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MAY 2020

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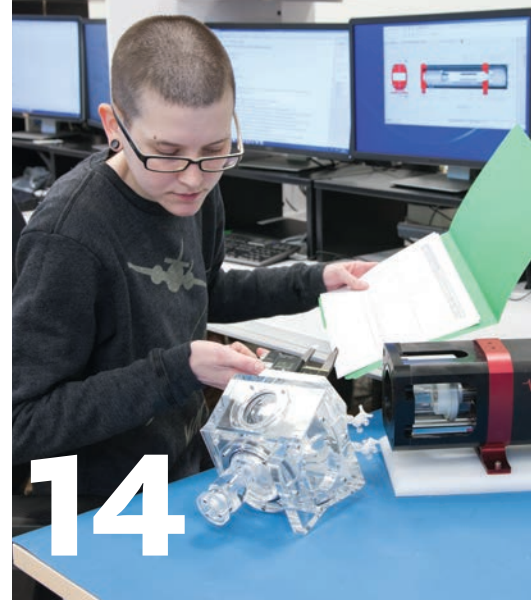
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COVID-19 infects electronics industry

Global Pandemic has bright side through collaboration



What a crazy ride it has been – these past few months. While COVID-19 has its pandemic grip on the earth's popu-

lace, a global lockdown has forced businesses within the electronics industry to pivot and adapt to many the ups and downs.

For the makers of widely used core tech items such as smartphones, TVs and laptops, evidence shows that changes in consumer spending habits are taking their toll. Unemployment and downward pressure on consumer spending has delivered significant headwinds to the tech industry outlook. Several global electronic OEMs have been impacted negatively, including Apple, Canon, GoPro, Hitachi, Huawei, LG Electronics, Nikon, Panasonic, Samsung, Toshiba, and many others.

SUPPLY CHAIN

We continue to see increased supply chain disruption, in three primary ways: limited access to employees due to quarantines, factory closures or manufacturing slowdowns and limited access to

research group GlobalData, the pandemic is expected to shrink worldwide end-user demand for everyday products powered by semis and ICs.

COLLABORATION

Overriding this theme of darkness has been the collaborative efforts demonstrated by a number of innovative and willing electronic makers, particularly in the medical design space. In the midst of the battle with COVID-19, Canada's Prime Minister announced a plan to pull together players who can escalate the production of ventilators for intensive care units at hospitals across the country.

Stepping up into action were Thornhill Medical Research in Toronto (see page 10 of this issue), CAE in Montreal, Starfish Medical in Victoria (see page 14 of this issue), and a consortium known as Ventilators for Canadians – with aim to build 30,000 ventilator devices used to keep critically ill patients alive.

Under normal circumstances, Thornhill Medical would produce at most 50 units in a month, but have managed to scale that by ten-times with help from Guelph ON-based manufacturer Linamar. Likewise, ventilators were not

'Winnipeg ventilator' – producing thousands of them within weeks. Even electronic component distributors, such as Digi-Key got into the act. The firm's engineers worked in partnership with the University of Minnesota to design and supply additional ventilators.

OPPORTUNITY

A spark of creativity and opportunity ignited amongst a handful of electronic industry veterans during lockdown. The trio of Jarred Knecht president of Pro-mark Electronics Inc., along with John Soares and Steve Zimmermann of CMP Advanced Mechanical Solutions united their companies' expertise and co-founded Social Distancer Technologies Inc. With support from the National Research Council of Canada Industrial Research Assistance Program (NRC IRAP), the freshly minted concern began making the Social Distancer, a wearable credit-card sized device designed to provide all types of workers with a means to easily maintain a safe two-meter distance between one another.

WHAT'S NEXT?

As with most things in life, it's what you make of a difficult situation. No doubt, there are major considerations to factor in how our industry emerges from the pandemic. The tech industry has weathered many economic storms over the last few decades, but as a whole, the electronics industry remains resilient and plays an indispensable role in our lives. The financial health of the consumer and their willingness to spend presents the biggest swing factor for the tech industry outlook.

Time will tell... **EP&T**

STEPHEN LAW

Editor

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Overriding this theme of darkness has been the collaborative efforts demonstrated by a number of innovative and willing electronic makers, particularly in medical design

logistics to move goods. Most supply chain organizations have been operating in crisis management, assessing impacts and response on a daily / hourly basis.

Semiconductors, the ubiquitous 'chip' that populates almost every printed circuit board, has suffered greatly as a component sector. According to industry

among the biggest focus for Starfish Medical. However, when the government-funded industrial 'supercluster' group NGEN approached, Starfish joined Winnipeg-based Cerebra Health, which created a ventilator prototype 20-years ago. Utilizing strengths, along with some updating, they managed to resuscitate the

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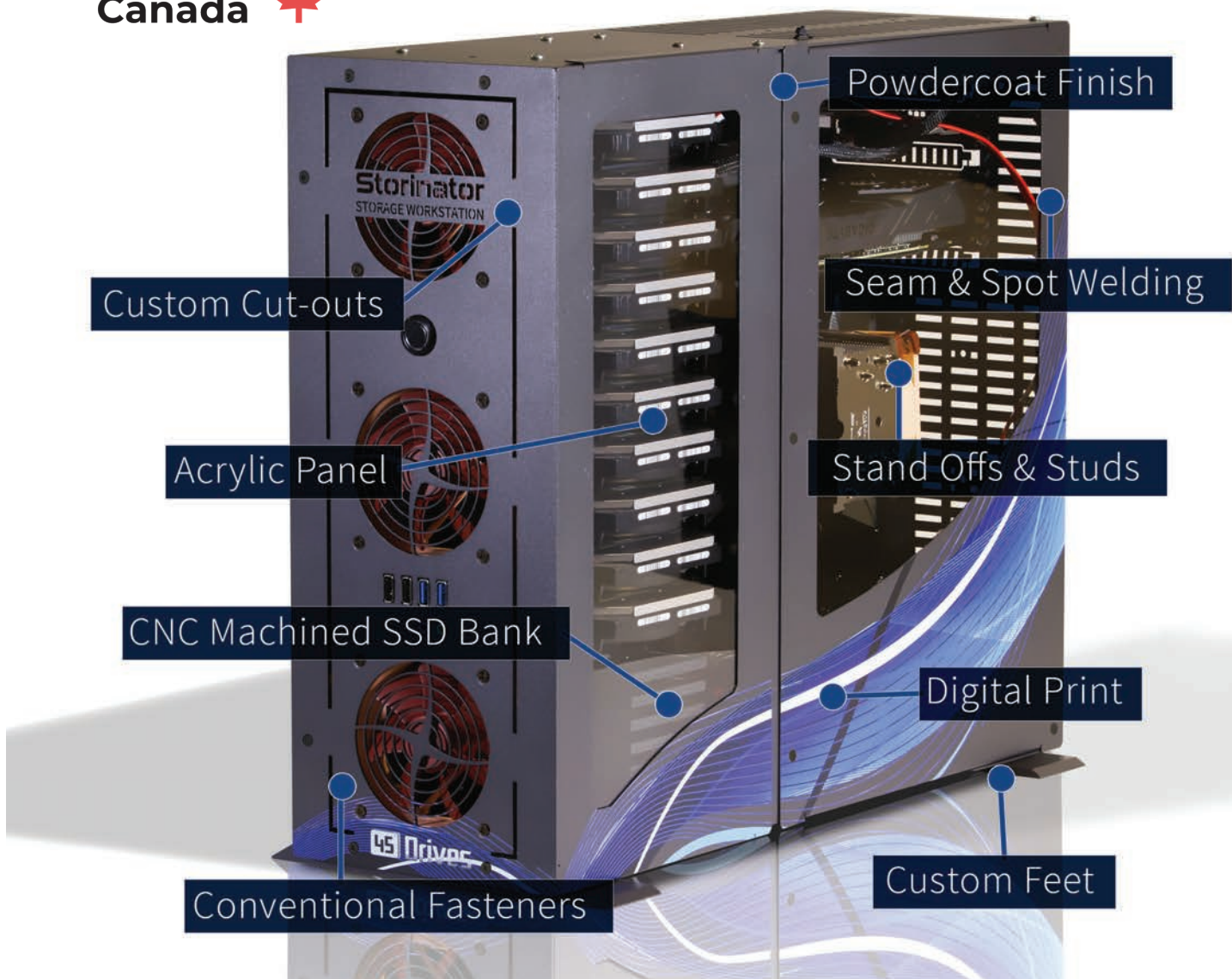
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COVID-19

THORNHILL AND STARFISH BUILD VENTILATORS

Thornhill and Starfish Medical to the rescue. These two key players on the Canadian medical electronics design landscape were recently asked by the federal government to quickly produce medical equipment to cope with the rapidly multiplying cases of COVID-19 across Canada. In March Canadian Prime Minister Justin Trudeau announced a plan that was to provide support to manufacturers that want to retool their assembly lines to make ventilators, masks and other personal protective gear.

Thornhill Medical in Toronto, Starfish Medical in Victoria, CAE in Montreal, and a consortium known as Ventilators for Canadians have joined the federal government's drive to add as many as 30,000 ventilators to Canadian intensive care units during the pandemic.

Both Thornhill and Starfish say they received lots of calls from people all over the world wanting help to fight COVID-19, but both are focused on Canada's needs first. You can read more in-depth coverage about Thornhill Medical on pages 10-13 and StarFish Medical on pages 14-15 of this issue of EP&T.

COVID-19 HAS STUNTED CHIP DEMAND

During the first three months of 2020, the backdrop for the semiconductor sector has changed, but long-term issues remain and must be solved, says GlobalData, a leading data and analytics company.

