JANUARY/FEBRUARY 2020



CANADA'S INFORMATION LEADER FOR ELECTRONIC ENGINEERS AND DESIGNERS



TF Massif taps potential of printed electronics at point of purchase p.8 Edge computing can yield a number of tangible benefits for IIoT p. 14 Fundamentals speed up OEM's journey to digital intelligence p.20 Montreal startup gets the web to meet the physical world p. 10

Access to 8.2 Nillion+ Products Online DGCKERCACA Distribution of the U.S. and other countries. @ 2019 Digi-key Electronics. D'Brokes Ave. South, Thief River Falls, MN 56701, USA



Supporting The Authorized Channel

INNOVATION AWAITS

FROM OUR SITE...





1.800.344.4539 DIGIKEY.CA



DIGIKEY,CA

DIGIKEY.CA

DICIKEVCI

DIGIKEY.CA

TO YOUR DOOR...

*A shipping charge of \$8.00 CAD will be billed on all orders of less than \$100.00 CAD. A shipping charge of \$20.00 USD will be billed on all orders of less than \$100.00 USD. All orders are shipped via UPS, Federal Express, or DHL for delivery within 1-3 days (dependent on final destination). No handling fees. All prices are in Canadian dollar or United States dollar. Digi-Key is an authorized distributor for all supplier partners. New products added daily. Digi-Key and Digi-Key and Digi-Key Electronics are registered trademarks of Digi-Key Electronics in the U.S. and other countries. © 2020 Digi-Key Electronics, 701 Brooks Ave. South, Thief River Falls, MN 56701, USA

SECIA MEMBER





all and

illiiti

INSIDE

Columns

- 4 EDITORIAL Canadian OEMs seek to adopt IIoT tech.
- 8 WEST TECH REPORT BC firm taps potential of printed electronics for POP industry.

In every issue

6 NEWSWATCH 24 NEW PRODUCTS 29 PRODUCT SOURCE 29 AD INDEX 30 WOMEN IN ELECTRONICS Naudia Banton, director of operations at intelliFlex

COVER STORY 10 IOT GETS REELYACTIVE

Montreal start-up creates tech platform where web meets the physical world.

IIOT AT THE EDGE

Edge computing can yield a number of tangible benefits.

20 IIIOT JOURNEY

Five fundamentals to enhance the journey to digital intelligence.

23 IIOT IS BOOMING But why are half of

But, why are half of all IIoT deployments failing?







Cover pl

Canada

Canadian OEMs seek to adopt IIoT technologies



As we welcome in a new decade, Canadian manufacturers of electronic goods and devices are waking up to the changing times in how they go about their business. The Industrial Internet of Things (IIoT) – or as they say in Germany Industry 4.0 - is by far,

having the biggest impact on those ensconced within the manufacturing sphere.

It would also appear that our nation lags behind much of the rest of the industrialized world when it comes to adopting new IIoT technologies. In fact, Canada has fallen behind the curve in a significant enough way to show concern, particularly in regard to European competition. These facts are supported by the results of research conducted by Annex Business Media sister publication Plant magazine, which produced the 2020 Advanced Manufacturing Report.

According to the results gathered, one-third of Canadian manufacturing companies responding to the survey have implemented or are in the process of adopting IIoT, but, two-thirds have not taken any particular action. While that's not surprising – "it is a concern," according to Mike Gillespie, national manufacturing leader at BDO Canada LLP, which sponsored the survey.

Manufacturers around the world are dealing with similar uncertain business environment technologies – but, are being forced to consider how to deploy digital technologies that optimize processes, while making production more efficient.

"I believe government should play a role and there are programs out there. But, there are so many of them, they change all the time, they get funded and then they're oversubscribed. The challenge is finding the right incentives," Gillespie says in the report.

Listed here are some of the study's findings: • Most companies are owned/managed by a generation that may not embrace new technologies. This pattern will likely change over the next 10-20 years. • An aging workforce in decision making roles not trusting newer generation solutions. Middle management is not given the authority to explore new technologies. Individuals do not want to take responsibility for fear of failure.

• Antiquated mentality to adopting new technologies at the same pace as European/Asian companies. The old way of doing things that made the previous generation so successful and its lack of relevance in a globally competitive economy.

"There is a fear factor that Canadian manufacturers are not investing as much as other developed countries in technology. They are at risk of falling behind and being in an unrecoverable position before too long, if they don't modernize their operations," says David Linton, partner and national manufacturing and distribution industry leader at BDO Canada.

Cost

• ability to source new technology in a cost effective way.

• Investment costs are high relative to revenue since the majority of manufacturing enterprises are small firms.

Vision

• Restricted vision. Thinking rules and regulations are more than innovation.

• In general, it's often getting the right level of talent and the right mindset of upper management to invest.

It should be noted that half of the respondents to the 2020 Advanced Manufacturing survey were over the age of 55.

"There is an element to that, that they don't understand what the technology is. If they can't possibly see the value in it, when they don't want to invest," says Linton.

Firms big and small are often left wondering where the funding will come from. Will the company drive the investment, or are there government incentives to access?

"They need to consider this before investing because the overall costs could be quite high," Linton warns. "The execution of a technology roadmap will have a much different price tag for a \$50-million company compared to a \$10-million firm." Linton estimates that most OEMs spend between 2% to 3% of annual revenues on IT.

For the coming years, IIoT is a great concept, but there are practicalities to consider. For manufacturers to chart a path they will need to understand where it could lead and what the benefits would be. Braam Meij, vice-president of industrial sales at Siemens Canada Ltd. says IIoT is not a product that can be bought off the shelf – underscoring the importance of looking at the whole process side.

"You need to have a vision and you have to have a roadmap, but a small organization can't do everything in one go," Meij adds. **EP**&**T**

To receive a free copy of the 2020 Advanced Manufacturing Report – visit www.plant.ca

STEPHEN LAW / Editor / slaw@ept.ca





Canada's information leader for electronic engineers and designers

JANUARY/FEBRUARY 2020 Volume 42 Number 1

EDITOR Stephen Law slaw@ept.ca · (416) 510-5208

WEST COAST CORRESPONDENT Sohail Kamal · sohail@nextgear.ca

senior publisher Scott Atkinson satkinson@ept.ca · (416) 510-5207

MEDIA SALES MANAGER Jason Bauer jbauer@ept.ca · 416-510-6797

ACCOUNT MANAGER Joanna Malivoire jmalivoire@ept.ca · direct 866-868-7089

MEDIA DESIGNER Andrea M. Smith asmith@annexbusinessmedia.com

CIRCULATION MANAGER Anita Madden amadden@annexbusinessmedia.com 416-510-5183

ACCOUNT COORDINATOR Tracey Hanson thanson@annexbusinessmedia.com

VICE PRESIDENT - EXECUTIVE PUBLISHER Tim Dimopoulos

tdimopoulos@annexbusinessmedia.com

coo Scott Jamieson

EP&T is published eight times per year by



ANNEX BUSINESS MEDIA 111 Gordon Baker Road Suite 400 Toronto, ON M2H 3R1 Tel (416) 442-5600 Fax (416) 510-5134 www.annexweb.com

SUBSCRIPTION RATES

Canada – \$58.50 one year; \$94.00 two years USA – \$103.00 per year International – US\$141.00 per year Single copy – Canada \$15

CIRCULATION

amadden@annexbusinessmedia.com Tel: 416-510-5183 Fax: 416-510-6875 or 416-442-2191

ISSN 0708-4366 (print) ISSN 1923-3701 (digital)

PUB. MAIL AGREEMENT NO. 40065710

Return undeliverable Canadian addresses to: EP&T Circulation Department, 111 Gordon Baker Rd. Suite 400, Toronto, ON M2H 3R1



© 2020 EP&T. All rights reserved. Opinions expressed in this magazine are not necessarily those of the editor or the publisher. No liability is assumed for errors or omissions or validity of the claims in items reported. All advertising is subject to the publisher's approval. Such approval does not imply any endorsement of the products or services advertised. Publisher reserves the right to refuse advertising that does not meet the standards of the publication. Occasionally, EP&T will mail information on behalf of industry-related groups whose products and services we believe may be of interest to you. If you prefer not to receive this information, please contact our circulation department

PRINTED IN CANADA

Funded by the Government of Canada Canada



1.800.463.9275 newark.ca

Discover Over a Million Engineering Products

from Suppliers You Know and Trust



900+ new products each week



Custom services such as kitting, panel meters, enclosures, and many more



Market-leading online community of over 600,000 engineers



ЗМ		Amphenol®	
BELDEN	BOURNS	DURATOOL	F:T•N
FLUKE		HARTING	Honeywell
KEITHLEY A Tektronix Company	Electronic Components CHARGED:	KEYSIGHT TECHNOLOGIES	
Life Is On Schneider	maxim integrated.	METCAL	co micro:bit
	molex	multicomp	NP
OMRON	Panasonic	Raspberry Pi*	ROHDE & SCHWARZ
SOLAHD	TDK·Lambda		Tektronix [®]
TENMA	VISHAY.	Weller	E XILINX



5G WIRELESS

ROGERS UNVEILS 5G SMART CAMPUS IN BC

Rogers Communications recently unveiled Canada's first 5G-powered smart campus at the University of British Columbia (UBC), as part of its strategic partnership to advance 5G research in Canada.

The smart campus, which includes 5G towers throughout UBC's Point Grey campus and an edge computing enabled data centre, is being used by university researchers to test 5G applications in a real-world setting.

"With 5G at our doorstep, we're focused on bringing together Canada's brightest minds to research, incubate and commercialize applications that will transform the way we live and work," says Rogers CTO Jorge Fernandes. "Our work with UBC is helping design and test Canada's 5G blueprint – as we prepare our national network for commercial deployment in 2020."

ARTIFICIAL INTELLIGENCE

ABR USES AI ALGORITHM TO EXTEND BATTERY LIFE



Toronto-based developers of neuromorphic computing, Applied Brain Research Inc. (ABR), has unveiled a new algorithm that enables advances in ultra-low-power AI speech, vision and signal processing systems for always-on and edge-AI applications, extending battery life while making them more accurate.

ABR's announcement demonstrates the potential to realize ultra-low-power instantiations of a large class of algorithms that learn patterns in data, spanning extraordinarily long intervals of time.

