and the tillers and to indicate which dimensions can be varied, and whether the variations are incremental or specific values. SolidWorks 2012 then rapidly munches through every possible iteration of the variables and picks the optimum solution.

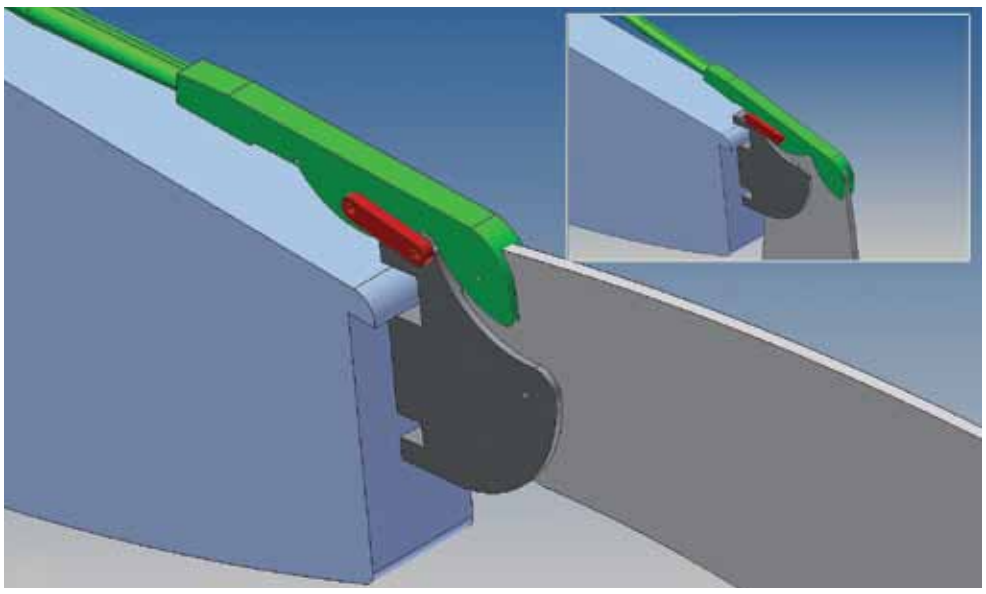
The Motion Optimizer can also handle things like spring constants, air and pneumatic cylinders, and gravity.

The price is right…

Engineering software can analyze such factors as stress, flow, mold design and environmental impact, and you can "instantly" see the results of changes to the model. So far so good, but a "perfect" design can still fail to make it in the real world if it costs too much to manufacture.

SolidWorks 2012's Costing functionality adds a significant new analysis tool to help designers in this regard. You can analyze machined or sheet-metal parts to estimate their manufacturing cost. You can experiment with different materials, different part configurations, and different processes (for example, laser cutting versus water jet).

Over the years, computer hardware has become faster and more powerful at an exponential rate. The people who do run into problems, however, are those of us who are designing ever bigger and more complex assembly models. Large-model performance has not increased as quickly as hardware performance.



In my Hobie Cat 16 sailboat, twin rudders are pivoted so they can swing up for beaching. I created the new link (shown in red) to replace a worn one, and then played with its length and the location of the pivot holes until I got what I wanted. SolidWorks Motion Optimizer quickly took care of many design iterations and chose the best.

Each engineering software vendor has come up with one or more solutions. This time around, SolidWorks 2012 offers their Large Design Review functionality.

Large Design Review very quickly opens an assembly in what is effectively a read-only mode. Among its capabilities is the ability to navigate the Feature Manager design tree, hide and show components, measure distances, create and cap cross sections, and create, edit, and play back walk-throughs.

By the way, this will be the last release of SolidWorks that will run under Windows XP.

Bill Fane (bill_fane@bcit.ca) is a software reviewer and retired mechanical engineering instructor at BCIT in Burnaby, BC.

Software's role in sustainability and augmented reality

By Randy Frank

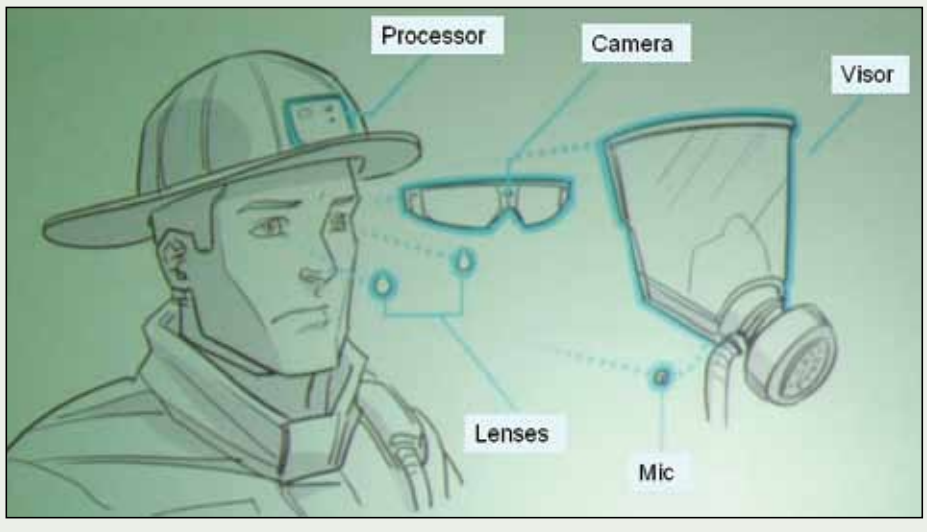
Sustainability and augmented reality were two featured sessions that set the stage for the Congress on the Future of Engineering Software (COFES) 2011 conference held earlier this year in Scottsdale, AZ. In both instances, the intimate relationship between software and hardware was readily apparent.

Sustainability is an issue gaining momentum in many design circles and software has a prominent role, even though in and of itself, software appears entirely sustainable. The Design and Sustainability (DaS) Symposium that preceded COFES 2011 brought out several aspects in different markets for software designers to consider.

With an average life in the U.S. of about 18 months, cell phones provide the poster child for products that do not age gracefully. "The more electronics you build into objects, the less they seem to last," noted Prasad Boradkar, director of InnovationSpace and associate professor of Industrial Design at Arizona State University.

Boradkar's work in biomimicry explores the materials, processes and functions of nature to provide innovative solutions that minimize the environmental impact of man-made products.

Building tools into CAD products that help designers and engineers consider the right materials is a great start and provides a fundamental tool but it's just the beginning according to Terry Swack, cofounder of Sustainable Minds, a company that provides eco-concept modeling and life cycle assessment software.