"The COVID-19 pandemic will shrink worldwide end-user demand for everyday products powered by semiconductors," says David Bicknell, principal analyst, thematic research at GlobalData. "COVID-19's impact also means much of the industry is only operating at about 50% capacity, though China is moving again. At the same time, the global supply chain has stalled, exacerbated by COVID-19-related border checks that could last for months."

The good news is that, on the supply side, the manufacturing operations of China-based dynamic random access memory (DRAM) and flash memory plants have been largely unaffected, as highly automated semiconductor fabrication plants need little manpower. COVID-19 has triggered surging demand among millions



The electronics industry has not been unscathed through the global COVID-19 pandemic.

of people worldwide for online services and apps but, so far, there has been little disturbance to the supply of extra servers for China's data centers.

"The captive semiconductor operations of Apple, Huawei, Google, Amazon, and Alibaba, remains long-term, up to five years ahead, and designers can use cloud-based services," Bicknell concludes. "By then, China's currently weak semiconductor industry will have grown to become a challenging competitor for the US."

CALGARY TECH TEAMS WITH ACADEMIA

A joint effort between a medical technology developer, a health sciences software firm and a leading medical college are in the early stages of combining their strengths to create a device that can test for COVID-19. Calgary-based FluroTech Ltd. has entered into a strategic agreement in principle with Alberta BioPhotonics Inc., Calgary, and Albany Medical College in Albany NY, to form FluroTest LLC.

FluroTech's CompleTest adaptation is expected to take approximately three months with trials planned shortly thereafter. The coalition cautions that FluroTest is taking its existing technology and adapting it to test for COVID-19. The group remains in the early stages of R&D and are not making any express or implied claims that it can accurately diagnose COVID-19 virus at this time. FluroTech and ABP are majority shareholders in FluroTest.



R&D

Efforts between a medical technology developer, a health sciences software firm and a medical college are collaborating on creating a device that tests for COVID-19

AIRWAVE DEVICE TO SCREEN FOR COVID-19

Calgary area-based Airwave Electronics/Environmental, a long-time innovator in chemical gas sensing technologies, is developing a device to detect the COVID-19 virus immediately and at safe social distancing. Technology that has long been used throughout the world to detect gas leaks and monitor pollution levels is now being developed to screen for public health.

The device leverages the same concept that enables dogs to reliably sniff out gases associated with cancer and other diseases. It uses infrared technology (FTIR) to scan for the unique emission spectrum of people carrying the COVID-19 virus. Results are immediate, without intrusive testing or personal contact.

The device is small enough and light enough to be transported by a single operator. Its versatility enables it to be mounted on a portable stand, such as a tripod, or permanently secured to static structures, enabling a multitude of applications for its use, including area surveillance.



Airwave Electronics, makers of a hydrogen flame emission detector (above) are also working on a device that detects COVID-19 virus immediately.

Photos: Getty Images; Airwave Electronics; Synaptive Medical

U OF WATERLOO FUND AIDS HEALTH TECH START-UPS

The University of Waterloo has launched a second venture capital fund targeted at early-stage startups involved in health technology.

The Velocity HealthTech Fund will give early-stage health startups a chance to access \$50,000 in pre-seed funding to grow their business and would be awarded following a pitch competition.

The HealthTech Fund will make investments in addition to the \$50,000 that pitch competition winners gain from the current Velocity Fund. The current fund was launched last year and has raised US \$1.3-million and has invested \$600,000 into 12 startups.

"We launched the second fund in part to meet a market demand among investors that we know exists and to address the ongoing challenge that early-stage companies face in attracting investment," says Adrien Côté, executive director of Waterloo's entrepreneurship program, Velocity.

CANCELLED ELECTRONIC INDUSTRY EVENTS

Given the global impact COVID-19 has had on trade-related conferences and trade shows, it's no surprise that a number of electronic industry events in Canada have been cancelled, postponed or to be held remotely.

Among the affected events include EP&T's own **EPTECH trade shows**.

Mississauga (New Date)
August 26th, 2020
Montreal/Pointe-Claire (New Date)
September 29, 2020
Vancouver
(New Date TBA)
Calgary
(New Date & Venue TBA)

MEDICAL

SYNAPTIVE MEDICAL GAINS APPROVAL FOR EVRY

Synaptive Medical, a Toronto-based leader in robotic surgical visualization, has secured approval from Health Canada for Evry, the company's superconducting, head MRI.

Evry has been designed to provide imaging directly at the point of care in areas outside of diagnostic imaging departments, which was previously unachievable due to the size of con-



Synaptive Medical received Health Canada approval for Evry, a superconducting head MRI device used in hospitals.

ventional MRIs.

To overcome the challenges associated with MRI innovation, including accessibility in critical and acute cases like brain tumor and ischemic stroke, Synaptive developed Evry as a means for healthcare professionals to make accurate cranial diagnoses in time-sensitive cases.

Among Evry's features include a mid-field 0.5T superconducting magnet that reduces the system's physical footprint, as well as predefined imaging protocols, automated series planning

including volume selection, a detachable stretcher to support bedside transfers and a multichannel head coil with patient-specific customized fitting intended to optimize image quality.

Evry also bypasses the need for rigging and cranes for the delivery of MRI, yearly cryogen refills, a cryogen pipe and reinforced flooring, thus providing significant cost advantages.

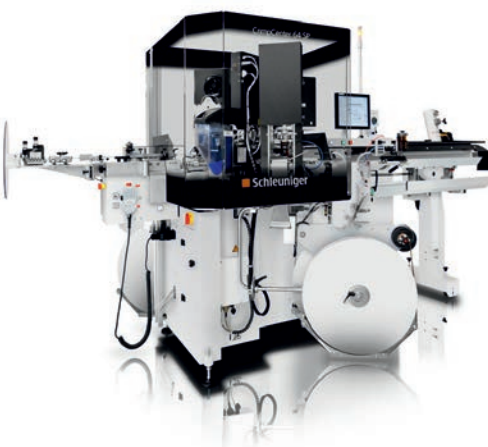
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Calling all engineering superheroes in a brave new world

MistyWest sets goal to create intelligent, connected devices

BY SOHAIL KAMAL, WEST COAST CORRESPONDENT



The COVID-19 pandemic and its effect on markets and commercial activity will present challenges to everyone. From an individual standpoint, consumption and work routines have changed. The challenges could deepen depending on the severity and length of the crisis, and the uncertainty will make it hard to anticipate how a recovery could unfold.

Many companies have pivoted to help out: Bauer is making medical devices and Tesla is developing ventilators, to name a few high profile examples. More than ever, we have pitted our hopes on our engineers and scientists - this time, to solve a viral

“More companies are looking to us to sort out what a company should be, how we succeed in operating so differently. In the hardware community we like to help guide the careers of many engineers,” says Christie.

calamity that has led to the death of hundreds of thousands of people worldwide, and counting.

Enter MistyWest. I recently had the opportunity to reach out to Leigh Christie, co-founder, engineer, and community builder of MistyWest, one of Western Canada’s highly regarded contract engineering and design firms. They have worked on several high-profile product development projects with a humanitarian slant, and the team has grown from a start-up just over a decade ago to over 25 full-time equivalent employees in 2020.

Their goals as an organization are lofty. Their mandate is to create intelligent and connected devices that have positive impacts on the health and prosperity of all. By targeting



Leigh Christie, co-founder, engineer and community builder of MistyWest

projects that support the UN’s Sustainable Development Goals (SDGs), MistyWest stands out.

“We’ve grown a lot because of our incredible engineering talent, and our unique work culture. Plus our specialization [in connected and intelligent devices] has been an incredible growth industry,” says Christie. The firm’s work is usually commissioned by large organizations, such as Microsoft, Google, LuluLemon, and Intel, but they also work with start-up companies.

Ambitious vision

One of the challenges with having an ambitious vision is that it requires finding other ambitious companies, of adequate size, to work with and work for. In this way, being in Vancouver has been both a blessing and a curse.

“The talent pool [in Vancouver] is deep, but there are not enough Fortune500 companies in Vancouver who need our help. But we are always looking for companies who think big and want to change the world for the better,” explains Christie. “More specifically, we are really picky about the

projects we work on. We choose projects that require a multi-disciplinary team, who are working on exciting new technologies.”

Misty West’s unique culture and success may explain why companies often sought them out for strategies in hiring and culture.

“More companies are looking to us to sort out what a company should be, how we succeed in operating so differently. In the hardware community we like to help guide the careers of many engineers,” says Christie.

Robotic Overlords event

MistyWest often helps to bring top engineering minds together through hosting speaking engagements, but social distancing has forced MistyWest to postpone their most recent engagement. Their Robotics Overlords event, which has been postponed until June, will feature machine learning and artificial intelligence, and is at the core of MistyWest’s outreach.

“It’s how we make friends, build the community, recruit, and find new clients,” Christie adds.

Futuristic technologies

In the meantime, MistyWest is working on the third UN SDG of Health and Wellbeing, partnering with Ocalink Tech to help manufacture one-million ventilators in 90-days. That is one fantastic goal. MistyWest’s website explains that

“We are passionate about creating futuristic technologies that enable a healthier planet and bring prosperity to all humankind.” Perhaps lofty, but our world is especially in need of superheroes this year.

Christie has created an open-source COVID-19 Medical Supplies group (#OSCMSBC) for anyone in BC engineering, manufacturing, government, or medicine to collaborate on solutions. To learn more about MistyWest, go to www.mistywest.com.