Current algorithms, like Long Short-Term Memories (LSTMs), can learn and predict sequences of data for long periods of time and make it possible for neural networks to learn to process data like speech, video and control signals. Present in most smart speakers and voice recognition systems, LSTMs are



Rogers seeks to advance its 5G research in Canada with its newly installed smart campus at UBC in Vancouver. said to be the most financially valuable AI algorithm ever invented, according to Forbes. LSTMs fail when tasked with learning temporal dependencies in signals than span 1,000 time-steps or more, making them very difficult to scale and limit commercial application.

The new algorithm - the Legendre Memory Unit (LMU) - is a neuromorphic algorithm for continuous-time memory that can learn temporal dependencies over millions of time-steps or more. The algorithm is a new RNN architecture that enables networks of artificial neurons to classify and predict temporal patterns far more efficiently than LSTMs.

INNOVATION

HALIFAX LAUNCHES INNOVATION OUTPOST

A new initiative aimed at promoting Halifax's emerging startups and business ecosystem has officially opened in Atlantic Canada.

The Halifax Innovation Outpost was made possible via the partnership between Halifax Regional Municipality and the Halifax Partnership, with support from the Province of Nova Scotia. The operation is located at Volta, Canada's east coast innovation hub.

The Outpost aims to provide a platform to address social and civic challenges, improve municipal data transparency, and enable startups and scale-ups to beta test and evolve ideas and products with public, private, post-secondary and community partners.

"This environment gives our innovators and entrepreneurs access to the tools and resources they need to succeed. We know startups and scale-ups need to be able to easily connect with their partners," says Nova Scotia's business minister Geoff MacLellan.

SCALE-UPS

STARTUP EDMONTON COLLABORATES WITH MICROSOFT



Startup Edmonton has formed a new collaboration with Microsoft's global startup program – available in Canada and designed to help startups scale.

Through various joint initiatives, events, and access to tech tools, Startup Edmonton's community of innovators will benefit from Microsoft for Startups expertise and resources. That community includes more than 65 high potential startups in preflight and talent programs and to the thousands of members of the broader tech community.

This collaboration aims to leverage Startup Edmonton and Microsoft for the group's shared goal of nurturing and growing the startup ecosystem in Edmonton with specific events and programming tailored to the community, such as expert-led lunch & learn sessions, office hours, CTO dinner series, as well as custom bespoke events focusing on artificial intelligence, diversity and inclusion.

QUANTUM TECH

U OF WATERLOO FOCUSES ON QUANTUM TECH

Transformative Quantum Technologies (TQT), a research initiative led by the University of Waterloo, recently launched its Quantum Alliance (QA) program, bringing together a collaborative community of researchers, world-class infrastructure and TQT's unique Quantum Innovation Cycle for the advancement of impactful quantum technologies.

QA connects TQT's world-leading quantum experts with industry and other stakeholders to leverage this quantum value chain. QA engages organizations as partners in a consortium, pooling resources and knowledge to develop applications of quantum technology.

"The new program will help build a quantum R&D community and advance the capability and applications of quantum technologies," says David Cory, professor at the University of Waterloo and principal investigator at TQT. "It recognizes that quantum tech will be disruptive in many fields and brings early adopters together with quantum technology experts in a unique shared development space."

TEXTILE COMPUTING

MYANT ENTERS JOINT VENTURE WITH OSMOTEX



Myant Inc., Toronto-based leader in textile computing, has entered into a joint venture with Osmotex AG, Swiss wearables pioneer, for the commercialization of Osmotex's HYDRO_BOT active membrane technology across various textile-based applications.

The integration of HYDRO_BOT's electronically controlled moisture management technology with Myant's existing portfolio of textile-based sensing and actuating capabilities opens up new possibilities across a wide range of domains including sweat/moisture management and thermal regulation.

HYDRO_BOT technology is capable of moving 200 liters of fluid across a square meter of textile every hour via an electroosmotic process, providing a practically limitless ability to manage moisture in textile applications.

Applied in conjunction with Myant's existing capability to deliver heat via textile and to achieve effective passive moisture wicking via novel knitted structures, the combination of technologies is poised to dramatically improve the ability to regulate body temperature in applications such as personal protective equipment for workers in heavy industry, protective



COMMUNICATION

NVIDIA UNVEILS AI SUPERCOMPUTER

name some.

SUPERCOMPUTER

NVIDIA, creator of the graphics procession unit (GPU), has unveiled what it is calling the "world's smallest, most powerful" AI supercomputer for robotic and embedded computing

gear for workers in hot desert-like

climates, performance wear like snow

suits or skiing apparel in cold climates,

footwear and motorcycling apparel to

devices at the edge.

With a compact form factor smaller than the size of a credit card, the energy-efficient Jetson Xavier NX module delivers server-class performance up to 21 TOPS for running modern AI workloads and consumes as little as 10 watts of power.

The device opens the door for embedded edge computing devices that demand increased performance but are constrained by size, weight, power budgets or cost. This includes small commercial robots, drones, intelligent high-rez sensors for factories.

Schleuniger



MultiStrip 9480 with SmartDetect



Highly Innovative Quality Monitoring

The MultiStrip 9480 cut and strip machine is now being offered with SmartDetect for advanced quality monitoring. The sensor-controlled system monitors the complete stripping process in real time and detects any contact between the stripping blades and the conductor, improving production quality without sacrificing high performance.

- The wide monitoring range allows the processing of discrete wire as well as coaxial and multiconductor cables
- Continuously performs a self-test
- Retrofittable at any time to existing MultiStrip 9480 machines
- The S.ON software allows individual tolerance adjustments for each processing layer of the programmed wires

Wire Solutions for a Connected World

To Be Precise.

TF Massif flexes its electronic muscle on the printed electronics industry

Vancouver firm enables electronic displays for POP industry

Specializing in creating printed and extra-large flexible electronics for the point of purchase (POP) display industry, Burnaby BC-based TF MassifTechnologies Ltd. has established a manufacturing process that enables a more cost-effective solution for its customers.

The emerging leader in electronics signage products is finding success in tapping potential applications such as autonomous vehicles, heating elements, large array antennas, as well as other electronics that require large area flexible backplanes. Currently in use by large format print shops, highend electronic displays can be produced using existing large-format manufacturing line equipment, using a process that won Printed Electronics USA's product development award at the 2016 IDTechEx Show.

"We believe that printed electronics has large potential in the POP industry, where flexibility and a need to stand out from the crowd is needed," says Raghu Das, CEO of IDTechEx, about TF Massif's impact on the print industry. "However, the manufacturing process to enable cost-effective printed electronics POP has not been addressed - until now [with TF Massif]."

West Tech Report took the time to catch up with TF Massif's new CEO, Tom Peregoodoff, to find out more about the genesis of the technology, who it benefits, and how the product can be applied in various industries.

It should be noted that the printed graphics space is competitive. It's a race to the bottom, with good profit margins becoming difficult to achieve. according to Peregoodoff.

"We are enabling current manufacturers to expand their product line with minimal capital outlay and minimal technical risk," he says.

Display technology

TF Massif's Lumiere FlexTech display technology enables businesses to differentiate themselves from others the industry by selling a in



TF Massif CEO, Tom Peregoodoff.



value-added service that will create a new type of relationship with their clients. Print shops can now produce electronic signs that can be rolled up to be shipped in a tube and then installed on-site, providing huge cost-savings and design enhancements to marketers. This helps print shops garner better control of profit margins.

"We provide print companies with the opportunity to join in the world of flexible printed electronics and stay relevant by enabling them to produce illuminated displays that attract, connect, engage and interact with their end-users. And, that added-value is worth a lot more to their customers, which leads to higher margins and greater loyalty," Peregoodoff explains.

Alain Carel, TF Massif's founder and CTO, surveyed the print shop industry to find out which print system was the most popular. Zund was TF Massif's design enabling technology allows its products to be managed by smartphones.

chosen as they held a very large market share and the TF Massif's Circuit Fabrication Tool was designed to fit seamlessly into the Zund cutter.

"We checked in with print shops, and we found that they prefer not to have to make a big capital investment, as they already have the Zund cutter," says Peregoodoff.

Conductive backplane

From a strategic perspective, the graphical display application enables the firm to get exposure, but, at its core, TF Massif's product is a design enabling technology.

"It is leading to conversations about many other applications. Engineers can look at the core technology and find ways to use this large-format conductive backplane for their design applications," he says. "For aviation and automotive materials groups, this is a new technology. We are getting the core technology in front of manufacturers, and we are working with them to figure out how it fits into their product."

Perhaps this is also a challenge for TF Massif. Doing something that has never been done before means there is no manual to fall back on. Peregoodoff says zeroing in on a solution too early can drive you down the wrong path, or you might have an innovation that the market is not ready for.

"Focusing on our Minimal Viable Product was absolutely crucial and definitely not easy considering the full potential of the technology. Also, as we exit the R&D stage, we need to ensure we have resources to execute on a large scale and keep space to allow for that innovation," he adds. "The key to managing this to deeply understand where you are in the evolution process and have the courage to admit you cannot do it all. Be sure to bring in the additional resources for the next stage of evolution." **EP**&**T**

Coast correspondent.

sohail@nextgear.ca



TF Massif can be

tfmassif.com.

found at

Credi TF Massif

Made Your Way & Made in the U.S.A.

Interpower[®] manufactures quality cords for global markets. Made in the U.S.A., these cords are available in various colors and lengths and can be made to your specifications.

With a 1-week U.S. manufacturing lead-time and no minimum order or dollar requirements, Interpower can help you design for worldwide markets providing the end user with the correct means of connecting to the local mains supply. Ensure your product is easily adaptable for consumers to use, without any reconfiguration needed on their part.

Pursue quality products that can power your business. Contact Customer Service at Interpower for assistance.