The hardware components of both a military and fire fighter head-mounted display (HMD) have some similarities but special contact lenses and advanced software provide even greater capabilities for the newer firefighter concept.

"We need to think larger in terms of collaboration and the whole life cycle and we need new processes to learn, assess, design, model, analyze, report and be able to access that data on a consistent basis," she said. As a result, companies will need to map and track an extensive amount of data as well as understand and communicate benchmarks and set goals for improvements.

One of the companies providing sustainability tools is Dassault Systèmes SolidWorks Corp. Asheen Phansey, product manager for Sustainability, commenting on observations of others said, "Wal-Mart not letting up – that's going to really drive sustainability to the forefront."

Phansey identified stages of maturity for sustainability that involve engineering software. The first stage is normal compliance. The second stage is company-level sustainability initiatives, such as green buildings, paperless office and major energy efficiency projects. At stage three, the company looks at its greatest impact, which usually is its products and services. Stage three can drive concepts like biomimicry and cradle–to-cradle closed-loop production. To truly make progress, beyond software dashboards that show the impact of a design or interfaces that detail the life cycle, intelligence must be created from designers' models.

In the area of augmented reality, Joseph Juhnke, president and CEO of Tanagram Partners showed some exciting examples of how the latest hardware coupled with innovative software can provide incredible capabilities.

Juhnke's company was awarded a DARPA research grant to design a system to improve the situational awareness of soldiers deployed in dangerous situations. The solution was a server/client-based architecture that responds to the program needs by providing digital augmentation of the surrounding environment.

The iARM (Intelligent Augmented Reality Model) platform has an open source operating system that supports geolocation and triangulation as well as data services that integrate voice, video and image for facial/object recognition and pattern analysis. The hardware platform consists of a computer processor, encrypted wireless, camera/video and a visual display.

Application of similar technology for fire fighters is enhanced by Innovega optics technology. The company's iOptik contact lenses allow the direct viewing of full color digital images from tiny micro-displays without any impact on the user's normal vision. Juhnke calls it the magic behind the magic.

In addition to the viewing, a series of very small metal pieces embedded in the lenses perform similar to radio frequency identification (RFID) chips and provide passive eye tracking. "When you move your eyes, we know it because our sensors see the RFID chips move," says Juhnke. The combination allows two focal planes to be seen and converge to create head-mounted augmented reality.

Products: Power Transmission

Self-adjusting cushioning cylinder

Festo has expanded its DSNU round cylinder series with the self-adjusting, pneumatic PPS cushioning system. The system allows a gentle approach to the end position without intervention at the cylinder and adapts to changing loads. This is achieved by a special cushioning system that eliminates the need for adjusting screws and saves time at initial installation for setup. The elimination of cushion screws results in a clean design suitable for food processing type applications or where trapped debris can contaminate an existing process.
www.festo.com/cms/en-ca_ca/14041.htm

Stainless shock absorbers

ACE Controls has introduced V4A model stainless steel industrial shock absorbers. The models are self-compensating in design with metric treaded outer bodies. Thread sizes range from M14 x 1.5 up to M64 x 2. Energy capacities range from 175 to 30,000 in. lb/cycle. Adaptable to a wide range of applications, effective weight capability ranges from 2 to 93,600 lb.
www.acecontrols.com

48 V electric supercharger

Developed for a new generation of micro mild hybrid vehicles, Controlled Power Technologies has introduced an application of switched reluctance motor technology for existing 12 and 24 V systems to exploit the proposed 48 V electrical architecture fast gaining ground in Europe. Other applications of a more powerful air charging solution for reducing CO2 emissions without sacrificing vehicle performance include commercial vehicles for reducing diesel engine NOx and particulate emissions.
www.cpowert.com

Electro-hydraulic proportional valves

Eaton Corp. has announced AxisPro proportional valves designed to support both centralized and distributed axis control architectures in high-performance applications in woodworking, wind turbines, pulp and paper production, metal forming, plastic injection and blow molding,

primary metals, and other industries. The valves contain programmable onboard electronics and integral spool LVDT sensors. The initial products are offered in ISO-3 and ISO-5 sizes with rated flows of 40 lpm and 100 lpm, Dynamic bandwidth for the ISO-3 valves is 150 Hz and 100 Hz for the larger ISO-5 models. Both have 350 bar rated P, A and B ports and 250 bar rated T-port.
www.eaton.com/hydraulics

Fan drive motors

M5 series fan motors from Parker Hannifin are rated for continuous, reliable and efficient performance at up to 4060 psi in heavy-duty mobile and off-highway applications as well as portable power units. M5AS and M5ASF fan drive motors are engineered for high starting torque to withstand the higher pressures and speeds experienced in today's largest mobile machines. Independent-speed control capability enables the speed of cooling fans to be matched precisely to the operating load of the vehicle, facilitating greater overall system efficiency and minimized wear on parts. Units are rated for continuous operation at speeds between 3000 and 5000 rpm.
www.phpump.com

70 bar hydraulic clamping

Enerpac has announced a 70 bar line of products for low-pressure workholding applications. Products including link clamps, swing clamps and remote mount system valves. Enerpac 70 bar link clamps are offered in a wide range of models, including 2, 3.5, 5, 7 and 9 kN capacities, with right hand, centre and left hand configurations. The swing clamps are offered in 2, 3.5, 5, 7, 9 and 20 kN models in left and right turning configurations. Both single- and double-acting link and swing clamp models are designed with BSPP and manifold porting.
www.enerpac.com

Pumps and compressors

The Thomas line of single and double piston pumps and compressors, comprised of the 660/668 and 2660/2668 Series, feature air flows to 5.25 cfm, pressures to 160 psi and maximum vacuum to 99% of local barometer (990 mbar). Features include die-cast aluminum parts, low vibration and reduced sound level.
www.gd-thomas.com

Compressed air FRLs

The AS series from Bosch Rexroth is now available in a smaller version. The system, which provides compressed air quality in a wide variety of applications and work environments, now includes the AS1 series for use in the low flow range. With a width of 43 mm and connection thread G1/4, the AS1 series is for applications with flow requirements up to 1000 std l/min. These maintenance units not only perform the standard functions of filtering, regulation and lubrication (FRL), their modular and compact design further allows for the integration of all specific functions. Precision controllers, distributors, 3/2-way shut-off valves and filling valves round out the product range of maintenance units.
www.boschrexroth.ca