Sohail Kamal is EP&T’s West Coast correspondent. sohail@nextgear.ca



MistyWest has grown from a start-up 10-years ago to employing more than 25 full-time today



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Thornhill Medical to the rescue

Electronic design firm led by medical experts takes the road less traveled.

BY STEPHEN LAW, EDITOR EP&T

➔ When it comes to designing new electronic devices, Dr. Joe Fisher seems to have come up with the ideal formula—let the end-users create the products. In this particular case, Fisher, an MD with experience in emergency and critical care medicine plus anesthesiology, painstakingly assembled a diverse team of researchers, innovators, scientists, engineers, product specialists and entrepreneurs to create Thornhill Medical Research Inc.

Spun off from the University Health Network in Toronto in 2003, Thornhill Medical has gone on to develop innovative medical technology that is changing the global face of emergency medicine for first responders and the military. In a relatively short time, the company was able to create medical care devices not previously thought feasible, or even possible.

“If you keep following the same road, you will always arrive at the same destination,” mused Fisher. “So if the company had stuck to high-powered, well known, smart, high achieving scientists, they would have gone down the road well-travelled and ended up making the same products everyone else makes.”

One aspect of product creation that certainly sets Thornhill apart from most other design houses is that the firm only takes on challenges that represent new products—not another version of an existing product—just totally new conceptual entities. Each of its major products: the life support system, MOVES SLC, digital anesthetic vaporizer MADM, treatment of CO poisoning ClearMate, and the blood gas controller RespirAct, are the only ones of their kind.

Fisher points to another key factor in the mix—he was not a high achieving, classically trained PhD scientist—rather a total scientific outsider.

“But, if I was willing to pay for the ‘research’ myself...well, I could do what the hell I pleased. Indeed, the

(medical) journals didn’t know I was a nobody, so I was able to get the work peer reviewed and published,” he adds.

First designs

Fisher had to develop a strategy when approached by the military and emergency first responders seeking a device that could deliver fine control of blood gases and a related capability of highly efficient means of delivering inhaled gases. Both requests led to the development of the treatment of carbon monoxide poisoning—an emergency medicine device.

“The high efficiency of oxygen delivery aroused the interest of the USMC (United States Marine Corps.) that wanted to reduce the use of oxygen tanks in the field. At the time they needed these tanks to provide sufficient flow of oxygen to satisfy the requirements of a patient who was breathing hard,” Fisher says.

Thornhill delivered on a proof of concept which boosted oxygen levels without tanks. Then came what Fisher refers to as ‘feature creep’. Marines asked if we could put physiologic monitors such as ECG, blood pressure, and gas sensors, on our device; provide a monitor to display the values; add a ventilator, that could be run from the monitor; and add suction capability.

“Once we could do that, they asked if we could develop a small anesthetic delivery system suitable for the field. Each one of which, the nay sayers pointed out, was totally out of our expertise, off the focus of the company, overwhelmingly difficult, time consuming and expensive to do. No way we should do it,” Fisher explains. “But, to all of which we answered, ‘yes, of course.’ And, hence we had a company.”

The team

On his journey, Fisher has moved in lockstep with a medical brain trust comprised of Drs. Ludwik Fedorko, Steve Iscoe, Jim Duffin and a group of



Thornhill Medical created MADM, a portable inline direct injection gas anesthesia vaporizer, capable of delivering isoflurane (ISO) and sevoflurane (SEVO) gas anesthesia safely and accurately using any source of ventilation.

founding engineers that managed to commercialize many of their ideas and research. The P.Eng cluster is comprised of a diverse ecosystem that includes: Kevin and Brian Kowalchuck, electrical engineers; Kevin Ramkalewan, electrical engineering student; Drew Miller, electrical and software engineer; Cliff Ansel, engineering science; Veso Tijanic and Eduardo Mas-sionis, mechanical engineers; George Volgyesi, biomed engineer.

Conceptualizing

Fisher explains that the actual work of the company is conducted in a series of leaps of faith: into a new product, into new science, and new engineering, with the result not known until all the components are stretched and molded this way and that in an attempt to get to a practical working product.

“Having made the damn thing, the next challenge is to get buy in - convincing people that the new device works better than what they are using and worth the trouble of changing,” says Fisher. “Fortunately, for our first set of products it has been inevitably true that it is better than their current

Photo: Thornhill Medical Research



Used by multiple international armed forces for casualty care during transport, MOVES SLC is an integrated Intensive Care Unit (ICU). The device combines an O₂ concentrator, O₂ conserving ventilator, suction and complete vital signs monitor.

practice. But, we find great reluctance in people to nevertheless abandon their practiced approach.”

Collaboration

Collaboration through the engineering process is essential, according to Fisher, as the design team is multidisciplinary and requires high level of coordination. He adds that

collaboration between different engineering disciplines is the challenging process that requires the team members to step outside their traditional focus area in order to bridge the gap between the disciplines.

Even more challenging is the collaboration between the Medical Science and Physiology team and Engineering Teams. The physiological parameters

need to be understood and transferred to the engineering terms. The physiology systems need to be modeled using electromechanical principles and later designed and built in the physical device. This process requires the engineers with the medical science background and ability to constantly learn and develop.

The next level of collaboration is achieved through the project management where the activities are synchronized between the groups and individual contributors.

Home made

When it comes to actually creating these medical devices, Thornhill develops and designs its products at the Toronto office. Initially, the firm operated as a design and development firm. It then developed its own internal resources to primarily handle the new product development.

To be effective, Fisher realized that the company needed to invest in prototyping techniques. Thus, the firm purchased two Fused Deposition Modeling (FDM) machines 14-years-ago when the technology was still new.

This, combined with the prototyping shop that had two CNC machines and other prototyping equipment, helped Thornhill effectively produce prototypes and accelerate design process.

“In parallel we built the prototyping team that was the core force for the future development of our manufacturing team,” Fisher says. “We looked at contract manufacturing options, but realized that due to the product specifics - we were better off developing our manufacturing capabilities.”

Fisher says his team works closely with its component suppliers and performs final assembly and end-testing in house at the Toronto facility.

“Our manufacturing capabilities will strengthen with our recent move to the new (Markham ON) office, which is better suited for manufacturing and material flow.”

Making medical

The complexities of creating a certified medical device, versus that of creating a simple wearable consumer device are amplified by the human interface and the life dependence to the medical product, according to Fisher.

“The margin of error and risk of failure make the medical device highly challenging,” says Fisher. “Making the Life Support System creates a level of responsibility that is not necessarily present with some other devices.”



Dr. Joe Fisher is founder and CEO of Toronto-based Thornhill Medical Research Inc.



Thornhill Medical Research has created several widely used devices within medical circles, including ClearMate - a portable and patented device that lets doctors treat carbon monoxide (CO) victims as effectively as hyperbaric oxygen.

Fisher points out that the medical device environment is highly regulated. The facilities and processes are held by the higher standards and constantly evaluated. The regulations are constantly evolving – ensuring that the products keep up to date with the new standards.

The product risk evaluation is very rigorous and present at any step of the product life.

“That is what makes it unique in comparison to the other products,” he says.

Fisher lists off some of the biggest hurdles or challenges in having a medical device certified.

- Strict and rigid regulations
- High cost of certification process
- Constantly changing requirements
- Bureaucratic approach

Working on multiple complex

medical devices simultaneously turns out to be the biggest challenge for a relatively small company like Thornhill Medical.

“It is our biggest operational challenge,” he says. “Since we cannot afford to have dedicated team for a single product, we need to have people that are ‘light on their feet’ - able to quickly move to the new challenge. We are working on the long-term scheduling, prioritizing and we communicate the expectations in order to effectively manage multiple products.”

Acute designations

Bursting with pride over the work they have achieved thus far, Fisher proudly states that Thornhill Medical will become the world standard for life support systems, in addition to becoming the source of the world-wide accessible treatment for carbon monoxide poisoning. Fisher asserts his group will also be a key component to the gold standard for the use of MRI for the prediction of stroke and heart attacks, and tumor virulence.



The MOVES SLC device is designed to support en-route care patient transport missions, as well as providing stationary life support capability.

Fisher shares what he feels are three of his firm’s biggest accomplishments over the years. Without any doubt, first on his list was Thornhill Medical’s capability of taking three disruptive products from whiteboard drawings, through prototypes, products, regulatory approval, manufacturing and distribution to service in the field of the world’s most advanced and discriminating customers.

“Second, has been the development of scientific and engineering breakthroughs that will spawn and support whole new fields of scientific discovery and technological wizardry,” Fisher says. “Third, is survival and accomplishments for 15 years with our own devices—bootstrapped with ‘friends-and-family’ support only.”

Moving Forward

Fisher stressed the importance of Thornhill’s engineering team to continue inspiring innovation – whether it is developing a new device or redeveloping or re-designing an existing product.

“Our engineers are not only the actors on the stage, but they have been here long enough to have conceived of the play, written the dialog and music and helped stage the production,” Fisher says. “This gives them, and the rest of the company, great depth in continuing to innovate and improve our unique products. The older, grayer the head, the more we cherish it.” **EP&T**



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MedTech firm reaches for the stars

StarFish Medical specializes in designing medical and life science devices

BY STEPHEN LAW, EDITOR EP&T

➔ Referring to his firm as a “pre-eminent” medical-device design company in Canada, founder and CEO of Starfish Medical Scott Phillips has reason to be proud and assured. Based in Victoria, BC and an office in Toronto, StarFish has grown under his leadership into a diverse professional organization with clients around the world and 100% focus on medical devices.