Let Interpower Help You Connect to Global Power

- 1-week U.S. manufacturing lead-time on non-stock Interpower products
- No minimum order or dollar requirements
- Blanket and scheduled orders available
- Same day shipments on in-stock products
- Interpower manufactured cords are 100% tested
- Value-added options available
- Free technical support



Order Online! www.interpower.com

Business Hours: 7 a.m.–6 p.m. Central Time 🛛 🔤 🚥

INTERPOWER | P.O. Box 115 | 100 Interpower Ave | Oskaloosa, IA 52577 | Toll-Free Phone: (800) 662-2290 | Toll-Free Fax: (800) 645-5360 | sales@interpower.com

reelyActive: Where the web meets the physical world

Montreal start-up's technology enables computers to observe in real-time who/what is where/how. BY STEPHEN LAW

> The Internet of Things (IoT), already a movement in the technology industry, is finding innovative ways

of connecting the physical and digital worlds to provide humans with an easier user interface for real life. Montreal-based reelyActive has innovatively captured and commercialized the essence of IoT with its technology platform, which establishes a digital understanding of physical spaces and the dynamics of the people and assets within. A continuous source of data for continuous improvement.

According to reelyActive CEO Jeff Dungen his platform delivers a realtime stream of location and context data with which businesses can continuously improve their operations, maximizing both efficiency and the human experience. The technology employed by reelyActive enables computers to observe in real-time who/ what is where/how, in any physical space, and in a language that they understand.

Founded two years ago, reelyActive's IoT solution connects the physical and digital worlds using 'reelceivers', or little keychain-sized location devices. Physical locations who set up these reelceivers can display on screens who's present and how they're interacting, using social media like Twitter and LinkedIn.

Bricks and Mortar locations can implement them to study the behaviour of their shoppers. The reel can simultaneously support protocols such as Bluetooth Low Energy, supported by the latest smartphones, wearables, and tracking device.

Recently recognized as a start-up leader among its global peers, EP&T sat down with reelActive CEO Jeff Dungen to have him explain the technology he and his team developed.

Q. How would you define your technology company?

You could say that reelyActive is what you might expect if a tech startup and tech activists had a baby. Our team have strong philosophical and ethical views about the future and are working together to develop the technology that advances our vision and mission. I'm quite proud of the fact that we've been able to maintain this balance over the past eight years. It's certainly one of our defining characteristics as a company.

You could say that reelyActive is what to expect if a tech startup and tech activists had a baby. Our team has strong philisophical and ethical views about the future - and we are working together to develop the technology that advances our vision



reelyActive CEO Jeff Dungen and his team have created a platform which delivers a real-time stream of location and context data.

Q. Describe your educational background as a computer engineering graduate from University of Waterloo and how it may have contributed to the creation of reelyActive.

Yes, I studied computer engineering at UW during the rise and pop of the dot-com bubble which offered much wisdom about the realities of tech startups, especially timing and resilience. Computer engineering covered both hardware and software which provided a solid foundation for the creation of reelyActive which innovates in both of these fields. And 4-month co-op work terms certainly taught me to learn fast and get a lot done in a short time which is definitely an asset in any startup!



reelyActive's founding innvoation (and namesake) is a novel daisy-chain architecture that facilitates coverage and provides flexible granularity.

Q. Industry is at the gateway of widespread IoT adoption. How will your technology minimize existing challenges for those navigating the digital transformation?

Industry will definitely drive widespread IoT adoption with the current trend of digital transformation. Ideally, the IoT component of this transformation will combine the in-house expertise of the business with standard commercial platforms and products. We've developed our technology to observe the leading standards (avoiding lock-in and obsolescence) and to facilitate adoption by subject matter experts (rather than IoT technology experts). In other words, any business can comfortably and cost-effectively

advance on initiatives with our platform alone, adding external expertise and third-party platforms when and where necessary.

Q. Describe how reelyActive's open-source software is unique to the existing competitive landscape what will be its greatest impact?

Open source software will be key to widespread IoT adoption, the motivation for our vision. And, from a business standpoint, the benefits of open source are significant, if often misunderstood. For instance, the software must continuously evolve to keep pace with the proliferation of IoT devices and platforms. Open source software has the advantage of accepting contributions from third-party vendors, clients and passionate volunteers to remain on the cutting edge. Although proprietary software products represent a very competitive offering today, over time I think they will lose their edge to actively maintained open source alternatives.

Q. Outline the role your radio hardware plays, as a plug-andplay unit that identifies and locates wireless devices in a controlled environment.

Our hardware acts as the nervous system of a physical space, providing a real-time stream of data to the open source software which can run edge, on-prem or cloud. The hardware serves as infrastructure for wireless devices to be identified, located and to share their sensor data. We initially developed a novel daisy-chain hardware architecture that is well suited to permanent deployments. Based on market interest we later developed our Owl-in-One gateway which supports WiFi connectivity and USB power, facilitating short-term and portable deployments. That's our best-seller today and a successor is in the works.

BILLIONS

reelvActive's

software is

compatible with

radio-transmitting

devices - including

tens of billions of

RFID shipping tags.

Q. Are there any limitations to the types of electronic devices that can be located or accommodated within the reelyActive system?

Our hardware is compatible with active RFID devices which spontaneously transmit to any devices in range. Bluetooth Low Energy has been a game changer in this respect with over a billion devices per year shipping since about 2014. This allows physical spaces to anonymously



Our hardware acts as the nervous system of a physical space, providing a real-time stream of data to open source software, which can run edge, on-prem or cloud

> detect their occupants via the devices (smartphones, wearables) that those occupants already carry. Our software is compatible with any radio-transmitting devices, including passive RFID, of which there are tens of billions of tags shipping annually. Our open source software can of course be integrated with third-party readers and gateways.

Q. The Internet of Things continues to take significant strides in global adoption – connecting the physical and digital worlds. Where do you anticipate the most ambitious use of reelyActive technologies – i.e. commercial, consumer level, B2B usage?

The most ambitious use of our tech will be to usher in an era of digital avatars with the ability to interact with one another and their physical surroundings. Back in 2012 we set up a live directory display in the Founder-Fuel accelerator. By carrying a keyfob, participants would have their profile displayed as soon as they walked in the front door. They loved the visibility this provided them and their startups/ projects. There is no technical barrier to a widespread adoption of such applications (with opt-in of course)!

Q. Given the increased concerns regarding cybersecurity issues, how does your firm allay users fears with your systems/ platforms or potential misuse of data?



We don't store data. It's as simple as that. Our technology provides a real-time stream of data which our users are free to handle, secure and store in accordance with their needs. Moreover, the Bluetooth Low Energy devices that our hardware detects are free to cycle their identifiers periodically to maintain anonymity. Smartphones take advantage of this in the interest of their users.

Q. Describe the development of reelyActive's industrial-grade transceiver infrastructure (hardware)? As well, describe the make-up of your design team.

2012

LAUNCH

reelyActive was

created to meet a

specific need of a

single client - which

has become a

broadly applicable

platform.

The three reelyActive co-founders gained a lot of experience working together at a previous real-time location startup in the 2000s, and noted that many deployments were in harsh environments with limited access to power and wireless networking. The 'reel', our wired daisy-chain architecture of industrial-grade transceivers, was developed to address these challenges. Our design team has generally been comprised of an embedded software expert and a hardware prototyping expert, both with a strong background in RF.

Q. Summarize the journey your firm has taken thus far – versus prior to launch eight years ago.

Our design team has generally been comprised of an embedded software expert and a hardware prototyping expert with strong background in RF

We launched reelyActive in 2012 to meet a specific need of a single client. We knew already then that what we were developing could become a broadly-applicable platform, but it was only once we participated in a startup accelerator that we gave precedence to this big vision. It hasn't been an easy journey. Being ahead of the market, having to develop our own hardware, and choosing the open source model have all been challenging. But, having selected that path, now that the market is maturing, we find ourselves in a unique and enviable position.

Q. You describe reelyActive's vision as ubiquitous machinecontextual-awareness at the 'service of humanity'. Expand upon that if you can.

Think of ubiquitous machine-contextual-awareness as computers being able to sense and understand the physical world in which we live, work and play. For many, that's a scary proposition given their exposure to science-fiction, state-run surveillance and/or the questionable ethics and motivations of tech companies. That's why, for us, it is paramount not only to specify that such technology must be at the service of humanity, but to act consistently and decisively towards that outcome.

Q. Recognized among the top tech start-ups in Canada, what advice would you give to those who are starting down the path of tech creation?

Be resourceful and take advantage of the many programs available to early-stage technology companies. Get a product in market as soon as possible: paying clients provide the best feedback to guide your business and product development. Be tenacious to get across the funding gaps you can expect to encounter. Don't be a humble Canadian when pitching and selling your product - communicate your value proposition and successes loud and clear to the broadest audience. If you're successful, invest your time and winnings back into local tech startups. If you fail, embrace it and invest your experience back into the tech startup community. And don't forget to look out for your peers and to take care of your own mental, physical and financial health. It's a marathon (or rather a series thereof), not a sprint. EP&T

A lot to see for PoE

Coilcraft off-the-shelf PoE transformers for high-power IEEE 802.3bt applications.

Coilcraft has off-the-shelf power transformers for all your high-power PoE applications, up to 71 W (input) at PD!

Coilcraft offers PoE transformers for a variety of power levels compatible with IEEE 802.3af/at, as well as the new high power IEEE 802.3bt standard (up to 71W PD input power).

Available in Flyback and Forward-mode models, our PoE transformers provide excellent power conversion efficiency and high

isolation voltages within the smallest package sizes possible.

They also support a wide variety of standard output voltages to suit a broad array of PoE powered devices.

Learn more about our off-the-shelf PoE power transformers and order free evaluation samples at **www.coilcraft.com/PoE.**







Adding intelligence at the edge

What does it take for the manufacturing and industrial domains? **BY DAVID MANNILA**



For Industrial Internet of Things/Industry 4.0 applications, edge computing can yield a number of tangible benefits, provided you have deployed the right device for the job.

From manufacturing to industrial automation, machines and processes are being connected to share data data that can be used to monitor a process, perform real-time pass/fail control, and analyzed to determine how a process can be optimized and quality improved.

The seamless flow of data, from the process or machine and back to it, is the lifeblood of IIoT and I4.0. But with a centralized network architecture – whether it is cloud-based or on-premise - this flow can too easily become a flood that leads to latency and bandwidth issues.

An edge network can avoid these chokepoints because it uses a distributed architecture in which individual

The seamless flow of data, from the process or machine and back to it, is the lifeblood of IIoT and Industry 4.0. This flow, however. can easily become a flood – creating latency and bandwidth issues

devices with varying degrees of data collection and processing capability (let's call them modules) are located much closer to the network's data sources. This can reduce the load on the network and enable more rapid decision-making.