LVDTs certified for GE gas turbines

Macro Sensors is now an approved LVDT supplier for General Electric (GE) gas turbines. The LVDTs are implemented for position measurement on governor valves, throttle valves, reheat/stop valves, interceptor valves, and many other control valves. While Macro Sensors has been certified for use on GE steam turbines for years, the company expanded its sensor certifications to include ATEX and CSA approval to be included on GE gas turbines.
www.macrosensors.com

Hydraulic oil reservoir tank

The IFH Group hydraulic oil reservoirs and fuel tanks for off-road and specialty vehicles are customized to meet customer designs and applications, and available in capacities from 1 to more than 300 gallons. The reservoirs and tanks, as well as custom fluid containers and tanks of all types, come in a range of materials including mild steel, stainless steel, aluminum and aluminized steel.
www.ifhgroup.com

Synthetic food grade compressor oils

Ultrachem has developed a line of Omnilube food-grade rotary screw and reciprocating air compressor lubricants said to have greatly improved wear, oxidation and lubricity vs. currently available H-1 food grade synthetic lubricants. Field tests have shown these lubricants – Omnilube 32/46, 68, and 455 – to outlast other synthetic H-1 lubricants by 50% to 100%. Omnilube food grade products meet all of the requirements of the USDA and FDA H-1 regulations, 21 CFR 178.3570, and conform to the requirements of NSF. They are also approved by the Orthodox Union for Kosher use.
www.ultracheminc.com

IP67 pressure sensor line

Balluff has introduced BPS, a series of pressure sensors with IP67 protection for use in gaseous and liquid media. The devices feature a long-term stable ceramic load cell and a display that shows not only the current system pressure in bar, mbar, PSI and MPa, but also features fast and simple configuration of the sensors according to the VDMA standard, using 2 keys and intuitive menu guidance. With 11 pressure range versions the BPS sensors cover ranges from -1...0 bar up to 0...600 bar.
www.balluff.com

Feature: Power Transmission

Fourslide part making technique reduces power press expense

The fourslide part-making process offers several benefits versus the traditional power press. Here's how to decide if and when to take advantage of it.

Named for the four tool slides that perform stamping and forming operations, the fourslide process offers several benefits over the traditional power press when it comes to making parts. Among its advantages: the cost-effective manufacturing of complicated forms, reduced production expenses, speedier product delivery and wide latitude to modify forms without a steep monetary penalty.

Yet, just as you would never show up to a gunfight with a knife, neither can a process like fourslide excel within power press's proven milieu. The following considerations can help any engineer determine when to exercise this additional manufacturing option.

When seeking to keep project costs in containment, obtaining parts from a source that employs the fourslide process makes sense. The means by which so much money can be saved is best illustrated from a cursory understanding of the process itself.

Fourslide manufacturing begins with the raw material in flat strip form off a coil, which is stamped or blanked in the progressive die section of the fourslide machine. The strip is then fed into the forming section, where four tool-carrying slides approach the part from the four cardinal compass points, forming the material around a central tool or mandrel. The set-up of the machine cams determines the sequence, timing and number of tool strikes.

Because the four forming tools are simply tool blocks carried by the slides, and forming is accomplished by the ability of the tools to approach from a variety of directions, these tools can be machined for a fraction of the cost of complicated power press dies that must include actuators within the tool itself to perform these forming functions. As a result, tooling for power presses can cost tens of thousands of dollars, while fourslide tooling typically runs just a fraction of that, making the fourslide tool more easily justified.

Because of its unique integration of compound forming operations, the fourslide process can execute multiple bends, bends beyond 90°, twists, cylindrical forms, and tapped holes before the part is ultimately ejected. This capability yields precision metal stampings, flat springs, wire forms, contacts and other complex forms for a wide range of medical, electrical, automotive, aerospace, military, consumer and industrial applications.

The simplicity in machining fourslide tools, versus the time-consuming complexity of power press tools, translates into a significant reduction of lead times approaching 50% or more.

By the same token, the straightforward motion of fourslide tools simplifies laborious after-production adjustment often encountered with power press tools, further speeding the initial delivery of product. A false economy especially applies to manufacturers who seek shortcuts by going to offshore vendors for power press tools.

If a product is readily subject to the changes of today's commercial market, changes in technology, or even the arbitrary demands of a specific customer, then the fourslide process definitely represents the best route for part manufacturing.

The same rule applies when "first-article" runs don't come out as expected, and a part revision becomes necessary.

In contrast, the modification of a power press tool can turn into an extremely expensive process. In the case of a die, a whole new one may have to be built. But in a fourslide operation, part modification costs less because the tooling costs less.

Capable of production rates of 15,000 pieces per hour – depending on part size and complexity – the fourslide process has been successfully employed to produce part runs numbering the tens of millions.

ThermOweld, a manufacturer of exothermic welding devices and materials used for welding heavy-duty grounding cables, went to Fourslide to manufacture the contacts used in its patent-pending EZ Lite Remote electric ignition system.

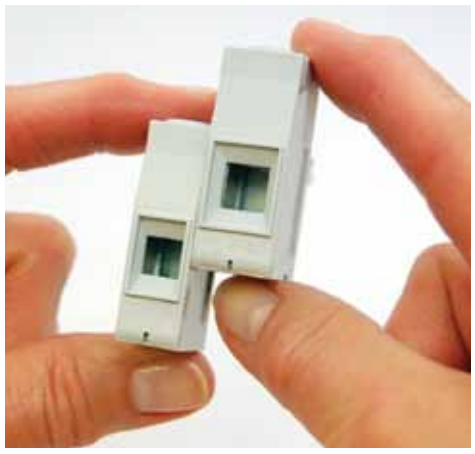
This article was contributed by Fourslide Spring and Stamping Inc.
www.fourslide.com

Products: Connectors

Panel-mount receptacles

Binder-USA has expanded its series 620 snap-in panel-mount receptacles to now offer dip solder contacts. The snap-in connectors are suitable for commercial and medical applications because of their quick disconnect feature. The snap-in receptacles are designed with a durable all plastic shell with an outer diameter of 11.5 mm. The connectors are IP67 rated when properly installed and mated ensuring the connection is protected from liquids and debris.
www.binder-usa.com