Supporting his firm’s credibility within medical circles is the number of industry awards and recognition it has received. Some accolades include: The *Globe and Mail*’s ranking of Canada’s Top Growing Companies in 2019; and *Growth 500* ranking for the second consecutive year, *BC Export Leadership Award*, Strategic Life Sciences Partner of the Year in 2018. In 2017 Phillips captured the *EY Entrepreneur* of the Year and was a Pacific Awards Technology Category Winner, while landing a Medical Design Excellence (MDEA) Award.

For the past 20-years StarFish Medical has operated as a full service medical device design CEM offering turn-key design, development, and manufacturing services. The firm uses its Pathfinder process to reduce wasted effort and increase success for medical device product definition, technical engineering, and product development. Prototype and volume production are delivered within an ISO 13485 certified Quality Management System and an FDA registered manufacturing and clean room facility.

EP&T posed a number of questions to Phillips, who holds a degree in engineering physics from UBC. Prior to starting StarFish, he worked in diverse areas such as lithium battery development and manufacturing, UV spectroscopy instrumentation and hi-fi audio speakers.



Q

How did you create StarFish?

I formed StarFish Medical in Victoria in 1999 as an outgrowth of my own contracting activities. I was 10 years into my career at the time as an engineering physics grad from the University of BC. Now we employ 140 people, mostly in Victoria and Toronto. We serve the North American market and are one of the leading companies in our space. StarFish focuses 100% on medical devices and life sciences products - primarily complex electromechanical design, engineering and manufacturing services. We also have expertise in optics, cell therapies, and microfluidic assays.

Detail the Pathfinder process, used to reduce wasted effort and increase success for medical device product definition, technical engineering, and product development.

Pathfinder is our framework for product definition. We really try to engineer an optimal business outcome

StarFish Medical has operated as a full service medical device designer & CEM in Victoria & Toronto for 20-years.

for our clients. We make sure we’re properly addressing issues including usability, regulatory compliance, target margins, consumables strategy, clinical strategy, IP, reimbursement and service strategy. The investigation is framed into formalized design gates to be as efficient as possible at designing and engineering the right product.

What challenges are medical designers faced with, that other consumer-based electronic design houses never have to.

Medical electronic designers have a lot of interesting regulatory issues to deal with from government bodies like Health Canada, FDA, and EU. For example, meeting industry specific standards such as ISO13485, IEC60601 (safety of electronic medical devices), IEC62304 (software for medical devices), ISO 14971 (risk management for medical devices), ISO62366 (usability for medical devices). Formative and summative human factors studies are required. Change

StarFish designs (from left) iMotion Neuro MRI machine; IOPac portable ophthalmic device; Aurora DNA sample preparation unit.



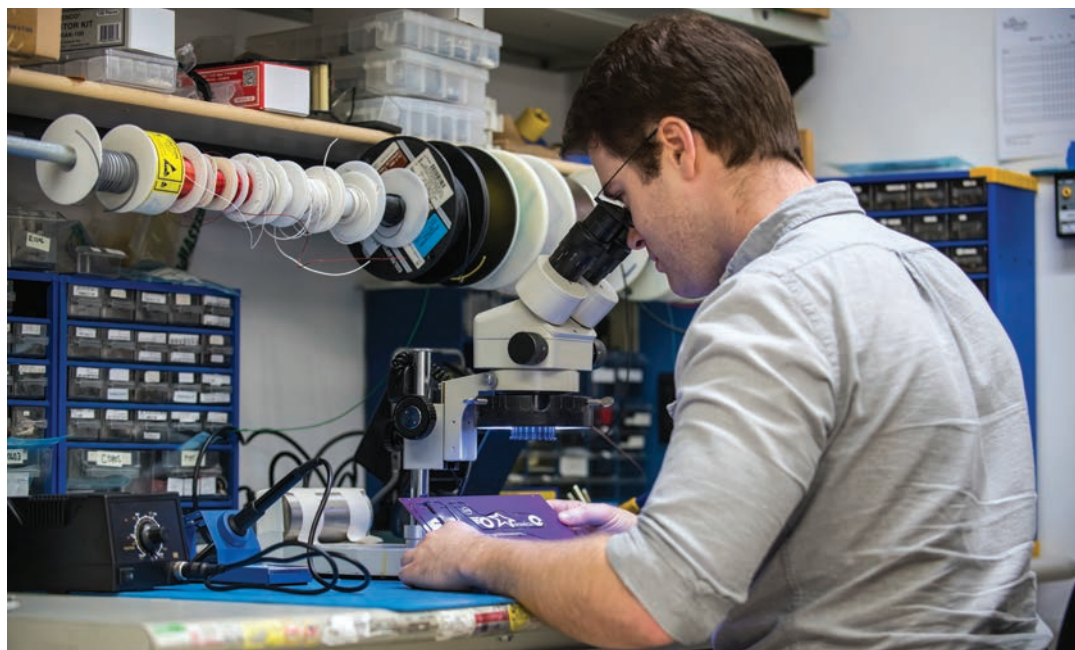
Photo: StarFish Medical

control is a big deal. Often changes have regulatory implications that require careful attention. The Design History File of a device must include updates to the risk analysis as changes occur and field data comes back. The lifetime of a medical device can be a decade, so we have to plan on how to support devices in the face of component obsolescence.

What was StarFish's initial focus or area of expertise within the medical electronics design sphere. How does that compare to what it does today?

A 21 years ago we started in ophthalmic instrumentation. Our first large program in medical was an ophthalmic ultrasound system. Today, StarFish assisted patents span over 150 cardiovascular, digital health, IVD, ophthalmology, optics, and ultrasound medical devices. Examples include 3D ultrasound from inside the beating heart, spinal surgery for ALS

StarFish Medical founder & CEO Scott Phillips (below) holds a degree in engineering physics from UBC. Most StarFish staff are working remotely through the pandemic, while a handful come in to test benchtop prototypes (bottom).



patients, and platelet analysis using lasers for safer transfusions.

Outline your involvement with the Next Generation Manufacturing Supercluster, in helping to design a ventilator model.

We were contacted in late March by NGen (the Next Generation Manufacturing Supercluster). They connected us with Cerebra Health, a group headed by Dr. Magdy Younes in Winnipeg that had old clinical prototypes and wanted to adapt them to the current circumstances. Dr. Younes is one of the world's leading ventilator innovators. In very short order we created a collaboration and started working on the design. Within a week we were able to deploy over 25 engineers and designers onto the program. NGen provided initial funding through their COVID-19 program, and the Federal Government placed a large order. It's an honour to have the opportunity to step up at this critical time.

We're currently in the design cycle with supply chain integration happening in parallel. Early production is expected in May. Clinical and regulatory discussions are also occurring at the same time. You can imagine the range of challenges we're working through.

How many units will be produced? Where will they be distributed?

As announced by Prime Minister Trudeau, the government intends to buy 30,000 made in Canada ventilators produced by four groups. The Winnipeg Ventilator is one of the four. Our supply chain group is finalizing

the CM partners shortly. With an even division of production, we'll be responsible for 7500. But that may go up or down depending on the other parties and the evolving need.

How is StarFish dealing with the restrictive capacity within supply chains during the COVID era?

Our supply chain group is working extra hard. We have been successful with securing parts for the other products in our plant and are working to obtain the right parts for our ventilators. Luckily we can draw on the supply chain capacity and influence of other larger partners as well.

Has StarFish experienced other challenges amid the disruption caused by this pandemic?

It's too early to tell. It's certainly harder to visit our clients. Clinical testing is largely on hold for the moment as well. In the short term we've seen more emphasis on programs that are somehow aligned with Covid-19.

Is most of your staff working remotely during the COVID-19 lockdown? If so, how is the team remaining connected?

Most of our engineering and design staff is working from home, with only a few people coming into the office to test benchtop prototypes and the like. Collaboration is happening mostly online with video tools and other document sharing platforms. We've added more communication tools and scheduled huddles to replace ad-hoc conversations. Most deadlines are being met, however, some supply chain bottlenecks beyond our control are affecting shipments a little.

Clearly StarFish specializes in complex design prototyping. How do you handle production runs? Do you use a local CEM?

We are a contract product developer. Often we have a big impact on the requirements development and strategic market fit of the products we develop as well. As such we often create a variety of prototypes for different purposes. Our manufacturing team focuses on NPI and clinical needs as well low volume, complex medical devices. We outsource electronics assembly and have a range of different CEMs we use for different volume requirements. Some CEMs are as far away as China, and others within a few blocks as we balance speed and cost. **EP&T**