There are many vendors today that specialize in edge solutions for manufacturing and industrial process control. These include configurable



intent to procure an off-the-shelf solution or custom build your own, the same questions must be asked to ensure you end up with the right tool for the job.

hardware and software components that may or may not provide the range of capabilities and the flexibility that you require. But whether it is your intent to procure an off-the-shelf solution or custom build your own, the same questions must be asked to ensure you end up with the right tool for the job.

1) Size and enclosure matters

In this case, bigger is not better. The smaller the module, the more versatile it can be, to fit where you need it to. It should be a self-contained unit with its own sealed enclosure. That way, in can be externally mounted and easily accessed, in close proximity to the data being collected.

2) Consider the operating environment

The environmental conditions in which the module will operate must also be addressed. Temperature and humidity extremes or risk of physical damage have to be considered with the choice of material and design of the enclosure. Hot environmental conditions, for example, may create overheating issues for the onboard processor and components.

3) And speaking of hardware

What sort of information will be collected and how? This will determine the minimum computing power you will need in the module. With today's technology, more computing horsepower won't impact the module size or environmental requirements. It does, however, make a huge difference in cost.

If the edge module is only expected to take static measurements at intervals measured in seconds or minutes, a low cost, off-the-shelf module may be sufficient. On the other hand, if the module will be sampling continuously at a very high rate - at thousands or even millions of times a second – this can drive the cost of the system much higher.

Right-size for today's needs, but also appreciate that data and processing volumes on the edge will inevitably increase. The challenge is to leave yourself some wiggle room that will prevent the module from becoming obsolete too fast, without overpaying for capacity that you won't need.

4) What type of data is being received?

This is an analog versus digital question. Whether it is an analog signal (measured in voltage, current or resistance) or digital (a stream of discrete ones and zeros) it will dictate the type of data interface and signal conditioning that is required. The module must be designed to handle the maximum possible magnitude of the signal, and have sufficient resolution to detect the smallest desired variation in the signal being measured.

Consider too if the data is being received by other methods - RS-232 for example, or by a fieldbus such as Ethernet IP.

5) What do you plan to do with the data?

Further to the previous point, what do you intend to do with that data? Is the requirement simply to collect and pass it along (whether to an on-premise database or a cloud server)? Is there a requirement to have greater intelligence at the edge, with autonomous decision-making taking place



With today's technology, more computing horsepower won't impact the module size or environmental requirements. It does. however, make a huge difference in cost

within the module based on the data received?

Not only does this dictate the horsepower (and resulting cost) required of the hardware, it also influences the choice of software with which to manage the module. As with hardware, there are plenty of off-the-shelf options for software these days that allow the module to be configured and managed with user-friendly interfaces. There may still, however, be those situations where custom software will have to be developed.

6) What do you want the device to do?

If the module is performing some level of signal processing and analysis on the data it receives, where will that output go? Will it simply be passed along for storage and future analytics, or will it serve as an instruction that is sent back to the data's point of origin - the specific machine or process?

In the latter scenario, the edge module serves as a feedback control device - the control point in a closed loop. This may be in the form of a simple pass/fail output, or could be an analog or digital control signal to correct or adjust the setpoint of the process. If this is the role that the edge module must play, this will again impact the choice of hardware and software.

7) How will the module be accessed?

What kind of accessibility do you want for device configuration and management? You may want an entirely wireless connection, or the ability for remote management from anywhere in the world. Or it may be enough to just be able to plug in a USB cable for access.

In closing

DIGITAL The module must be designed to handle the maximum

possible magnitude of the signal.

ANALOG

VS

Whether it is to qualify an off-the-

shelf solution or to develop the design parameters for your own build, the checklist is relatively long to ensure you have the right combination of hardware and software in each edge module to serve your needs. Ideally, each module should be a self-contained system that fits in the palm of your hand. A decade ago, that idea would have been ludicrous. Today, it's a necessary investment to remain competitive. **EP**&**T**

As a senior Product Manager at Sciemetric Instruments. Dave Mannila has broad responsibility for new product concept, definition and development, as well as maintaining Sciemetric's overall product roadmap.

The Standardization of IoT Cloud Communications

BY BRYAN MANN, DAVID KAUFMAN AND MARK TRAYER

Industry of Things (IoT) analysts predict that more than 25 billion IoT devices will

be connected and participating in the global internet by 2025 (Gartner) and the global smart home market is expected to reach \$1.5 trillion by 2025 (IOT Analytics). This represents a huge innovation and business opportunity for IoT manufacturers' devices and related services in the IoT landscape of the future.

Part of this growth is dependent on device interoperability. A consumer expects to buy an IoT device and have it work with another IoT device. Unfortunately, that isn't always possible. We live in a world of fragmented, 'walled garden' solutions, where a single manufacturer's device speaks a proprietary protocol connected to a proprietary cloud environment with a connection to a vendor-centric mobile application used to configure and control that device. Standards do not apply – mostly.

Make things talk via API

However, there have been successful industry attempts to make things talk to each other using cloud-to-cloud application programming interfaces (APIs).

But, each vendor's device cloud has an API that differs in technical approach and level of complexity. To connect, each vendor must develop and maintain a purpose-built, single APIto-API connection.

For example, a device from Vendor A wanting to be controlled by Vendor B's app requires a uniquely developed and maintained API-to-API connection. And, given all the IoT devices connecting to all the IoT apps, this creates a 'n to n' problem that is just not scalable for the industry. This lack of API standardization forces IoT





vendors, businesses, and consumers to pay the high price of non-standard integrations.

The OCF Universal Cloud Interface is the Cloud API Standard

Recognizing that the IoT requires seamless communication both from a device-to-device, as well as a device-to-cloud-to-cloud-todevice perspective, Open Connectivity Foundation (OCF) has leveraged its existing secure proximal framework technology and associated data modeling to publish the OCF Universal Cloud Interface (UCI). This provides an open, secure, standardized solution, enabling a complete end-end ecosystem without proprietary fragmentation.

The OCF UCI is an API that helps the IoT industry avoid implementing and maintaining numerous proprietary programming interfaces at once. The OCF UCI is built using secure, industry standardized underlying technologies, with OAuth2.0 providing necessary authentication and HTTPS providing secure connectivity.

Well-defined APIs exist for device information retrieval (and update) and event subscription. The APIs are designed to be agnostic of the data models; hence all existing and future data models published by OCF can be used.

The data models describe

payloads for the RESTful verbs and when originating from outside of a cloud (for example, when retrieving an end device's information), are passed through unaltered. The media-type used for the payload can be negotiated using existing HTTP mechanisms via use of the Accept header, at a minimum both JSON and CBOR are supported.

UCI provides an open, secure, standardized cloud-to-cloud API. This, coupled with the existing 'OCF Device to Cloud Services' specification that makes use of the same underlying data models, means that cloud-capable devices need only provide a single interface to the cloud using the same cloud native protocols that are already leveraged for proximal connectivity, as OCF device-to-cloud leverages secure CoAP and the same data models.

The UCI ensures that the device does not need to support any variant, proprietary behaviors that may be driven by different cloud service providers.

To ensure consistency of experience and consistency of capability, OCF already provides a full certification program for devices themselves to assert conformance to the OCF specifications from the perspective of the device.

For the UCI, automated test cases and test tools will enable the conformance of a cloud to be validated from both the origination (of API requests) and target (receipt of API requests) perspectives

Enabling advanced future cloud services

Looking at the future, the UCI will act as the basis for creation of cloud services. Cloud services are important since they can expose data stored in a cloud as a service, without the need to have a proximal device.

Cloud services open up new integrations (based on standards) that were previously not possible. An example of a possible integration is a weather forecasting service to an in-home thermostat where the thermostat can use the predictions to optimize the heating profile of the house.

Other integrations like talking to the infrastructure of a smart city will also be possible (for example, if a leak is detected in a home, the water company automatically turns off the water supply to the house). A further optimization can be that when the demand of electricity is high, devices with Demand Response Load Control (DRLC) can receive DR signaling from the electricity services provider and respond as defined by applicable service contracts or standards (for example Energy Star). New use cases will no doubt emerge when more cloud services and cloud data is made available.

Conclusion

OCF's UCI enables a device to be part of an end-to-end, secure, open, and standardized Internet of Things ecosystem. The use of UCI avoids proprietary fragmentation and support costs associated with the maintenance of multiple different interfaces for the same functionality.

As technology progresses, the use of UCI will enable devices to be part of more advanced use cases across both the smart home and the smart city. **EP**&**T**

Bryan Mann, Lead Architect, IoT Platform at Resideo Technologies David Kaufman, Business Development Director at Resideo Technologies and Vice-Chair of the Certification Work Group of the Open Connectivity Foundation

Mark Trayer, Senior Principal Engineer at Samsung and Chair of Core Technology Work Group of the Open Connectivity Foundation



Custom Electronic Enclosures, Sheet Metal Parts, CNC Machining & 3D Printing

for Engineering, Research & Innovation

Made in 2-3 Days

No Minimum Order



We're Ready to Build Your Design.

Contact Us Today!

1.866.849.3911 | protocase.com

FPGA PLATFORM SERVES WIDE RANGE **OF DEVELOPMENT**

LATTICE SEMICONDUCTOR

Lattice Nexus low power FPGA platform is architected to deliver power-efficient performance that





including AI

for IoT, video, hardware security, embedded vision, 5G infrastructure and industrial/automotive automation. Platform augments the parallel processing and re-programmability of FPGAs with the power-efficient performance required in today's designs.

★ www.latticesemi.com/LatticeNexus

COMPACT TOF **PHOTOELECTRIC** SENSORS DETECT 1.500MM DISTANCE

OMRON AUTOMATION



E3AS Series Reflective-Type Photoelectric Sensors combine accurate detection for diverse targets, enhanced sensing distance, environmental robustness and compact size. Product maintains stable detection without being influenced by varying sensing distances, colors, materials, or surfaces, devices make selection, adjustment and maintenance tasks easier, improving commissioning and operation rates. Product's sensing distance of 1,500mm is five times longer than that of previous models, and the full sensing range of 50mm to 1,500mm eliminates the need to select different sensors for each application.