Panel feed-through terminal blocks

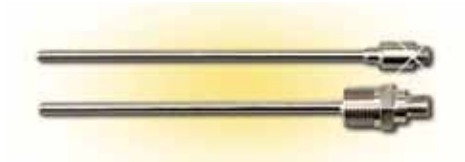


BlockMaster Electronics has introduced a line of panel feed-through terminal blocks. The blocks allow the designer to completely isolate the electrical elements of his product from the EMI/RFI or other outside electronic interferences. The BlockMaster MPT Panel Feed-Through series is useful for design opportunities in medical imaging, motor and robotic motor control generator sets and other high power switching outputs that will meet domestic and international EMI/RFI requirements, the company says.
www.blockmaster.com

Sensor actuator line

CONEC SAL series sensor actuator circular connectors are available in a variety of overmolded sizes and styles, including M12, M8 and 7/8 in. The connectors are sealed to IP67 and IP69K requirements, with specific configurations designed especially for the industrial automation and food/beverage industries, and can operate at extreme temperatures up to 125°C.
www.conec.com

Thermocouple probes



M12 series thermocouple sensors from Omega include a variety of metric and NPT mounting thread options, as well as convenient M12 connectors. The M12 connectors include thermocouple compensated pins in Type J and Type K calibrations. The sensors are available with Type J, 316 stainless steel, or Type K, Inconel 600 sheaths, ungrounded junctions, and a variety of metric and imperial diameters and lengths. The M12 connectors have a temperature range of -50° to 90°C, and are rated to IP67.
www.omega.ca

Circular hybrid technology connectors

Molex Inc. has introduced the Brad Micro-Change M12 Circular Hybrid Technology (CHT) connector that combines Cat 5e data speed and power supply. Combining both the power and data lines in one M12 connector, the Micro-Change CHT connector is said to feature a reduced footprint and lower installation and cabling costs in process and automation control and industrial applications, HVAC systems, telecoms infrastructure, vision systems and surveillance cameras, commercial transportation, and military/aerospace applications.
www.molex.com

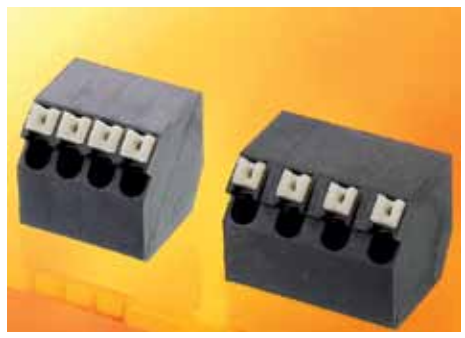
Connectors for underwater applications

ITT Interconnect Solutions has developed a series of interconnect products developed for underwater environments, including marine and naval applications. The waterproof CIR Marine Bronze series connectors meet IP67 specifications when mated, and are manufactured from an aluminum-bronze alloy that also contains iron, nickel, manganese and lead, making them resistant to rust and corrosion. The connectors are said to offer fast coupling/uncoupling with a "snap-in" lock, which provides audible verification of correct coupling.
www.ittcannon.com

LED lighting connectors

AVX Corp. has developed two new series of connectors for LED lighting systems that maintain the same luminosity and light intensity as florescent strip lights. The standard length of most fluorescent lights is 1.2 m, and currently it is impossible to reflow-mount LEDs on such a long printed circuit board placed in the fitting. As a result, the lighting strip is divided into shorter lengths joined by connectors.
www.avx.com

Compatible terminal blocks



Integrating Springcon technology in a reflow compatible housing, the AST23X series of terminal blocks from RIA Connect feature a compact forty-five degree design in 3.5 and 5.0 mm centerlines. Tool-less operation is achieved with the use of solid wire up to 16 AWG. UL and VDE approvals are pending. Free samples are available.
www.riaconnect.com

Composite shell circular connectors

The API Technologies Spectrum Control product line now includes the composite connector series. The composite connectors feature shells fabricated from high grade thermoplastic. Designed to displace traditional metal connector shells for substantial weight reduction, the new addition to the Spectrum Control product line offers composite shell versions of its circular connectors in MIL-38999 series III and IV, available EMI filtered or unfiltered, the company says.
www.specemc.com

Distributed modular I/O

Balluff distributed modular I/O can be used in a cost effective way to replace standard slice I/O and distributed I/O solutions, the company says. Offering IP67 protection and industry standard connectors, many types of control data can be collected. Using standard 3-conductor cables, up to 4 slave devices can be connected to each master block, which communicates over the industrial Ethernet network to the controller.
www.balluff.com/io-link

M23 circular connectors

Weidmuller has introduced a modular M23 connector line featuring circular connectors for signal, power and hybrid (signal and power) applications – designed for use outside the cabinet in machine and industrial automation applications. The M23 connector line includes signal connectors ranging from 6 to 19 poles, along with a 6-pole (5 +PE) power version, and a hybrid connector with 4 power contacts and 4 signal contacts.
www.weidmuller.ca

Passivated stainless steel

RF connectors

Crystek has released its line of radio frequency (RF) connectors to its distribution network. The company supports a full line of passivated stainless steel RF connectors – SMA, TNC, N-Type, 2.4 mm, 2.9 mm (K) – in jack, plug or bulkhead styles. Crystek currently offers connectors that are designed to be mated with cables from Semflex, IW and Harbour.
www.crystek.com

Products: Enclosures

Floor-mount type 4 models

Pentair Technical Products has announced the addition of four 18-in. deep models to its Hoffman two-door, floor-mount Type 4 enclosures, Bulletin Number A4L3. With the addition of the new models, the line includes solutions for an even wider range of applications. Featuring a UL Type 4 rating, the enclosures are suitable for use in indoor or outdoor environments where it is necessary to protect controls and instrumentation from wet, potentially corrosive environments.
www.hoffmanonline.com

Modular NEMA 12 series

Hammond Manufacturing has developed the Hammond Modular Enclosure (HME) series, a versatile housing for industrial control, operator interface equipment and switches and circuit breakers installed in industrial environments. Offering environmental protection to NEMA 12 (IP54), the HME range, constructed with a fully welded frame for strength and rigidity, comes in three base designs.
www.hammondmfg.com

Thermoelectric cooler

Pentair Technical Products has announced the McLean Thermoelectric Cooler for cooling electronic components in small indoor or outdoor electronic enclosures. Operating on Peltier effect technology, the thermoelectric coolers deliver 60, 100 or 200 W of cooling. The compact thermoelectric coolers are said to be low maintenance because they feature no refrigerant, compressors or filters.
www.mcleancoolingtech.com

Explosion-proof enclosure heater

Chromalox has introduced the Chromalox XPMC explosion-proof enclosure heater designed to provide freeze and condensation protection in small spaces. The XPMC features an anodized aluminum body protecting a Chromalox cartridge heater and is CSA certified for hazardous locations (Class I, Div. 1 & 2, Groups B, C, and D). The compact design is suitable for use in panel manufacturing, gas analyzers, petrochemical processing, pump houses and motor control centers that require an explosion-proof solution to controlling temperature and condensation.
www.chromalox.com

Automotive Scene

Mazda refines the internal combustion engine

By Bill Vance

With the relentless pursuit of electric and fuel cell powered cars, fanned by media hype, it could be concluded that the internal combustion engine has reached the end of its development and will soon be history. This is not the case, however, thanks to clever engineers who are proving there is considerable life left in the old ICE.