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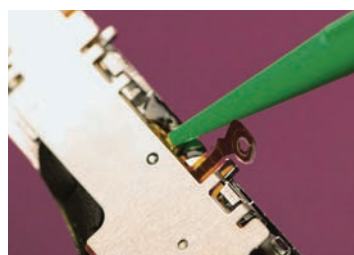
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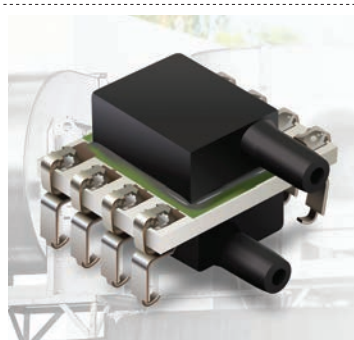
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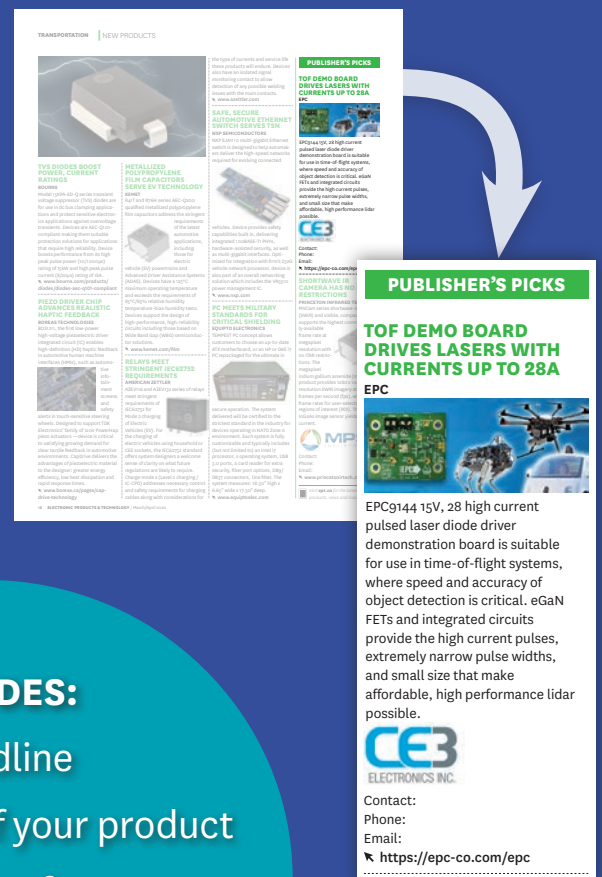
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Keeping medical devices safe from Cyber attacks

Securing hardware devices, services and data needs to start on the assembly line

BY ALAN GRAU, VP OF IOT/EMBEDDED SOLUTIONS, SECTIGO

 In the last few years, hospitals and medical facilities have been successfully targeted by cyber crooks looking to exploit or wreak havoc on the healthcare sector and its patients. Emboldened by the industry's slow progress in adopting technologies that harden medical devices and data systems, criminals have upped their game.

In the US, healthcare IT pundits have reported, at least six health care providers have been victimized by ransomware attacks last year. In June 2019, NEO Urology was attacked and ended up paying \$75,000 to regain access to their system and data. In February 2019, a ransomware attack on the South-eastern Council on Alcoholism and Drug Dependence resulted

and used for nefarious purposes. According to CBS News and Protenus, in 2018, 222 medical companies reported hacking incidents, affecting more than 11 million patient records. HIPPA compliance becomes the least of a patient's privacy worries when their medical records and credit card data are being sold on the dark web.

Outsmart cybercriminals

The cost of inaction, starting with something as obvious as email security, can be steep for healthcare organizations. It's also becoming more critical to outsmart cybercriminals by protecting connected medical equipment. For example, according to industry reports, the FDA said that several Medtronic's insulin glucose pumps (now recalled) could have been remotely taken over and induced to mis-perform, leading to dangerous healthcare consequences. Hardening these devices needs to start on the assembly line, and continue throughout the supply chain, from the processors and components inside the devices, to the software updated over the air.

Cybersecurity risks extend to patient safety as well. For example, if an iWatch or similar personal health monitoring device falsely indicates that a person's heartbeat is too slow or too fast, the worst that can happen is that the patient may get needlessly worried. However, if a pacemaker gets hijacked, it is possible to either speed up or slow down



Medical devices need to be protected against cyberattack, from original manufacturer assembly lines to updates in the field.

readings of the electrical pulses regulating the heart, impacting the behavior of the pacemaker. In the case of a glucose monitor used for diabetic patients, a false indication of blood sugar levels, combined with the incorrect 'automatic' dosage of insulin, could become deadly.

Immunize against attacks

We are living in a dynamic Internet of Things world where every 'thing' has some form of connected computer. By building security controls and policies into every device, medical manufacturers can not only prevent attacks that originate over the Internet, but also ensure that their equipment is not carrying a hidden malware payload injected during the manufacturing process.

To start: better knowledge and practices for website, network and database security using digital certificates and online security policies can ensure that medical organizations that use

the internet to transfer and store information, conduct online transactions, and provide personal data, are secure from most common hacking attempts. By ensuring that every website, server, mobile device, application, and piece of equipment has a digital identity that is authenticated (enabling encrypted communications), companies greatly deter hackers. Keeping hackers out of the IT networks reduces risk of attacks against medical devices and other systems inside the network.

Advancements in email security, such as using Secure/Multi-purpose Internet Mail Extensions (S/MIME) certificates to secure email communication, provide protection against phishing attacks and BEC attacks—safeguarding from having employees inadvertently open malicious emails from fraudsters. Securing emails closes one more door to hackers, who would otherwise gain access to networks housing personal

By building security controls & policies into every device, medical OEMs can prevent attacks from multiple sources

in them having to notify 25,148 patients that their data was potentially breached. These are just the attacks that have been reported; experts assume that many other attacks have occurred but kept confidential.

Patient's personal medical data can also be accessed, sold



huge strides in preventing remote attacks from infecting their devices and networks with malware, or inviting ransomware attacks. By adopting these modern security solutions, the industry ensures that the sub-assemblies and components, sourced from all over the world, as well as the various processors, boards, sensors, etc., built into their medical systems, are also safe from hacking.

Keeping medical devices and information safe from cyberattack is not simple and will never be perfect. It's an ongoing battle. Cyber criminals are always improving their methods and developing new, clever attack vectors.

However, by staying up to

date with the latest cybersecurity trends and using smart security procedures and software, manufacturers, medical facilities—and their patients—can gain the best preventative immunization available. **EP&T**



Alan Grau, VP of IoT, Embedded Solutions, Sectigo, providers of purpose-built and automated PKI management solutions to secure websites, connected devices, applications and digital identities. Grau has 25-years of experience in telecommunications and the embedded software marketplace.

and financial data or cripple and hold systems ransom.

Equally important is building security into a device. This requires security features that protect the device from attack, protect the integrity of the device, and enable device identity. The good news is that manufacturers, suppliers, and developers in the sector are increasingly adopting best-practice technologies for connected device security, including:

- **Secure Boot** – Provides embedded software APIs that ensure software integrity from the initial 'power on' to application execution and enable developers to securely code sign boot loaders, microkernels, operating systems, application code, and data.

- **Device Identity Certificates** – Injecting digital certificates into devices during manufacturing, enabling devices to be authenticated when installed on a network and before being able to communicate with other devices in the system. This ensures devices cannot be spoofed and provides protection

from counterfeit devices being introduced into the network.

- **Embedded Firewall** – Works with Real Time Operating Systems (RTOS) and Linux to configure and enforce filtering rules, preventing communication with unauthorized devices and blocking malicious messages.

- **Secure Element Integration** – OEMs and medical device manufacturers should integrate a variety of Secure Elements, such as Trusted Platform Module (TPM) compliant secure elements to provide secure boot, PKI enrollment using key-pairs generated within the secure element, and device attestation.

- **Secure Remote Updates** – Validate firmware is authenticated and unmodified before permitting installation of firmware updates, ensuring components have not been modified and are authenticated modules from the original equipment manufacturer (OEM).

The medical device developers and manufacturers that have implemented these security protocols and technologies have made



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Engineers persevere pandemic via remote offices

This unprecedented time may change how tech approaches innovation **BY STEPHEN LAW, EDITOR, EP&T**



NTCNA engineer Jeremy Chambers created a wire harness lab in his home's basement during lockdown.

Like much of North America's workforce amid the COVID19 pandemic, many employees are fortunate enough to be able to work remotely from a home office. Those involved directly in the fields of engineering or design work would agree that doesn't make their job any easier, but it can have some creative benefits.

Just ask Bob Flotkoetter, director of technology planning & research at Nissan Technical Center North America (NTCNA), which supports design and

development of all Nissan and INFINITI vehicles sold in North and South America. His role spans research and advanced engineering in areas such as vehicle-to-vehicle / vehicle-to-infrastructure communication, autonomous vehicles, battery, fuel cell and advanced manufacturing.

All of his design team has been situated in remote home offices since March 16th, which can bring some challenges and opportunities. Situated on 55-acres of land in Farmington Hills MI, the NTCNA employs 1,200,

while 80% of staff are involved with research and development. With the facility residing so close to the Canadian border, many of the engineering team members are from Canada, according to Flotkoetter.

Deep work, reflection

"Many of our engineers have been afforded the time to go deep into hypothesizing different design options, unlike before, where a good portion of their day may have been spent commuting, etc," he says. "I know some of my team members have already come up with some ideas for intellectual property and patents that have just kinda bubbled up from this very interesting time that we are facing right now. They have been able to conduct really deep work and reflection on some analysis they might not have otherwise had



Nissan Technical Centre North America (NTCNA) - Farmington Hills, MI

the chance to do before."

Flotkoetter is trying to maintain a 'business as usual' process, following his mantra of "same mission - different approach."

One of Nissan's engineers involved directly with the design of wire harnesses builds for a prototype vehicle remained undeterred by the loss of his normal elbow room at NTCNA. With some improvisation, wiring specialist Jeremy Chambers packed up all the equipment he needed to do his job and set up a home laboratory in his basement. Taking with him all the (wire) leads and crimping tools, along with all of the documentation to do it.

"He managed to carry on like that along with regular communication with fellow engineers involved with the project. Any kind of direct conversations can be handled over Zoom (teleconferencing platform)," says Flotkoetter.

Test, test, test

The remote nature of testing has also been extended into actual road vehicle testing, made easier due to the reduced traffic volumes in all towns and cities these days. Some audio test engineers

"Many of our engineers have been afforded the time to go deep into hypothesizing different design options, unlike before"



Nissan Centre
director of
technology
planning and
research **Bob**
Flotkoetter



have had to convert their home driveways into temporary test studios - much to the chagrin of some neighbours hearing the intermittent blaring of car radio speakers.