★ automation.omron.com

AIR VELOCITY SENSORS DELIVER DIGITAL I2C OUTPUT

POSIFZ TECHNOLOGIES

PAV3000 series high-performance air velocity sensors with digital I2C



output and a surface-mount footprint provide thermal management and filter monitoring in space-constrained locations. Unlike thermistor-based solutions, device has a MEMS sensor core that is minimally affected by ambient temperature changes and which provides instant real-time feedback on proper air flow at critical locations. Air velocity data perfectly complements temperature information to provide the best insight into thermal efficiency. Device helps identify areas that require unusually high air flow to maintain stable temperatures, layouts for rack enclosures with air cooling — such as those found in data centers — can be modified to reduce cooling demands for increased energy savings. ★ https://posifatech.com/ air-velocity-sensors/pav3000/

HIGH-RESOLUTION OEM THERMAL **CAMERAS INTEGRATE INTO MANY DESIGNS** SEEK THERMAL



Micro and Mosaic Core series of OEM thermal cameras can be integrated into products and services across several industries, delivering optimal performance in applications such as IoT, test & measurement, security surveillance and beyond. Device's low price per-pixel thermal sensor comes with a tiny footprint, designed for small form factor, low power and lightweight applications. Device's high-resolution (200 x 150) and shutterless design permits uninterrupted, accurate and reliable thermal imaging. Device is customizable for specific applications.

www.thermal.com/oem.html

SLIM SENSOR DELIVERS CALIBRATED DATA WÜRTH ELEKTRONIK

WSEN-PADS compact MEMS-based (Micro-Electro-Mechanical Systems) absolute pressure sensor size is 2.0 x 2.0 x 0.8mm and measures pressure in the range between 26 and 126kPa. Device's output data rate can be selected between 1 and 200Hz. Sensor contains an ASIC (application-specific integrated circuit) and a temperature sensor, which means the output values



are already calibrated. Product offers the possibility of preparing the measured data for various applications using activatable integrated algorithms in such a way that the programming workload for a connected controller is greatly reduced.

Kwww.we-online.com

BLUETOOTH 5.1 SOC ENABLES A WIDER RANGE OF APPLICATIONS NORDIC SEMICONDUCTOR

nRF52833 advanced multiprotocol

System-on-Chip (SoC) is an ultra-low power Bluetooth Low Energy (Bluetooth LE), Thread, Zigbee, and

2.4-GHz proprietary wireless connectivity solution that includes a Bluetooth 5.1 Direction Finding-capable radio and is qualified for operation across a -40 to 1050C temperature range. Device provides a powerful 64MHz 32-bit Arm Cortex-M4 processor with FPU and includes a generous amount of Flash (512 KB) and RAM (128 KB) memory making it suitable for a wide range of commercial and industrial wireless applications. κ nordicsemi.com

COMPACT SMART VISION SYSTEM IS VERSATILE

TELEDYNE DALSA

VICORE dual camera vision system combines a variety of firm's sensor and software technologies to deliver performance, flexibility and ease-of-integration for applications in industrial automation. Versatile system boosts performance for inspection applications using



traditional 2D imaging, thermal imaging, 3D imaging or a combination thereof. Its small, book style format consumes minimal cabinet space and provides convenient, front-accessible connections for cameras, I/O and system components. This includes a dedicated industrial Ethernet port that offers efficient communication with complementary factory devices using Ethernet/IP or Profinet.

k https://www.teledynedalsa. com/en/products/imaging/ vision-systems/vicore/

IC ENABLES ULTRA HIGH-SPEED PRECISION **MOTION CONTROL OF TIME SYNCH ACCURACY** RENESAS



R-IN32M4-CL3 IC for industrial Ethernet (IE) communication delivers support for CC-Link IE Time Sensitive Networking (TSN), a communication standard for next-generation Ethernet TSN technology. Device satisfies the strict specifications of less than one-millionth of a second time synchronization accuracy between applications, accelerating TSN support for applications such as ac servos, actuators, and vision sensors which demands high-speed responsive control, as well as remote I/O widely used in network communication. As a result, users are able to implement ultra high-speed and high-precision motion control. TSN enables seamlessly linked interoperation between information technology (IT) networks and operational technology (OT) networks, allowing product models or production volumes to be changed in real time, while also providing flexible support.

K www.renesas.com/products factory-automation/r-in32m4-cl3. html

Visit ept.ca for the latest new products, news and industry events.





When technology and expertise come together

Phoenix Contact's expertise spans a wide range of applications so that you can make power, control, and network connections with absolute confidence. For bringing power to a device or power to a cabinet, discover the new capabilities within the popular M12 connector family – now capable of 16 amps with 4 positions plus ground. It's a small size with big power from your trusted source, Phoenix Contact. Get amped!

www.phoenixcontact.ca/getamped





An industrial manufacturer's model for transformation

Five fundamentals to simplify the journey to digital intelligence. BY PATRICK LAMM



When a certain German heavy equipment manufacturer started down the digital transformation it had an experienced guide

pathway, it had an experienced guide to show it the way.

That guide wasn't a high-end consultant or a CIO hired away from another organization, but rather a figment of the digital imagination, a model company created solely as a reference case for 'real' companies to follow to accelerate their journey to becoming an intelligent digital enterprise. From initial discovery through to adoption, the model removed much of the legwork and guesswork from the transformation process, giving the German company pre-configured, ready-to-run reference solutions for enterprise-level digital infrastructure and processes. Along the way, it also provided business process documentation, configuration guides, test scripts and other resources tailored to the industry in which the company operates and designed to accelerate the transformation process.

Guided by the model industrial machinery company, the 'real' manufacturer sped through business process validation, scoping and blueprinting to reach the actual realization phase in a mere 12 weeks. Having access to a ready-to-consume model, and involving business users right from the start of the process, made for a fast transition to the realization phase.

As much as companies are spending on digital transformation — an estimated \$7.4 trillion over the next four years, according to IDC — having a model, or at least a set of reference points, for the process is invaluable, particularly in light of the mixed results those transformation investments have yielded to this point.



Estimated spending on digital transformation over the next four years, according to IDC According to recent research by the Everest Group, 73 percent of enterprises failed to realize sustained returns on their digital investments.

Wherever your organization stands in the digital transformation process, there's something to learn from the failures and the successes others have experienced during that process. Here, drawing on SAP's experience helping a wide variety of industrial manufacturers evolve into intelligence enterprises, are five fundamental elements that tend to be present in successful digital transformation efforts:

1. Customer centricity.

Within five years, industrial equipment companies will earn a majority of their revenue from services rather than from the products they make. Already, industrial manufacturers are reimagining their businesses by packaging their products with the intelligent services

There are five fundamental elements that tend to be present in successful digital transformation efforts

that help customers to operate more efficiently and cost-effectively, which in turn helps manufacturers to forge stronger, lasting relationships with those customers. MAPAL, which offers precision tools and machining solutions, was well aware of the challenges its customers face in managing and maintaining tools. So the company created a "data highway" in the cloud where customers and partner suppliers are linked and can access all data related to a tool throughout its lifecycle - master, transaction, process and inventory. The open cloud platform, called c-COM, also features a native app that tool managers can use to access relevant information about a tool, to remotely view its condition, create a service report if needed, then send that report straight to the supplier. The app also can generate a purchase order for a tool that needs replacing.

2. Serving the segment of one.

As more customers demand products tailored to their specific needs, manufacturers are developing mass-customization, "segment of one" production capabilities to be able to profitability deliver customized products. Doing so requires a digital platform on which various entities along the supply chain (manufacturer, component supplier, customer, etc.) can collaborate to co-develop products (and product/service bundles; more on that in a moment). With embedded machine learning and artificial intelligence tools in the cloud, plus data from sources along the supply chain, such a platform can enable a manufacturer to differentiate core production processes, and to speed and improve decision-making during the collaborative design and development processes.

3. Digital smart products.

Manufacturers are making smart products that are connected to

the real world, self-aware and capable of collecting data that customers can leverage in a variety of ways. Stara S/A Industria de Implementos Agricolas, a major Brazilian agricultural machinery and services provider, has transformed itself from purely an equipment manufacturer into a provider of customer-focused precision farming solutions. By equipping its farm equipment with IoT-connected sensors, customers can monitor farming processes in real time to operate more efficiently. For example, they can access and analyze live data to determine the optimal quantity of seeds to plant based on varying soil characteristics at different points in the field. Now, more than 20 percent of Stara's revenues comes from computer hardware and software.

4. Digital supply chain and smart factory.

The industrial Internet of Things, in tandem with the right digital analytics tools, has empowered companies such as Caterpillar to optimize, extend and transform their business, from R&D to the factory floor, all the way out to customer equipment deployed in the field. Not only has Caterpillar automated its factories with IoT-connected equipment, it is equipping the products it builds at those factories with IoT sensors that gather data the customer and the manufacturer can share to improve predictive maintenance, increase overall product uptime and extend lifecycle.

5. Servitization and new business models.

Today's customers want their equipment to come "as-a-service," where they pay for the usage or outcome surrounding a connected product, with remote monitoring, analytics, preventative maintenance, real-time issue resolution, etc., part of the service package. Not only does the end customer get the desired outcome, they shift what can be an onerous capital expense into an operating expense. For example, Kaeser Kompressoren, which provides compressed air solutions for a range of applications, now offers compressed air as a service, so instead of investing in a full compressor station, customers pay only for the compressed air they use. Under the Sigma service, Kaeser builds, installs, operates and maintains the system on the customer's behalf. The customer pays a fixed price for the air but leaves maintenance, monitoring, parts

replacement, etc., to Kaeser.

As successful as Kaeser's Sigma service, as well as other digitally-driven, cloud-focused initiatives by Mapal, Stara and Caterpillar, are proving to be, they serve as real-life models for how to execute digital transformation to benefit the customer and the manufacturer's own bottom line. **EP**&**T**

Patrick Lamm is senior director of the industrial machinery & components business unit at SAP. He has more than 20-years' experience in discrete manufacturing at leading global companies.