Under constant pressure for better fuel economy and lower emissions, the past few years have witnessed specific power outputs soar to well over 100 horsepower per litre, while fuel use and emissions fall.

Mazda Motor Corp.'s ingenious new Skyactive program is an example of the relentless push for improvement. While Skyactiv applies to all aspects of Mazda vehicles: gasoline and diesel engines, manual and automatic transmissions, and platforms and bodies, their new engines are most interesting.

Mazda's new Skyactiv-G gasoline piston engines have industry-leading high 14.0:1 compression ratios instead of currently used 10.0:1 to 12.0:1. This was achieved through several avenues.

The enemy of high compression is premature combustion knock caused by high temperature and pressure. One 14.0:1 enabler is the cooling effect of injecting the fuel directly into the cylinders. Another is lowering combustion temperature by water cooling the recirculated exhaust gas that is introduced by the Miller cycle valve timing, which keeps intake valves open longer. Also, a long 4 into 2 into 1 exhaust manifold configuration prevents the exhaust pressure wave from one cylinder pushing some of an adjacent cylinder's hot exhaust back into that cylinder as it starts its intake phase.

A disadvantage of the long manifold is slower catalyst light-off, which can be alleviated by retarding ignition. Mazda gets away with this by using a cavity in the piston crown and tuning the multi-orifice fuel injection for a stratified charge near the sparkplug, which gives faster burning and reduced time for engine knock.

The first production Skyactiv gasoline engine with these features appeared in the recently introduced 1.3 litre in the Mazda Demio (Mazda2) in Tokyo. It will be followed by a 2.0 litre version. Mazda says the 83 hp, 1.3 L engine gives a 15% improvement in fuel economy, and a similar increase in torque in low- to mid-range speeds.

Mazda's Skyactiv-D diesel engine now under development also breaks new ground. In an era when gasoline and diesel engine compression ratios are converging – gasoline rising and diesel falling – Mazda has gone the furthest yet. Its new Skyactiv-D's common rail diesel ratio is only 14.0:1 (the same as its gasoline engines) rather than the typical 16.0:1 to 18.0:1.

Advanced engine developments along with lighter, stronger more aerodynamic bodies and stop-start capability, as Mazda is doing under Skyactiv, bodes well for meeting tightening economy and emissions standards.

The first production Skyactiv gasoline engine was the recently introduced 1.3 litre in the Mazda Demio (Mazda2) in Tokyo. It will be followed by a 2.0 litre version. Mazda says the 83 hp, 1.3 L engine gives a 15% improvement in fuel economy, and a similar increase in torque in low- to mid-range speeds. View video demo at http://ow.ly/7hM5n.

A diesel uses the heat of compression pressure to ignite its fuel, and 14.0:1 is usually too low to start and run reliably, especially in the cold. To overcome this Mazda fits ceramic glow plugs for starting. It then uses the variable valve lift mechanism to open the exhaust valves slightly during the intake stroke to re-circulate some hot exhaust gas back into the cylinders until stable combustion is reached.

The Skyactiv-D has two turbochargers, a small one for quick low speed boost and a larger one for higher engine speeds. The lower compression and direct fuel injection reduce combustion temperature, which produces less nitrogen oxide and particulates, allowing the engine to meet stringent emissions standards without urea injection and a specialized, and expensive, catalytic converter.

Lower internal operating pressure also means engine components can be smaller and lighter, such as an aluminum cylinder block, which saves fuel by reducing both vehicle mass and internal engine friction. Mazda says its diesel will have 15% lower emissions and be 20% more fuel efficient than present diesels.

Advanced engine developments like higher compression, direct fuel injection, forced induction, Miller cycle valve timing and cooled exhaust recirculation gas are just some of the technologies that will keep the reciprocating engine with us for some time yet. Combining them with more efficient 6-speed manual and automatic transmissions, lighter, stronger more aerodynamic bodies and stop-start capability, as Mazda is doing under Skyactiv, bodes well for meeting tightening economy and emissions standards.

Bill Vance is an automotive journalist & author (bvance1@cogeco.ca).

Medical Engineering

Saving face with 3D technologies

By Mark Sunderland

There was once a time when the shape of internal body parts could only be imagined through the sense of external touch – and this was limited by what was close to the surface of the body.

X-rays and scanning technologies introduced the possibility of seeing these shapes, but it is generally accepted that many people cannot imagine, regardless of plans, elevations, drawings and text how an object would appear in a tangible 3D form.

The difficulties are even greater in the case of articulating parts. For this reason, Shawn Cherewick diversified his existing company, Protowerx Design Inc. (www.protowerx.com) in Langley, BC, and entered the medical market.

Protowerx began as a rapid prototype production shop. However, one evening about seven years ago, Cherewick was watching The Learning Channel and was fascinated to see a 5-axis CNC machine that could duplicate a truck just like his F-350 crew cab, with 0.005 in. tolerance. This began thoughts for a specialty business that could be built around the same technology.

Fired by enthusiasm and convinced of a market, Cherewick began to realize that many disciplines within the medical profession could benefit from 3D printing, CNC machining's cousin. Now, seven years later, Protowerx is creating simple to complex medical models to assist medical professionals from dentistry to general surgery.

Haptics and 3D printing are tools that provide Protowerx an advantage in solving complex medical market challenges

The human body is a composition of hard and soft parts, elastic parts, tubular parts and ball joints. All of this is generally understood, but when there is an anomaly in one particular area that affects the parts contiguous to it, the challenge is to understand it in all its dimensions and learn how best it can be managed or treated.