Depending on team sizes, complexities and production schedules, meetings between most parties can be held daily or weekly, Flotkoetter says.

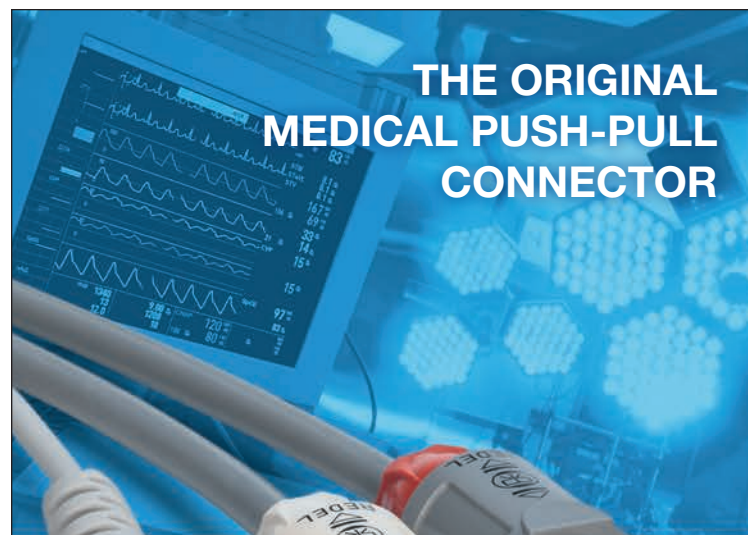
He assures the flow of projects are moving smoothly, as the internal metrics tracked by NTC-NA received a 'high' rating on issue resolution. Collaboration with suppliers is also conducted on a daily basis, as not all are operating at full capacity.

"By staying on top of these relationships, we have been able to stay on track of all the milestones we set out, and we are

working towards ensuring that we don't allow the unique work environment to cause any delays for us," he adds.

Flotkoetter anticipates that the unique Covid pandemic environment will actually spawn innovation once things settle down.

"I anticipate a heightened sense of awareness for personal hygiene and sanitation within the automotive sector, as a result of this," he says. "If there is one thing this experience has taught us is - it is important to be open to change - to embrace change. We are going to look back at this moment and pull out the good points and the improvement points, and it may redefine the way we conduct our business in the future." **EP&T**



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Digi-Key team steps up during COVID-19 challenge

Commitment, support remain key within distribution facility

BY SHANE ZUTZ, VICE PRESIDENT OF HUMAN RESOURCES, DIGI-KEY ELECTRONICS



While the COVID-19 pandemic brought the world to a virtual standstill, the team at Digi-Key Electronics remained vigilant in its support of customers with the products and tools needed to continue innovating through the most challenging of times.

While the world is still sorting through the implications and long-term impacts, one constant is true: electronic designer and engineers need reliable, steady supply chains to successfully continue their businesses.

Digi-Key has managed to deliver consistency and continuity through this difficult time, providing more than 10.2-million products globally, with more than 2.2-million in stock and available for immediate shipment (within 24-hours to North American customers), from more than 1,200 name-brand manufacturers.

All electronic component distributors are designated as an essential service, exempt from Minnesota's statewide shelter regulations in place.

At headquarters, Digi-Key has done its part to prevent the spread of COVID-19 with strict social distancing, increased deep cleaning, and having roughly 2,000 employees work from home, replacing face-to-face



To maintain safety in the Product Distribution Center, the Digi-Key team created a fogger tunnel to disinfect totes using ultraviolet light including the elimination of COVID-19.

meetings with video calls and restricting travel.

Employees have stepped up in ways never imagined before. Many business-side employees have been working overtime on the Product Distribution Center (PDC), while others have completely switched over to PDC work for several weeks-on-end; placing their day-jobs on hold. An unprecedented number of employees, at all levels, have shown up on week-ends and stayed late, just to

make sure every order got out the door on time.

Collaboration

A team of Digi-Key's engineers also worked in partnership with the University of Minnesota to design and supply additional ventilators needed to keep critically ill COVID-19 patients alive.

Digi-Key is also supplying components to customers manufacturing thermometers, motion-activated hand sanitizing stations, and equipment needed for employees working remotely. Due to the demand for such critical components, Digi-Key has experienced an unexpected surge in purchase order activity.

The entire DK team focuses on the mission of fueling our customer's innovation, as well as its own. Most recently, employees took a resourceful approach to maintaining safety in the PDC by creating a fogger tunnel to disinfect totes using ultraviolet

light. The UV light eliminates any viruses – including COVID-19 – as it passes through the tunnel on the package assembly line.

Digi-Key's centrally located warehouse in Minnesota serves all of its global customers, and continues to maintain strong relationships with logistics partners, while bringing additional support and consistent delivery of products. Digi-Key is working closely with its carrier partners to mitigate impact on cargo plans.

Updates and FAQs on the firm's website (<https://www.digikey.com/en/help/coronavirus>) assist customers, while keeping in constant communication with suppliers.

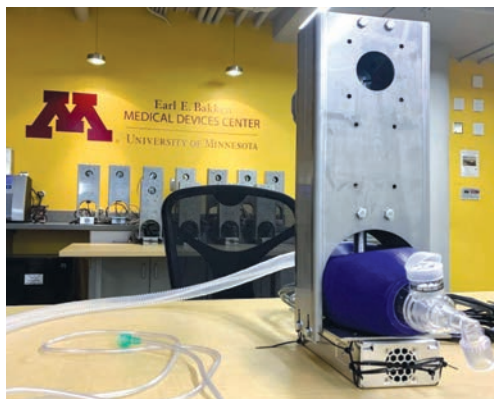
Digi-Key has also identified a customer need – multi-shipment consolidation (MSC), which allows customers to accumulate orders over a period of two or three days, depending on the number of weekly invoices. Customers can choose two days in a week and then Digi-Key will consolidate all the orders into that time-slot. This is especially helpful during the current business period, where companies may be trying to reduce contact and also time spend in the office awaiting shipments.

Adding more than 200 suppliers and 300,000 products over the past two years, Digi-Key is also streamlining supplier profiles by expanding its traditional component sectors served, into other industries beyond engineering, design and manufacturing. This extension is part of the Marketplace initiative, incorporating products, services and solutions for all phases of the technology innovation ecosystem.

While these are unprecedented times, Digi-Key continues to monitor the situation with suppliers, receiving regular updates on lead-time changes. Factories in China are slowly getting back up and running, however, it will take some time for them to resume full production. **EP&T**



Shane Zutz is vice president of human resources at Digi-Key Electronics Corp. www.digikey.ca



The Coventor, is a low-cost ventilator approved by the FDA and developed and designed by University of Minnesota researchers in partnership with Digi-Key and several other Midwest - companies.

PHOTO SOURCE: The University of Minnesota; Digi-Key



POWER INDUCTORS REDUCE DC RESISTANCE UP TO 40%

COILCRAFT

XGL4030 Series of high-performance, molded power inductors provide up to 40% lower DCR than the previous best-in-class inductors, as well as low ac losses, delivering an overall efficiency over a wide range of ac ripple current. Devices are suitable for dc-dc converters with switching frequencies ranging from hundreds of kHz to 5MHz and above. Device delivers an expanded inductance range, including 18 values from 0.13 to 12.0µH, with current ratings up to 26.5 Amps and soft saturation characteristics.

➤ www.coilcraft.com

SMT CONNECTORS SERVE LOW PROFILE BOARD-TO-BOARD DESIGNS

ADVANCED INTERCONNECTIONS

Mezza-pede 1.0mm pitch SMT connectors are designed for low profile board-to-board or flex cable-to-board applications where long-term reliability and a compact size are required. Devices provide low profile design with a mated height of 2.92mm. With firm's enclosed screw-machined socket, 6-finger contact and heavy gold plating, product series passes the 20-day mixed flowing gas (MFG) test required in many telecom and other severe environment and long-life applications. Device's over-molded lead frame seals the surface mount leads to prevent solder wicking, ensuring a secure solder joint.

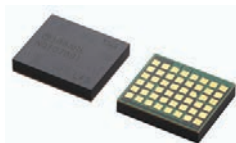


➤ www.advanced.com

6A FULLY INTEGRATED BUCK DELIVERS LOW PROFILE

MURATA

MYTNA1R86RELA2RA low-profile, efficient, fully integrated 6A dc-dc converter comes with a footprint 30% smaller than competing solutions and has a 25% lower profile without sacrificing efficiency. Buck regulator is designed for 2-cell, 3-cell and 12V point-of-load applications where high efficiency, a



low profile and small solution size are

critical. Device provides an input voltage range of 6.0V-14.4V and a programmable output of 0.7V-1.8V at up to 6 amps. Product's peak efficiency exceeds 90% for 12V input to 1.8V output.

➤ www.murata.com

MINIATURE CONNECTOR SUPPORTS WEIGHT, SPACE REQUIREMENTS

ODU-USA

AMC advanced miniature connector portfolio is suitable for applications that require significant weight and space reduction. Product series delivers high performance data transmission, high reliability and easy handling. Product portfolio includes a USB 3.1 Gen1, USB 2.0, Ethernet and an HDMI option. The



USB 3.1 Gen1 data transmission rate is up to 5Gbit/s, the USB 2.0 data transfer ranges from 12Mbit/s to 400Mbit/s, the Ethernet data transfer rates between 10Mbit/s to 10Gbit/s and the HDMI data transfer rates up to 8.16Gbit/s.