Compact & Fanless Embedded System

- I 6th/7th Generation Intel[®] Core[™] Processor
- I 2 DDR4 SODIMM up to 32GB
- 1 2 GbE, 4 USB 3.0, 2 USB 2.0
- I Supports 1 Mini PCIe, 1 M.2
- Т 2 HDMI Support 4K Resolution
- Wide Temperature: -20°C to +40°C
- Supports Win 7, Win 10, Linux
- 15-Year CPU Life Cycle Support



Western Canada SHERMAN SUM Sherman.sum@dfi.com G04-512-2812

Eastern Canada CLAUDE WHISSELL

More Info

☑ claude.whissell@dfi.com 613-242-2352



Canada's Leading Electronics Market Resource.





EP&**T** has been a long-standing, preferred media partner with us for years. The team is responsive, friendly and professional! Our customer base turns to **EP**&**T** for industry and product news. With that in mind, on top of their expansive national mailing list, it only makes sense to continue our marketing efforts with **EP**&**T**.

Electro Sonic — A Master Electronic Company



MARCH-APRIL ISSUE: TRANSPORTATION

Tech Update Newsletters: March 9 – Optoelectronics March 16 – Medical Electronics March 23 – Semi-conductors April 6 – Transportation April 20 – Connectors

MAY ISSUE: MEDICAL ELECTRONICS

Tech Update Newsletters: May 11 – Switches & Circuit Protection May 25 – Power Management

CONTACT:

Scott Atkinson | Publisher | 416-510-5207 | satkinson@ept.ca Joanna Malivoire | Account Manager | 866-868-7089 | jmalivoire@ept.ca Jason Bauer | Media Sales Manager | 416-510-6797 | jbauer@ept.ca

EPT.CA

IloT market is booming

So why are half of all IIoT deployments failing? BY ALEX WEST

The global Industrial Internet of Things (IIoT) business is arriving at a tipping point, with the industry reaching a connectivity milestone this year that will pave the way for market-changing events like the proliferation of cloud-based technologies. These developments will help propel annual IIOT node shipments to 224 million units in 2023, a 100-million unit increase from 124-million in 2018, according to IHS MarkitTechnology, now a part of Informa Tech.

However, despite the industry's progress, about half of all IIoT deployments are failing. All too often, these deployments are being hamstrung by planning breakdowns, including the failure to set reasonable objectives and to gather support and cooperation from critical personnel within organizations. Without addressing these issues, the global IIoT market could face major challenges in reaching its growth potential (see chart). node shipments next year, compared to 41 percent for Fieldbus.

"There are now more than 1-billion connected devices on factory floors around the world," says Alex West, senior principal analyst, industrial technology, at IHS Markit Technology. "This massive installed base is about to reach a tipping point, with Ethernet overtaking Fieldbus in 2020. The proliferation of Ethernet is enabling the transmission of larger volumes of data. This will ultimately bring in technologies like the cloud that are going to supercharge the IIOT business."

Connecting to reduce downtime

The arrival of a faster connectivity solution will allow manufacturers to utilize cloud-based solutions to reduce downtime.

"One of the really significant challenges faced by industrial companies is unplanned downtime,"West adds. "Just to quantity that challenge, it's estimated in the automotive industry that

At the proof of concept stage, about half of IIoT projects are failing – which is acceptable for companies attempting to be agile and trial new applications. There is a similar failure rate when companies move to the deployment stage

The connection inflection

Industrial assets have traditionally employed fieldbus for connecting to the industrial network, and while Ethernet solutions have been in place for a couple of decades, their adoption has been slow. However, after years of making progress in the market, Ethernet is set to displace Fieldbus as the primary network medium for the first time in 2020. Ethernet will account for 43 percent of IIOT \$20,000 to \$30,000 per minute is lost through unplanned downtime. New applications enabled through IIoT, maintenance and asset-health monitoring, are really helping overcome these challenges. We've estimated around a 30 percent average saving or reduction in unplanned downtime can be achieved through industrial IoT solutions."

Monitoring assets

The benefits of IIoT solutions



Image source: IHS Markit Technology.

facilitated by enabled devices can be realized across the entire lifecycle of production, from product design, to monitoring inventory levels in the supply chain.

For example, Harley Davidson, a few years ago was facing business challenges in terms of fulfilling customer requirements. By improving the connectivity of its plant, the company was able to reduce the time to meet new orders filled from 21 days down to six hours.

Addressing IIoT deployment fails

While faster connectivity holds great promise for expanding the IIoT market, the reality is that current deployments are failing as often as they succeed.

"At the proof-of-concept phase, about half of IIoT projects are failing—which is acceptable for companies attempting to be agile and trial new applications," West says. "However, there is a similar failure rate when companies move to the deployment stage. This means companies are investing enormous sums in these projects but aren't getting the payback they expected."

The failure of a project is

defined as not meeting the customer's expected payback. Many times, the high failure rate can be attributed to inflated expectations. A total of 50 percent of companies expect to see payback within one year, although many of these projects can take much longer to generate returns.

IHS Markit Technology recommends manufacturers take the following steps to increase their chances of IIoT success:

- Specify the project by determining in advance which exact challenges you want IIoT to address.
- Start small, with some pilot projects of concepts to see how the technology can be utilized.
- Go right to the top, with senior-level management support for projects.
- Get the urge to converge, by ensuring support from all relevant functional groups.
- Leverage your people power, by getting staff involved with deploying the technology and encouraging them to view IIoT not as a threat, but as an augmentation to their job capabilities. **EP**&**T**

Alex West is senior principal analyst, industrial technology at IHS Markit.

HS

Charto:



WALL MOUNT/DESKTOP PLASTIC ENCLOSURE FAMILY MEETS IP68

HAMMOND MANUFACTURING 1557 family of wall mount/desktop plastic enclosures come in four plan sizes, each in two heights. Units are available in polycarbonate, sealed to IP68, and ABS, designed to meet IP66. The sizes are 80 x 80 x 45 and 60mm and 120 x 120, 160 x 160 and 200 x 200 in heights of 45 and 70mm. All versions are available in black and RAL 7035 grey. Rounded corners and top face give a modern smooth style, and environmental sealing allows units to protect the housed equipment against dust and water entry. www.hammfg.com/electronics/ small-case/plastic/1557

CHIP-SCALE HAPTIC IC DRIVES HD TOUCH IN TINY DESIGNS

BOREAS TECHNOLOGIES



BOS1901CW Wafer Level Chip Scale (WLCSP) version of firm's flagship low-power piezoelectric driver integrated circuit (IC) for high-definition (HD) haptic feedback in mobile and wearable consumer products. Featuring WLCSP packaging, device is 2.1x2.2x0.6mm and consumes one-tenth the power of its nearest piezoelectric (piezo) competitor. Device provides 10X power savings over other piezo solutions and delivers 4X to 20X power savings over other incumbent technologies (LRA, ERM).

★ www.boreas.ca/products/ bos1901-development-kit

'ZERO' HEIGHT THREADED INSERTS SERVE PCBS

EMX ENTERPRISES

Keystone series of ultra-low profile, surface mountable threaded inserts are packaged for use on pcbs in the same manner as other SMT components. Manufactured from steel with a tin plate, devices simplify method of adding threads to a pcb, while utilizing the same equipment as with other SMT components; resulting in a reduction of handling time or damage



that may occur while using traditional threading methods for a pcb. Devices are available in 2-56, 4-40 and 6-32 threads with .012" low profile height. Devices are supplied on tape and reel with Kapton tape on top surface for easy pickup.

★ www.emx.ca





Employing a highly time-efficient table-top display format, EPTECH shows target electronics designers, engineers, technicians, technologists, purchasers, technical managers and researchers.

EPT.CA/EPTECH/EXHIBIT/

Scott Atkinson, Senior Publisher ↓ 416-510-5207 ■ satkinson@ept.ca

SEALANT IS THERMALLY CONDUCTIVE, CHEMICALLY RESISTANT MASTER BOND



EP62-1AO two part epoxy adhesive and sealant provides long working life of 12-14 hours at ambient temperature for a 100 gram mass. This makes it beneficial when bonding and sealing large or intricate parts that may need ample time for mixing and applying. Material has a high strength profile with a tensile modulus of 600,000 to 650,000psi and a tensile strength of 5,000 to 6,000psi. The service temperature range is -60°F to +450°F and delivers a glass transition temperature of 120-125°C. Product delivers a value of 9-10 BTU · in/ (ft2·hr·°F), or 1.30-1.44 W/(m·K). ★ www.masterbond.com/ applications/sealing-applications

650W AC-DC POWER SUPPLIES BOOST DENSITY

MURATA POWER SOLUTIONS PQU650 series of open-frame, 650W-rated ac-dc power supplies provide high power-density, with forced air- and convection-cooled ambient ratings. Units deliver a multitude of standard features including wide output voltage adjustment range, auxiliary power rails and a high transient capability at a competitive price. Measuring 6" x 4"



by 1.75" (1 U), product accept a universal ac input voltage range of 90Vac to 264Vac. Utilizing the latest LLC topology results in world-class efficiency levels of up to 95%, product series maintains a high 450W convection-cooled rating. This means there are no system fan requirements for applications up to 450W at ambient temperatures as high as 50°C, and with as little as 300 LFM forced air-cooling.

🔭 murata-ps.com

EV AUTOMOTIVE FUSE SAFELY INTERRUPTS UP TO 1000VDC

SCHURTER

AEO 10.3x38mm midget-fuse series safely interrupts short circuits up to 20kA at 1000/800VDC, with a current rating range of 10-50A. Suitable for battery protection in electric vehicles, product series offers mounting versatility in addition to its remarkable high performance. Fuse meets reliability specification according to AEC-Q200

and is UL approved. Mounting options include compatibility with firm's



heavy duty CSO fuse clip designed for voltages up to 1500Vdc, and currents up to 32A.

DESIGN

SOURCE

★ www.schurter.com/datasheet/ AEO_10.3x38

COAXIAL CABLE STRIPPING MACHINES BOOST PRODUCTION SCHLEUNIGER

CoaxStrip 6380 next generation benchtop coaxial cable stripping machines delivers a 20% increase in production output. Series programmable, multi-step rotary strippers allows for precise stripping of coaxial, triaxial and multi-conductor cable, as well as single conductor wire. Units also provide 'Cable End Detection' for higher strip length precision, 'Cable Diameter Verification' for quality assurance, an 'Automatic Cable Retraction Function' for easier processing of long strip lengths, and new stripping head designs to ensure that even very thin, hard-molded or slightly out-of-round insulations can be stripped. www.schleuniger.com



CONTACT US TO BOOK YOUR EXHIBITOR SPACE TODAY!