For example, recognizing a dentist's difficulty in explaining the dysfunction of a particular malformation of the mandible (lower jaw), a suggestion was made that two dimensional x-ray images could be transposed to a medium that would allow the patient (and the dentist) to understand exactly what had to be done and what processes would be required to do it.

Protowerx has eased the challenge with a rapid model making service that enables the practitioner to fully examine the options for treatment in a time frame that was formerly not possible with traditional model making.

Several methods of production were researched before leading to 3D printers from Z Corp. (www.zcorporation.com), and Sensable Freeform, a 3D design and modeling solution, (www.sensable.com), that is designed to model complex organic shapes.

Typically, data is sent to Protowerx as a DICOM file. A file with a DCM extension refers to a Digital Imaging and Communications in Medicine Format Bitmap file. From that point the data is cleaned up – much like text is edited before printing – and sculpted in Freeform to allow for the model to be revised or sectioned as needed for analysis, color or text added, or to add a base structure for display purposes.

Freeform users model with a touch-enabled haptic stylus instead of a computer mouse, allowing the sculptor to literally feel what is being sculpted on screen. This is accomplished with force feedback, whereby the software and motors in the haptic device are programmed to create resistence to the user's hand, so that it feels like the modeler is touching the object on the screen.

The model is then printed on the Z Corp. 3D printer that uses layers of powder and binder to create a 3D object. In medical education, for example, Protowerx produced a 3D replica of a maxillofacial (jaws and face) model. It embodied all the physical characteristics of the subject and allowed students to study it in a manner that wouldn't otherwise be possible.

The potential for the technology and those that can apply it has far reaching benefits to medical science and education.

But receiving a 3D DICOM file and making it spring to life is not merely a matter of pressing buttons. Preparation, transformation, presentation and an understanding of the subject all require the human skills resident at Protowerx.

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

Freeform user models with a touch-enabled haptic stylus instead of a computer mouse, allowing the sculptor to literally feel what is being sculpted on screen.

DPN DESIGN PRODUCT NEWS
VOLUME 39 NUMBER 6 November/December 2011

Published by
Annex Publishing & Printing Inc.
240 Edward Street, Aurora, ON L4G 3S9
Phone (905) 727-0077
Fax (905) 727-0017
EMAIL: nbishop@annexweb.com

Editor - Michael R. Edwards - medwards@annexweb.com

Online Editor - Daniel Comand - dcommand@annexweb.com

Contributing Editor - Robert Colman rcolman@annexweb.com

Editorial Advisory Board:
John Bachmann, Industrial Careers Pathway (www.industrialcareerspathway.org)
Ajay Bajaj, Rotator Products Ltd. (rotatorproducts.com) and Power Transmission Distributors' Association (ptda.org)
Mirek Tokarz, Langen Packaging Inc. (langeninc.com)
Jonathan Loudon, Swave Studios ACID-O (acido.info)
Millan Yeung, Industrial Research Assistance Program, National Research Council Canada (nrc-cnrc.gc.ca/irap)

Group Publisher - Nigel Bishop nbishop@annexweb.com (905)-713-4395

Art Director - Graham Jeffrey

Advertising Sales:
Nigel Bishop - nbishop@annexweb.com
Roger Heritage - rheritage@annexweb.com
Ron Salmon - rsalmon@annexweb.com
Peter Tams - ptams@annexweb.com

Account Coordinator - Alice Chen achen@annexweb.com

Director Manufacturing Group:
Nigel Bishop - nbishop@annexweb.com

President:
Michael Fredericks - mfredericks@annexweb.com

PUBLICATIONS MAIL AGREEMENT PM# 40065710
RETURN UNDELIVERABLE CANADIAN ADDRESS TO CIRCULATION DEPARTMENT
P.O. Box 530, Simcoe ON N3Y 4N5

Printed in Canada
ISSN 0319-8413

Circulation:
Subscriber Customer Service Representative
Nicole Cuerrier - ncuerrier@annexweb.com
Ph: (866) 790-6070 ext 208 • Fax: (877)-624-1940
Mail: P.O. Box 530, Simcoe ON N3Y 4N5

Subscription Rates
CANADA - 1 year $35.00 + HST
U.S. - 1 year $70.00 US
FOREIGN - 1 year $105.00 US (Airmail)

Design Product News is published six times a year for the specifiers of materials and components in product engineering (OEM); in-plant (systems); and design/production engineering (the crucial stage between finished blueprint/CAD drawing and routine mass production).

We acknowledge the financial support of the Government of Canada through the Canada Periodical Fund (CPF) for our publishing activities. Canada

Members of CCAB BPA WORLDWIDE BUSINESS

Products: Sensors

Laser sensor with 15 µm resolution

Baumer has introduced three models to its OADM 13 line of distance measuring laser sensors. The laser class 1 sensors are able to process object reflectivities down to 0.5 %, with software optimized to an ambient light immunity of more 100 kLux. Measuring distances range from 50 to 200 mm at a resolution of up to 15 µm.
www.baumer.ca

Hollow-shaft magnetic rotary encoder

Posital Magnetocode (MCD) absolute rotary encoders now include a hollow-shaft version to mount on shafts up to 20 mm in diameter. The teachable devices are available with analog (voltage/current) or digital electrical interfaces. The measurement technology is based on a rotating magnet and a Hall-effect sensor. The encoders are suitable for applications requiring extended multi-

turn capabilities (up to 8192 revolutions). Digital outputs for the encoders include serial (SSI), CANopen and DeviceNet.
www.fraba.com

Inductive ring sensors

Balluff has introduced inductive ring sensors designed to help whenever the infeed of small metal parts needs to be monitored. The ring sensors are said to be easy to install and they can be mounted side-by-side or stacked. Available in 10, 15 and 25 mm diameter openings, the sensors offer sensitivity adjustment and the ability to adjust the duration of the output signal. Units are connected with an M12 connector and have one LED for power and a separate LED for function indication.
www.balluff.com/BES

Multi-pixel array sensors

Pepperl+Fuchs has introduced RL31-8-H-800 multi-pixel array sensor series. The IO-Link series is said to have a sensing distance up to 3x that of similarly sized sensors, can reliably and consistently detect objects of varied colors without requiring any adjustments or the need to "re-teach," and quickly and easily adapt to multiple and evolving application requirements.