➤ <https://www.odu-usa.com>

3-PHASE BUILT-IN FILTER COMES WITH NEUTRAL LINE

SCHURTER



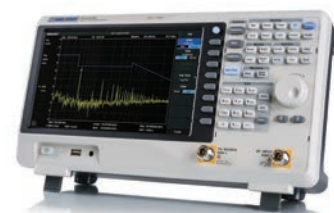
FMAD CP 1-stage filter family for 3-phase systems is equipped with neutral line. The compact and high-performance device is suitable for use in tight spaces and for devices with high EMC loads at low or medium power. A metal flange screwed to the chassis guarantees a good ground connection. Terminals are 6.3 x 0.8mm quick-connect. Device can be used over a temperature range of -40°C to 100°C, although the filter specifications are designed for currents from 3A to 20A at an ambient temperature of 50°C.

➤ www.schurter.com

RF ANALYZERS EXTEND BANDWIDTH TO 7.5GHZ

SIGLENT

Model SVA1075X Spectrum and Vector Network Analyzer provides a frequency range up to 7.5 GHz, while Model SSA3075X Plus Powerful Spectrum Analyzer comes with reliable automatic measurements in frequency ranges up to 7.5GHz. Both RF instrumentation units meet the growing need for higher bandwidths in testing circuit designs for 5G applications. Both series provide flexible and efficient user interface concept, including a 10.1" touch



screen, web server for easy remote control, and the ability to connect external mouse & keyboard.

➤ www.siglentna.com

WIRE CUT & STRIP MACHINE CAN INCLUDE ROLLERS, BELT TRANSPORTS

SCHLEUNIGER

EcoStrip 9380 cut and strip machine provides a complete feature set at an economical price point. Unit can be configured with rollers or belt transports and the configuration can



be quickly and easily changed by the operator. The unique 3-position design of the optional belt feeding system further enhances the user's capabilities and can be set for normal mode, roller mode or short mode processing.

➤ www.schleuniger-na.com/delmar

HAND-HELD ENCLOSURES ARE FLAME RETARDANT

HAMMOND

1552 family of hand-held ABS enclosures are IP54 rated UL94-Vo flame-retardant and are available in six sizes. Units feature an ergonomic design that fits comfortably into the hand, enabling it to be used for long period in applications, such as a machine controller or an electric



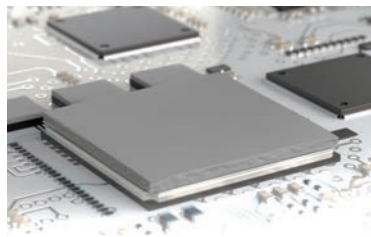
hoist control. The end panels are removable for easy modification and for use with flying cables, an alternative end panel with an integral rubberized cord protector and a strain relief bracket is available. An optional wall mounted holder allows the unit to be stored in a convenient location when not in use.

➤ www.hammmfg.com

HIGH THERMAL GAP PADS BOOST CONDUCTIVITY IN POWER DESIGNS

HENKEL

BERGQUIST GAP PAD TGP 10000ULM thermal interface materials (TIMs) address the high power density challenges associated with new 5G telecom infrastructure and consumer mobility designs. Product's formu-



lation provides exceptionally high thermal conductivity of 10.0W/m-K within an ultra-low modulus, low assembly stress formulation. The combination of these characteristics boosts the material's performance.

➔ www.henkel-adhesives.com

COMPACT POWER CONNECTORS BOOST DENSITY

PHOENIX CONTACT

M12 Power range of high density, compact power connectors come with a form factor suitable for power applications. Product series is available in 12 or 17 poles as plug and socket versions. Device's housing is zinc diecast and rugged to withstand



industrial environments including water spray or temporary submersion. Product's Piercecon connection is completed without soldering, crimping or any special tools and is especially designed for field installation.

➔ <https://www.phoenixcontact.com>

PROXIMITY SENSORS DELIVER IO-LINK WITH LONG SENSING RANGE

OMRON AUTOMATION AMERICAS

E2EW Series same-sensing-distance proximity sensors provide long sensing ranges. The highly durable, metal face proximity devices have been optimized to withstand the harsh conditions of typical automo-

tive welding processes with a fluororesin coating that provides increased spatter resistance. The



sensing range is approximately twice as long as previous models for ferrous metals and six times as long as previous models for aluminum, making them suitable for mixed-metal production lines.

➔ automation.omron.com

POWER SUPPLIES BOOST EFFICIENCY WITH UP TO 4 INDEPENDENT CHANNELS

ROHDE & SCHWARZ

NGP800 power supply series includes two and four channel models, and further extends the functions and performance available for dc power. Unit boosts the efficiency for any test and measurement application requiring up to four independent dc power supplies with full flexibility, full functionality, full safety and full connectivity. Product features a large 5" high resolution touch screen that displays detailed statistics. Five models provide maximum flexibility for voltages up to 250 V, currents up to 80 A and power up to 800 W.

➔ www.rohde-schwarz.co

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Sealcon provides customers a diverse selection of enclosure



solutions to meet the demands of today's industries. Protecting vital components from the elements is a major priority, so our products are designed for both indoor and outdoor applications. To avoid

assembly complications, specific integration services are available upon request and can be implemented on all enclosure solutions to ensure a functioning product for your assembly.

➔ www.sealconusa.com

CONVECTION COOLED SINE WAVE INVERTER IS IP66-RATED

ABSOPULSE ELECTRONICS

CSI 1K-24/230-3XD3-HSF is a 1kVA addition to firm's line of IP66-rated



dc-ac sine wave inverters with pure convection cooling. Device is designed for applications where a suitable heatsinking surface is not available and only pure convection cooling is feasible. Inverter is built with three power modules packaged in IP66-rated die cast aluminum enclosures. A heatsink assembly is attached to the under-surface of each IP66 module, which is attached to a baseplate, providing pure convection cooling.

➔ www.absopulse.com

BLUETOOTH 4.2 COMPLIANT EVALUATION KIT IS VERSATILE

FUTURE ELECTRONICS

Panasonic PAN1326C2 Evaluation Kit is versatile, all-inclusive and consists of one daughterboard (ETU) for TI's development board and one TI adapter board. The Bluetooth 4.2



compliant kit provides best-in-class RF performance.

Panasonic's tiny footprint technology has produced a module measuring 85.5mm² for use in space constrained applications. Product is suitable for accommodating a pcb pad pitch of 1.3mm and as little as two layers for implementation and manufacturing.

➔ www.futureelectronics.com

IC FAMILIES DELIVER MMWAVE SOLUTIONS

RENESAS

F65xx transmit active beamforming



ICs and F692x low-noise amplifiers deliver a performance boost for antennas used in Satcom and radar systems, and address the thermal and integration challenges designers face as they transition from bulky mechanically scanned antennas to lower weight and profile active electronically scanned array antennas. Devices provide a combination of low power consumption, high gain and compact size.

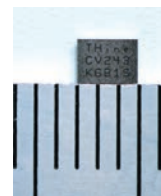
➔ www.idt.com/us/en

PUBLISHER'S PICKS

CHIP EXTENDS MIPI CSI-2 TRANSMISSION FOR HIGH DEF ENDOSCOPE CAMERA

THINE ELECTRONICS

THCV243 MIPI CSI-2 serializer IC chip allows engineers to extend MIPI CSI-2 transmission to greater than 15-meters



with a tiny 2.1mm x 2.9mm package. Available in high-volume orders, device significantly reduces a number of cables between the camera and processor board by aggregating the GPIO-type bidirectional control signals. Device permits a small camera form factor, which is a critical requirement for medical endoscope camera applications. Chipset supports 'Sub-Link' that aggregates bidirectional low speed signals, such as GPIO.



California Eastern Laboratories

Contact: Mark Shapiro
mshapiro@srs-techpr.com
➔ www.cel.com



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SUPPLY SIDE

DIGI-KEY BROADENS REACH WITH T&M

Digi-Key Electronics has expanded its product portfolio by signing a North American distribution partnership with Siglent Technologies, an electronic test and measurement solutions provider. This expansion is part of the DK+ initiative, Digi-Key's continued growth as a world-class distributor to provide products, services and solutions for all phases of the technology innovation ecosystem.

"We're excited to partner with Digi-Key because it enables us to leverage their strong brand so that customers can purchase Siglent products as part of their DK+ initiative," says Dave Stuart, general manager at Siglent Technologies. "Digi-Key is one of the largest electronic compo-



nent vendors and adding Siglent test and measurement equipment enables a customer to fulfill their component requirements as well as their test equipment needs. From an administrative perspective, Digi-Key's process is very efficient and the portal makes it easy for Siglent to monitor the order process and fulfill orders to our customers' expectations."

ACA TMETRIX ADDS GAUSS INSTRUMENTS

Gauss Instruments, a Germany-based manufacturer of ultra-high-performance EMC test equipment and provider of advanced EMI test solu-



tions has signed a distribution agreement with ACA TMetrix Inc., Mississauga ON, a leading supplier of test instruments and design tools. The agreement gives ACA TMetrix rights to resell Gauss Instruments throughout Canada.

Gauss Instruments specializes in providing test solutions that rapidly

advance product development and testing capabilities, while accelerating time-to-market cycles. Since its foundation in 2007 Gauss Instruments has been simplifying EMC, making product certifications and precertification tasks easier than they've ever been.

AVNET EXPANDS MEAN WELL AGREEMENT

Avnet customers in the Americas will now have full access to the Mean Well power supply portfolio of products.