Joanna Malivoire, Account Manager 1-866-868-7089 ■ jmalivoire@ept.ca Jason Bauer, Account Manager 416-510-6797 ■ jbauer@ept.ca

SPLICING CONNECTORS SERVE EXTREME APPLICATIONS

WAGO



221 EX Series Lever-Nuts for extreme or harsh applications delivers similar features of the 221 LEVER-NUTS. The splicing connectors obtain AEx (class 1, zone 1) rating when used in conjunction with the mounting carrier, which can either be clamped onto a DIN rail or screwed tightly to any smooth surface. Product series comes with 2-, 3- and 5- conductor wiring options, as well as lever actuation for quick and easy installation. Device accommodate 24 - 12 AWG; solid, stranded, flexible and tin-bonded wiring. K www.wago.com/221/us

EMC FILTERS PROVIDE MIL-STD VOLTAGE SURGE PROTECTION

FQB series of **EMC** filters come with a rating of 40Vdc at 20A. Voltage surge and

spike protec-



tion for dc-dc converters is accomplished through the use of active technology. Product series comes in a rugged encapsulated quarter-brick package with a choice of flanged or non-flanged baseplates. Modules are suitable for use in a wide variety of harsh and demanding environments, including MIL-COTS vehicle and airborne applications. Devices deliver a high differential and common mode noise attenuation, simplifying system level compliance to the MIL-STD-461(F, G) standard. Modules also provide input spike and surge protection per MIL-STD-1275(D, E) and RTCA/DO-160G (Sec 16-18).

www.us.tdk-lambda.com/lp/ products/fq-series.htm

EC FANS SERVE POWER-HUNGRY APPLICATIONS ORION FANS

Electronically Commutated (EC) family of fans now includes 11 new



models to meet a wide range of ac application requirements and expand design options. Products feature 7 new frame sizes with CFMs ranging from 39CFM to 220CFM. Units provide a low power, energy-saving cooling solution for ac applications. By maintaining the same interface between the fan and equipment, EC fans can be used as drop-in replacements for equivalent-sized ac fans. The ac input fans utilize a brushless dc motor and incorporate voltage transformation within the motor for significantly lower power consumption. The line includes 60mm, 80mm, 92mm, 120mm, 172mm, 250mm and 254mm models.

▼ orionfans.com/group. php?name=EC%20Fans&k=3

SPE PUSH-PULL CONNECTOR IS COMPATIBLE WITH UNSHIELDED TWISTED PAIR

LEMO



1000 Base T1 single pair Ethernet (SPE) push-pull connector is based on transmission standards (IEEE 802.3), single-pair Ethernet (also called SPE or 1000Base-T1) and is integrated into new generations of automobile designs. Device is designed to operate over a single twisted-pair copper cable supporting an effective data rate of 1Gbit/sec in each direction simultaneously. Firm provides two types of insulators oB.511(2 contacts) and 1B.512 (4 contacts + screen) compatible with Unshielded Twisted Pair (UTP) and Shielded Twisted Pairs (STP). Product is available in the B series and also in a watertight version called the T series connector. Devices are initially designed for automotive and industrial data transfer. The role of

SPE is also to gain space and weight (with a more simple cable) and can be used in other markets such as machine, robotics and rail technology.

★ www.lemo.com

COMPACT POWER INDUCTORS OPTIMIZED FOR 48V CAR DESIGNS COILCRAFT



AGM2222 Series power inductors provide current ratings up to 110 Amps and low DCR in a package measuring 22 X 22 X 23mm, a 73% volume reduction from previous-generation products. Improvements in power density makes device suitable for high-current applications including automotive bi-directional 12V – 48V dc-dc converters. Product series is available in 13 inductance values from 1.9 to 10µH. It is qualified to AEC-Q200 Grade 1 (-40°C to 125°C ambient).

K www.coilcraft.com

PROBE STATION MEASURES ON-WAFER S-PARAMETER MEASUREMENTS





FormFactor Genius Education Kits for RF and Microwave S-Parameter measurements serve as an entry level 150mm probe solution for universities and schools, completely validated and proven to deliver leading-edge performance measurements. Kits include all the critical components to make the measurements you need, including probe station, probes, probe positioners, cables, calibration substrate and WinCal XE calibration software - as well as a Keysight Streamline Vector Network Analyzer. All controls are easily accessible and allow precise and ergonomic operation.

★ tmetrix.com/

POWER TRANSFORMER ENHANCES DC-DC POWER CONVERSION EFFICIENCY

BOURNS

Model SM13117EL flyback power transformer line is designed to support IEEE 802.3 af-compliant, integrated



Power-over-Ethernet (PoE) Powered Device (PD) and Pulse Width Modulation (PWM) controller applications. Device provides dc-dc power conversion in isolated mode, delivering 13 watts of output power, 36 - 72Vdc/ 250kHz input, 12Vdc/1.08 amp output and 1.5k Vrms withstanding voltage. The low profile, small form factor PoE device provides an extended -40 to +125°C operating temperature range, low leakage inductance and improved EMI performance.

K www.bourns.com/docs/ product-datasheets/sm13117el.pdf

12G MCX CONNECTORS FACILITATE 4K ULTRA HD BROADCAST HEILIND ELECTRONICS



Amphenol RF 12G MCX line of connectors include high-frequency BNC and HD-BNC devices that provide single-channel transmission of 4K and Ultra HD quality signals, and support data transfer rates of 12Gbps per SMPTE standards. Products provide 75-ohm impedance, a convenient microminiature package size and push-on coupling for ease of use. Devices are available in both pcb and cable-mount configurations and are designed to terminate connections in applications too small to support BNC and HD-BNC configurations. Devices transmit high-resolution, uncompressed video signals in applications.

★ www.amphenolrf.com/connectors/mcx.html

SUPPLY SIDE

TEST & MEASUREMENT

cadence aligns with NI

National Instruments (NI) Corp. and Cadence Design Systems Inc. announced a system innovation strategic alliance to create an integrated design to test flow, leveraging reusable data and test IP from electronics design and verification to validation and production test for electronic system and semiconductor companies.

This partnership builds upon earlier collaboration between NI and Cadence, initiated to improve the overall semiconductor development and testing of next-gen wireless, automotive and mobile ICs and modules. Both firms aim for the joint development of technology, methodology and intellectual property to streamline electronics development.

ROHDE & SCHWARZ CLOSES TIES WITH QUALCOMM

Rohde & Schwarz, global supplier of test and measurement solutions to the wireless industry, has licensed Qualcomm Technologies' Interface Control Document for 5G, that describes the unique messages that come from the Snapdragon X55 5G Modem-RF System. For Rohde & Schwarz, access to these messages is critical to the development of test solutions such as QualiPoc, for example, that captures and analyses these messages for determining network quality and customer quality of experience.

Any type of interaction between a mobile device and the mobile network requires hundreds, if not thousands, of unique messages that are sent back-and-forth that verify all aspects of a mobile phone call or data session. The quantity and complexity of messaging continues to increase as more features and capabilities are added. This trend will no doubt continue as the industry begins to migrate from 4G/LTE to 5G.

INDUSTRY 4.0

COGISCAN PARTNERS WITH CRITICAL MANUFACTURING

0 Cogiscan

Cogiscan Inc. Bromont QC, a leading connectivity solutions provider

 Paperner C.

 Personal C.

 Persona

QualiPoc Android smartphone troubleshoots voice and data service quality & RF optimization.



UofA grad Sawyer McPherson joins Eleven Engineering. for the electronics manufacturing industry, has partnered with Critical Manufacturing to deliver smart factory solutions for electronics manufacturers.

Critical Manufacturing's Augmented MES solutions, in combination with Cogiscan's Co-NECT machine connectivity technology, will aim to deliver solutions that allow electronics manufacturers to achieve the digital transformation necessary to revolutionize their operations. Based in Porto, Portugal, Critical Manufacturing is a global leader in the area of MES for Industry 4.0.

The joint solutions resulting from this partnership will deliver both the deep machine connectivity and robust MES business logic enabling the high performance necessary to succeed in a highly competitive, rapidly changing environment. The end result will be enhanced productivity and quality for customers through modern, data-driven manufacturing execution.

SEMICONDUCTORS

GAN SYSTEMS GAINS ISO 9001:2015

Systems

GaN Systems, Ottawa-based provider of GaN power semiconductors, announced it has received International Organization for Standardization (ISO) 9001:2015 certification for the design and manufacture of power semiconductor products. Both GaN Systems' Canadian headquarters and Taiwanese operations facilities received ISO certification from the British Standards Institute (BSI), the world's first national standards body and one of the largest. The ISO 9001:2015 certification standard is the most recent version with significant enhancements since the last ISO 9001:2008 update.

ELEVEN ENGINEERING ADDS TO DESIGN TEAM

Eleven Engineering Inc., a market leader in semiconductor products for wireless audio, has broadened its design engineering team with the addition of Sawyer McPherson, a graduate from the University of Alberta with degree in Engineering Physics.

"Sawyer is an exceptional

engineering grad with a tremendous amount of raw talent", said John Sobota, Eleven Engineering CEO and director. "The emerging SKAA standard for wireless audio is continually being improved by our outstanding R&D team, and its youthful enthusiasm, creativity, and engineering chops, such as Sawyer's, which give SKAA its novel vitality. SKAA's positioning as having 'best ease-of-use and best flexibility' demands a special flavor of uncompromising innovation from our developers, and Sawyer fits the bill perfectly."

RENESAS EXPANDS ACCESS TO IP LICENSES

Partner introduction to support user system



Renesas Electronics Corp., supplier of advanced semiconductor solutions, has expanded access to its highly sought portfolio of intellectual property (IP) licenses that allow designers to meet a broad range of customer requirements.