The multi-pixel array design enables the series to be highly insensitive to object color. The sensors detect white and black test objects to <5% difference of each other even over the entire specified sensing range.
www.pepperl-fuchs.us

MM18 photoelectric sensors

Carlo Gavazzi has introduced its PA18 series photoelectric sensors an M18 housing with a reduction in overall length of 40% from the previous series, a radial housing option which provides the means for right angle sensing, a housing design that meets the standards of IP67, IP69K and ECOLAB certification, and when being cleaned, can withstand temperatures to 80°C and pressure to 1450 psi. Sensing ranges are increased up to 150% from the previous generation. Sensing modes include diffuse (1 m sensing range), retro-reflective (6.5 m sensing range), polarized retro-reflective (5 m sensing range), and through-beam (20 m sensing range).
www.gavazzionline.com

Products: Editor's Choice

Quick-clamping shaft collar

Ruland has recently developed and manufactures quick-clamping shaft collars. The shaft collars are uniquely designed with a low-profile integral clamping lever, in contrast to the typical approach of employing separate single or double tangential screws. The design of the cam on the lever and the mating machined surface on the collar assure a tight fit with a maximum axial load of 35 to 120 lb/133 to 489 N depending on the collar bore size. In situations where higher holding power is or clamp axial load is required, the quick-clamping collar is not the recommended choice.
www.rotoprecision.ca

Power redundancy modules

The newly developed Auto Current Balancing (ACB) technology of the QUINT ORING devices from Phoenix Contact doubles the service life of redundantly operated power supply units by utilizing both power supply units to the same extent. The modules work with MOSFET instead of the conventional Schottky or silicon diodes. These regulate differences in the input voltage of up to

300 mV. The load current is automatically distributed symmetrically. This is said to result in up to 70% energy savings in comparison with conventional solutions. The "Redundancy OK" and "ACB OK" floating signal contacts are used for function monitoring.
www.phoenixcontact.ca

Flange rotary bush

NB Corp.'s SREK slide rotary flange bush series offers the benefits of a slide rotary bush with the mounting ease of a flange. No matter the installation direction of this compact unit, because the ball elements of the series are positioned in a cylindrical formation inside the retainer, it smoothly facilitates both rotary and linear motion, the company says.

Though compact, the relatively large steel balls support higher loading. Size ranges are from 6 to 30 mm. Detailed drawings and tables provide dimensional and mechanical information. 3D CAD drawings are available.
www.rotoprecision.com

SMD-terminal block

The 2060 series 2-pole SMD-terminal block from WAGO provides push-button termination/re-terminations for solid/stranded conductors AWG 24–18. With UL/cUL ratings of 9 A/250 V, the 4.5mm tall series is said to be a labor-saving alternative to soldering leads for PCB-based LED products. The push-button functionality is also said to enable correction of wiring errors during assembly of LED devices, e.g., modules and light engines, eliminating costly scrap/rewiring.
www.wago.us

Wireless borescopes

The HHB1800 series of wireless borescopes from Omega feature a wireless probe that can operate the instrument anywhere without a cable. Units record stills or MPEG 4 video and have console, large screen and projected application modes.
www.omega.ca

MOVIGEAR®

Movigear® is distinguished by its high level of system efficiency, a significant factor in reducing energy costs. The integration and coordination of all the drive components lead to a long service life and system availability. Movigear® is an intelligent system with its own control concept. Its high-quality networking helps reduce startup time and supports monitoring and maintenance tasks. When combined with a functional user software, drive tasks can be solved as quickly and easily as possible.

MOVITRAC® LTE B

The range of functions provided by MOVITRAC® LTE B is particularly well adapted to less complicated applications. Its user-friendly design makes integration quick and easy, it also meets the high quality requirements of everyday requirements. The Movitrac® LTE B is also available in IP55/NEMA 12k making it suitable for special ambient conditions. These frequency inverters operate reliably and flexibly even when exposed to dust or water.

PSC

Planetary servo gear units

The low backlash PSC planetary servo gear units are designed for torque classes from 30 to 305 Nm. They are designed to offer the greatest possible flexibility and ROI, as not every application demands machines designed for maximum performance. These planetary servo gear units are the basis for versatile, dynamic, and above all cost optimized drive solutions.