Customers now have access to IPs such as advanced 7nm (nanometer) SRAM andTCAM, and leading-edge standard Ethernet time-sensitive networking (TSN) IP. Renesas is also working on providing a system IP that includes PIM (processing in memory). With these IPs, customers can jump start their advanced semiconductor device development projects, such as the development of next-generation artificial intelligence (AI) chips or ASICs for leading-edge 5G networks.

ACQUISITIONS

MACDERMID ALPHA ACQUIRES KESTER



MacDermid Alpha Electronics Solutions has acquired Kester, a global supplier of materials used in electronics assembly and semiconductor applications.

Kester, a division of Illinois Tool

SUPPLY SIDE

Works and based in Itasca IL, has manufacturing facilities in the U.S. and Germany and serves a global customer base in consumer electronics, telecom, medical, automotive and MILaero markets.

The purchase aligns with MacDermid's strategic goals and priorities and has said that Kester's products and development initiatives will enhance programs in the Mac-Dermid Alpha pipeline and enable the company's continued focus on high-growth segments such as automotive, PV, consumer, and communication, a press release stated.

TT ELECTRONICS ACQUIRES EXCELITAS

TECHNOLOGIES*

TT Electronics, global provider of engineered electronics for performance critical applications, has agreed to acquire Excelitas Technologies Corp, Covina CA, makers of power electronics for defense and aerospace markets.

"This acquisition will help us move up the value chain and add the ability to engineer entire power convertors to our core power electronic capabilities in aerospace and defence.," says Richard Tyson, CEO, TT Electronics commented:

STANDEX TO BUY MAGNETICS LEADER TOROTEL



Standex Electronics, manufacturers of reed switches, relays and sensors plus hall effect sensors, has achieved a definitive agreement to acquire Torotel Inc., leaders in custom high reliability magnetics assemblies.

With headquarters in Olathe KS, Torotel employs 174 people and also has operating facilities in Hatfield PA. The move provides Standex with added technical and application expertise and strengthens its value in the military and aerospace markets.

NXP ACQUIRES MARVELL'S WI-FI, BLUETOOTH ASSETS

NXP Semiconductors has acquired the wireless connectivity portfolio from Marvell, credited for revolutionizing the digital storage industry by moving information at speeds never thought possible.



"We are pleased that the closing of this deal is upon us, and ahead of schedule," said Rick Clemmer, NXP CEO. "Marvell's world-class engineering team and industry-leading connectivity product set, especially the disruptive Wi-Fi 6 portfolio, will immediately complement NXP's processing, security and connectivity offerings in the Industrial & IoT, as well as in the automotive and communication Infrastructure markets."

GOWANDA ACQUIRES RCD COMPONENTS



Gowanda Components Group (GCG) recently acquired RCD Components, Manchester NH, manufacturer of passive components – including resistors, capacitors, coils and delay lines – for the commercial, military and aerospace industries.

ARE YOU IN?

Electrosource, Canada's only Electronics industry Buyer's guide is coming February 2020.

Electrosource provides year-long advertising exposure to those purchasing electronic products and services.

This comprehensive resource is mailed to EP&T's circulation list and is distributed at each of EP&T's Eptech shows across Canada.

Make sure your company is listed. Check out the buyer's Guide online at: https://www.ept.ca/digital-archives/ electrosource-source-guide-2019/

Make sure your company is listed!

For more Information please contact: Jason Bauer, Media Sales Manager, jbauer@ept.ca Or Joanna Malivoire, Account Manager, jmalivoire@ept.ca



PRODUCT SOURCE GUIDE

"This acquisition expands the breadth of Gowanda's passive component offerings to the electronic design community and enhances our passive technology capabilities," says Don McElheny, CEO of GCG.

GCG has stated that RCD will maintain its operations in Manchester, as well as their support facilities in the Caribbean and Asia. In addition to RCD's facilities, GCG has seven other manufacturing and design facilities located within the United States.

SUPERCAPACITOR

CAP-XX GETS MURATA'S SUPERCAPACITOR LINES



Supercapacitors leader CAP-XX announced it will acquire CAP-XX licensee Murata's supercapacitor production lines, relocate them from Japan to a new factory in Sydney, Australia. The firm intends to begin producing Murata's three supercapacitor product families in Q3 2020, while Murata will also assist in introducing CAP-XX to its customers.

Murata licensed CAP-XX's patents in 2008, began production of supercapacitors in Japan in 2013, and has since significantly built its supercapacitor business. After a strategic review of its business in 2018, Murata informed CAP-XX that it wanted to focus on its multilayer ceramic capacitors and lithium batteries, and exit some of its non-core business lines including supercapacitors. Consequently, the two companies reached agreement for CAP-XX to acquire Murata's high-quality production lines. **EP**&**T**

AD INDEX

Absopulse Electronics Ltd
Advanced Interconnections
Allied Electronics & AutomationOBC
BEA Lasers 29
Blockmaster 29
Coilcraft
DFI Inc
Digi-Key CorporationOFC, IFC
Electronic Products & Technology 22
Electrosource 2020 28
EPTECH 2020 24-25
Hammond Mfg CoIBC

EMI Filter for 1-phase 277 VAC / 400 VDC Applications

SCHURTER'S FMAB HV EMI filter rated up to 277 VAC is ideal for 1-phase of the 3-phase 480/277 VAC Wye system used for lighting and

other mains connected applications. It is also rated 400 VDC for power infrastructures common in data centers. cURus and ENEC approved. Temperature range is from -40 °C to 100 °C.







IP65 RoHS High Audio / Lighted Output! Listen to Our Product Selection Online! (847) 956-1920

www.TUSAINC.com





847-956-1680

Interpower Corporation
Master Bond Inc
Newark element 14 Electronics 5
Phoenix Contact Ltd 19
Protocase
Schleuniger, Inc
Schurter Inc
Transducers USA

TO ADVERTISE contact **Scott Atkinson**, Publisher, satkinson@ept.ca or (416) 510-5207, **Jason Bauer**, Media Sales Manager, jbauer@ept.ca or (416)510-6797 or **Joanna Malivoire**, Account Manager, jmalivoire@ept.ca or direct 866-868-7089.



Made Your Way & Made in the U.S.A.

Interpower® manufactures quality cords for global markets. These cords are available in various colors and lengths and can be made to your specifications.

- No minimum order or dollar requirements
- Blanket and scheduled
 orders available





POWER SUPPLIES Rugged, Industrial

Cost-effective solutions to tough design challenges from a few watts to multi-kilowatts



BEA Lasers New Quartz Window E²L Alignment Laser for Extreme Environments!

Visit our website, request a catalog, or give us a phone call for additional information



VIEWPOINT

Women in Electronics

Exploring diversity through women in the Canadian electronics engineering and industry profession





Naudia Banton is the Director of Operations for intelliFLEX Innovation Alliance. She is a woman of colour, a mother, a

wife, a daughter, holds a Master of Science in Technology Management and runs her own consulting company. She has a passion for helping women in tech and entrepreneurship and helping young workers navigate their first jobs.

How has your role or career path evolved over the years?

I spent the first 15 plus years of my career working in Human Resources. During that time, I worked in multiple industries including publishing, healthcare, insurance, education, and manufacturing. In each of my various roles I tended to gravitate towards innovation and process improvement. Then I got the opportunity to work in the Startup space, helping companies across industries and applications; that's where all my generalist experience came alive.

Now I manage an industry alliance that focuses on printed electronics, which I would not have been exposed to, had I not had worked as a Startup advisor.

Throughout 2020 EP&T explores the topic of diversity in the industry through a series of articles; stories designed to get readers thinking about gender equity in the engineering profession, allowing others to perhaps see their surroundings through a new lens.

What are your most compelling accomplishments?

There are probably three that stand out the most.

In 2014, I was hired by Communitech, one of the largest innovation hubs in the world, to build a boot camp that supported women entrepreneurs engaged in technology development and commercialization. We had over 100 applications and selected 25 women to go through a 6-day intensive boot camp in order to compete for \$100,000 in seed funding. That Women Entrepreneurs boot camp launched the first female focused accelerator in Canada – Fierce Founders.

I have also consulted with Deloitte and the World Bank to develop another female entrepreneur boot camp and programming for entrepreneurs in the Caribbean.

In 2018, with the support of my family and while working full-time, I completed the Master of Science in Technology Management program at the Lazaridis Institute at Laurier University.

What key words of advice do you have for employers seeking to create a supportive environment for women? The one that stands out

the most to me is having a flexible work schedule. Working 8-4, is no different than working 10-6; they are still 8-hour shifts.

When you treat people as adults and allow them to go to drop their kids off, go to doctors' appointments or care for aging parents, and then allow them to make the time up, it helps them manage and balance their lives. Historically these things have been seen as the responsibility of the woman, but if the culture supported a flexible work schedule for men and women, women would no longer be singled out. What impact does the lack of female role models in higher level positions have on aspiring engineers or young women entering the field?



I think people under estimate the impact of role modeling and mentorship in the workplace. When women, and I think people

in general, see themselves reflected in leadership positions, it breeds a certain sense of belonging and normalcy.

I have so much admiration for women who are trail blazers in their fields. I believe it's vital for women to see other women in leadership positions to be inspired and motivated by their successes. It is especially important for women who are just entering the workforce to have someone to look up to and to aspire to emulate.

What does diversity mean to you and why is it important [for engineering]?

That is an interesting question. I am a woman of colour, a mother, a wife, and a daughter, and unapologetic about it all. All of these things inform how I do business. That's not to say it's better than any other way, it's just different; and that diversity of thought is important.

In terms of engineering, there are more women than men in Canada yet women make up significantly less than half of all engineers in the country. There is a strong demand in the market for engineers so If we want to overcome skills shortages, then it's important that we bring the best minds to the table.

Canada is often referred to as a mosaic where the diverse make up of its population creates the rich tapestry of who we are. I will always be an advocate for diversity and inclusion. Not only it is the right thing to do, but different experiences and viewpoints are needed to make for richer and more prosperous economy. **EP**&**T**





14

THE LARGEST SELECTION OF RACK MOUNT ACCESSORIES

ALALASIA

Hammond has over 20 million dollars of in-stock inventory and over 16,000 unique product skus to choose from.

See the full list of accessories at www.hammondmfg.com



We stock enough power to brew a 12 oz. cup of coffee for the entire population of New Orleans.

Put that in your mug and drink it.