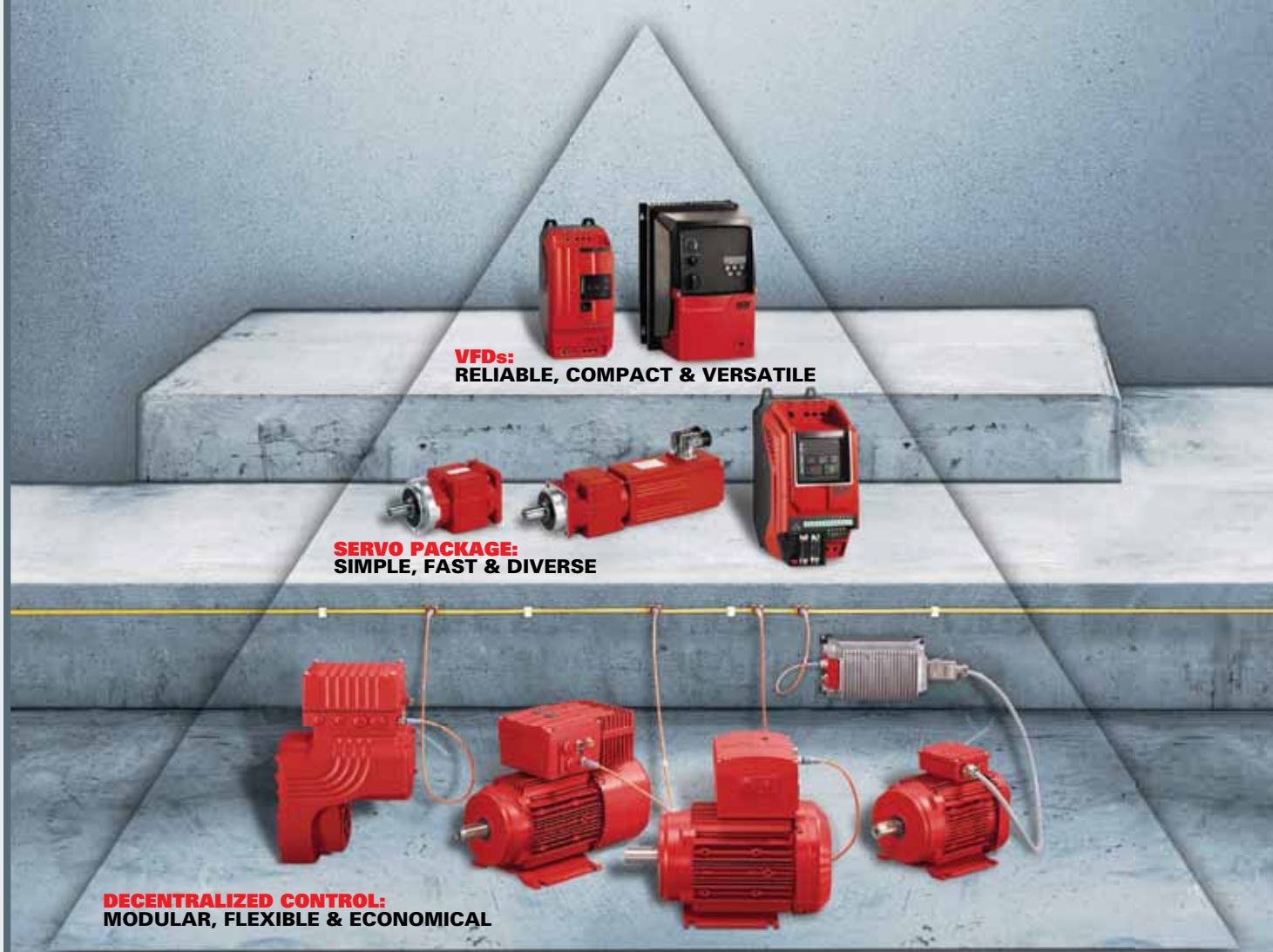
MOVITRAC® LTX

Simple, fast and diverse: as part of the Smart Servo Package, SEW-Eurodrive offers the new Movitrac® LTX servo inverter for universal use. It stands out with advantages such as ease of operation, short startup times as well as optimized costs. Available in two sizes and covers a power range from 750W to 505 kW. The Movitrac® LTX is particularly suitable for use in applications such as secondary packaging, handling, and logistics.

DECENTRALIZED DRIVE SYSTEMS

In many industries and applications, implementing economical automation concepts means utilizing decentralized systems throughout. Long rows of control cabinets with complex wiring, expansive space requirements and long distances between control cabinet and motors are too rigid and not very economical. Only the combination of flexible, versatile, economic and target-oriented modules will provide an efficient solution. This is the reason why system operators opting for decentralized drive systems from SEW-Eurodrive are always ahead of the game.

Our Drive Solution Pyramid.



The demands on material handling systems today have never been more wide ranging or more challenging. That's why SEW-Eurodrive offers drive solutions for every kind of industry application. From the simple to the sophisticated, our pyramid of solutions allow you to control costs and limit complexity by giving you the ability to tailor our products to the exact intelligence and performance specs you require. Reducing energy consumption is also an important imperative today for the modern production line. Just ask Coca-Cola, who achieved a sensational 75% reduction in energy consumption by incorporating 40 of SEW-Eurodrives's revolutionary decentralized MOVIGEAR® units in a recent overhaul of a European bottling plant transport line.

SEW EURODRIVE
Driving the world

Toronto (905) 791-1553 Montreal (514) 367-1124 Vancouver (604) 946-5535 www.sew-eurodrive.ca

Clippard Miniature Air Jets

Clippard's Air Jets are designed to deliver a concentrated flow of air or liquid to a designated location. Featuring a unique ball nozzle design, they are available with a wide range of nozzles, bases and mounting hardware. The ball nozzle accepts a variety of tube configurations that can be aimed and locked into position, enabling them to deliver the air or liquid with precision, and at a very affordable price.

www.clippard.com/airjets-b

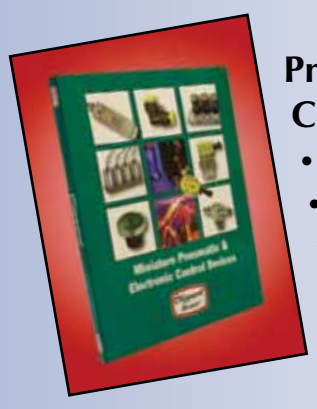
Clippard Minimatic®

Clippard 10 mm & 15 mm Solenoid Valves

Clippard's compact valves offer many features for design flexibility especially in applications with limited space. Available in 2-way or 3-way configurations, as Normally-Open or Normally-Closed, flow rates from 0.5 to 3.0 scfm are available dependent on the orifice size. Other features include highly-visible LED indicator light and manual override, quick response time, and multiple mounting and voltage options. For easy installation and versatility, select from five connector styles.

This dependable line of solenoid valves offer many possibilities for pneumatic applications that require a lightweight, cost-effective miniature valve.

Call Clippard today at 513-521-4261 or visit www.clippard.com/catalog-b to request a free catalog.



Pneumatic Products Catalog

- 360 pages
- Technical Information
- Drawings
- Specifications
- Over 5,000 standard products

Request your free copy today!

Call Clippard today at 513-521-4261 or visit www.clippard.com/catalog-b to request a free catalog.

Hundreds of Options, Models, Applications & Opportunities!

Minimatic® Electronic Control Valves

Wainbee, Ltd.
888-WAINBEE • www.wainbee.com

Clippard Instrument Laboratory, Inc.
Providing innovative solutions for today's engineering challenges
513-521-4261 • www.clippard.com

ADDING VALUE *is our business!*

Clippard's Integrated Solutions Division is dedicated to providing engineered solutions and complete pneumatic assemblies for unique and custom applications. Call today with your specific requirements!

Call Clippard today at 513-521-4261 or visit www.clippard.com/customsolutions-b to request a free catalog.

Two-Hand, No-Tie-Down Pneumatic Safety Circuit (THNTD)

Clippard's VA-023 module is a self-contained modular circuit board with all interconnections required to provide a THNTD pneumatic circuit. The main function is to require a machine operator to use both hands at the same time to actuate equipment, helping to insure that the operator's hands are not in a position to be injured.

Call Clippard today at 513-521-4261 or visit www.clippard.com/THNTD-b to request a free catalog.

Quality Stainless Steel Cylinders

Clippard pneumatic cylinders feature polished I.D 304 stainless steel tubes for low friction. Available in 12 bore sizes with strokes to 40". Precision-rolled construction, clear anodized machined aluminum heads, and rods ensure long life and performance.

- Roller-burnished rods
- Interchangeable design
- Replaceable rod seals
- Long lasting seals
- 100% testing
- Long cycle life

Clippard— The Preferred Cylinder!

Call 513-521-4261 today or visit www.clippard.com/catalog-b to request a free full-line catalog.