"Mean Well lead times are some of the shortest in the industry with the majority of SKUs as standard, off the shelf parts," says Alex Iuorio, Avnet VP supplier mgmt & biz dev. "Avnet's customers will benefit by getting di-



rect access to Mean Well products and the specialized technical support of Avnet."

"Avnet's specialized technical skills, extensive product and supply chain knowledge will translate into faster time to market for our customers," says Jessica Chang, distribution sales manager, Mean Well.

EMA PARTNERS WITH DASSAULT SYSTÈMES

EMA Design Automation Inc., a full-service provider of electronic design automation (EDA) solutions, has entered into a partnership with Dassault Systèmes that aims to drive disruptive business transformation



for electronic product development. This partnership will work towards the joint mission of connecting teams across a common data model for unified product development and collaboration.

"Our electronics expertise combined with the 3DExperience platform allows us to break down traditional communication barriers, providing organizations with a single source of truth to deliver truly differentiated experiences for their customers," says Manny Marcano, president and CEO of EMA.

The 3DExperience platform provides businesses with insight into all phases of the design cycle, naturally connecting the organization in one digital environment. EMA will be providing sales

SAGER UNVEILS BATTERY LINE CARD

Sager Electronics, an authorized distributor and value-add reseller working with many of the industry's top battery brands, recently rolled out a new battery solutions line card through its specialized group, Sager Power Systems.



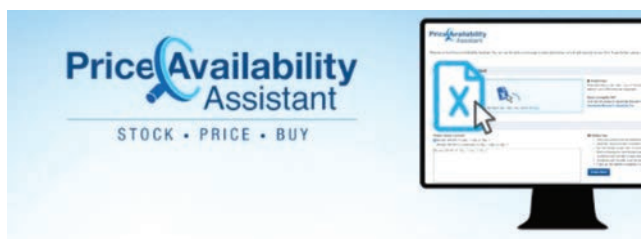
The full-color line card showcases both its standard battery offering, as well as custom battery packs designed and manufactured in the company's 18,000 sq. ft. Battery Solutions Center, located in Lisle IL. The piece also details the value-add capabilities for batteries available from Sager including SolidWorks 3D modeling, battery case design and prototyping, ultrasonic welding, fuel gauging, in-house test and qualification lab, and product safety testing and certification.

NEWARK ADDS ODU CONNECTORS

Electronic component distributor Newark, has initiated a supplier franchise with ODU-USA, offering the connector solution provider's entire portfolio. The arrangement will include access to the ODU Mini-Snap, ODU Media-Snap and ODU Mini-Med to Newark customers in Canada.

"Engineers and designers operating in today's dynamic market need innovative connector solutions to support their product designs," says Michael Ulch, head of product management, IP&E, Newark. "The addition of ODU to our line card underscores our commitment to providing our community of designers and engineers with reliable and high-quality connector solutions to bring their ideas to market."





MOUSER UNVEILS SEARCH ASSISTANT

Mouser Electronics Inc. has unveiled its a Price and Availability Assistant that allows customers to easily check prices and availability on millions of semiconductors and electronic components. Customers simply drag and drop, type in or load (copy and paste) a parts list with desired quantities for rapid pricing and availability results.

Using the new tool, customers can access spreadsheet files or copy and paste order data, adding up to 200 part numbers, with up to three different quantities per part number. The tool returns exact part matches for each line and offers replacement options for non-orderable part numbers.

ALLIED EXPANDS SUPPLIER NETWORK

Allied Electronics & Automation has bolstered its terminal block and synchronous drive application product offerings by adding a full suite of products from Amphenol-Anytek and B&B Manufacturing. distributor has also added nVent Caddy and nVent Erco as trusted suppliers to increase its electrical application and installation offerings.



These additions enhance Allied's portfolio of more than 300 world-class suppliers and more than three million products available online.

"We are proud of our robust and distinguished network of trusted suppliers," says Frank Cantwell, vice-president of supplier and product management at Allied. "Adding these firms to our portfolio bolsters our product offering and ensures we have the best range and quality of products throughout the Americas."

PIXUS TECHNOLOGIES HITS 10TH YEAR

Pixus Technologies marks 10 years as a provider of embedded computing

and enclosure solutions in 2020. The Waterloo ON-based company was founded by senior management from Kaparel Corp., which was a premiere provider of high-performance back-plane designs and innovative cooling solutions.

Kaparel was acquired by Rittal in 2003, but the firm eventually decided to focus on its line of large cabinet



enclosures. Pixus was formed to support the North American embedded systems business and continued to expand its presence in a wide range of applications leveraging a highly modular design of thousands of component options.

Pixus has since created hundreds of new COTS designs, broadening its capabilities in defense, high-performance embedded computing, and telecom systems.

HEILIND INTERCONNECTS WITH SMITHS

Heilind Electronics has expanded its Americas connector portfolio with the addition of Smiths Interconnect – a global manufacturer of advanced connector solutions. The agreement positions Heilind as a global partner for Smiths Interconnect, expanding upon its current distribution deal in Europe and Asia.

In the Americas, the distribution agreement includes both Heilind Electronics and Interstate Connecting Components (ICC), the mil-aero division of Heilind. The Smiths Interconnect offering will include the Hypertac and Sabritec technology



brands, providing a robust offering of harsh environment interconnect products for aerospace, defense, medical, space, industrial and rail applications.

"The advanced technologies that Smiths products provide, coupled with Heilind's position in North America, further our value proposition with our customers across multiple markets," says Alan Clapp, VP of supplier business, Heilind Electronics.

RICHARDSON RFPD SIGNS SDP TELECOM/MOLEX

Richardson RFPD, an Arrow Electronics company, has entered into a global franchise agreement with SDP Telecom/Molex, which designs and manufacturers RF and microwave solutions for the wireless communications industry.

SDP Telecom was founded 1995 and acquired by Molex in 2015. SDP Telecom/Molex is headquartered in Montreal, and also has manufacturing facilities in Suzhou, China.

The global agreement between Richardson RFPD and SDP Telecom/Molex includes the complete standard product portfolio of circulators and isolators for wireless infrastructure applications from 600MHz to over 6GHz, including a 28GHz circulator that is currently available for sampling. Customization is also available.

"SDP Telecom/Molex solutions are used by top-tier wireless infrastructure equipment makers to improve signal transmission efficiency over wireless networks," says Rafael Salmi, Ph.D., Richardson RFPD's president. "We look forward to providing these products to our global base of customers."



PROTOTYPING OF 3D-PRINTED ELECTRONICS

Additively manufactured electronics (AME) / printed electronics (PE) provider Nano Dimension Ltd. announced that its fabrication facility NaNoS is fully operational at the firm's South Florida headquarters.

NaNoS creates prototypes and short production runs of high-performance electronic designs (Hi-PEDs). Overnight fabrication capability is now available for North American customers. One of NaNoS's first successful orders was prototyping printed circuit boards used for new breathing-support-ventilators, which required fast response and short supply chain. Overnight, Nano Dimension successfully printed fully functional pcbs for the medical devices in high demand during COVID-19 pandemic. **EP&T**



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Special Feature
Contract Electronics Manufacturing

Tech Update Newsletters

August 10 – Industrial Automation
August 24 – Connectors

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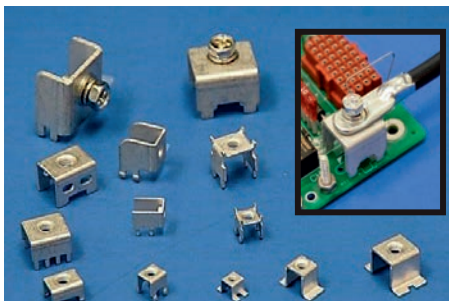
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SPECIAL INDUSTRY REPORT



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Women in Electronics

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



Irene Sterian is Engineering Director at Toronto-based contract electronic manufacturer Celestica Inc., where she

works with a global team of senior engineers to provide customer solutions in the areas of electronics technology for healthcare, industrial, aerospace, enterprise, energy, and telecommunication market segments. In addition, Irene is cross-appointed as the president & CEO of ReMAP, which she founded in 2014 to form an integrated shared ecosystem to accelerate innovations developed in Canada for the global market.



What is your message to female engineers seeking to take on leadership roles?

I focus on keeping a positive mindset while mitigating the negative. I was willing to take risks and forge ahead even when I faced roadblocks to reach my goals. I looked at setbacks as learning opportunities while building on my achievements. Asserting myself required some key valuable traits. I've had to be a seeker, a life-long learner and a great communicator. I point to my success by asking to tackle big challenges versus waiting for someone to offer them to me. I started my first large scale project at IBM by asking to be a team leader in Japan. From there, I forged ahead, leveraging the support from my loudest cheerleaders, including my male engineering counterparts. I haven't stopped since.

How would you sum up the work/life balance advice you share with female engineers and their employers?

I consider it more like a work/life integration. We all juggle many roles and need to be realistic about our approach to productivity. A successful work/life integration that encompasses work/personal/family needs requires creativity to determine what works best. I like to schedule blocks of work time separate from one-on-one time with my family. I manage flexible working hours, conflicting



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.

priorities, and a demanding schedule using virtual meetings and electronic devices. I have created a supportive environment that enables my team to develop a work/life integration that works best for them to optimize performance and job satisfaction.

How important is it to enjoy the full work experience, as it relates to work environment, and the people you work for and with?



Good ideas proliferate at the edge. I'm a proponent of life-long learning. My best ideas come from reading a lot of business books; meeting new people; being curious; as well as attending/speaking at conferences and workshops that are on the periphery of my knowledge. When you work with a diverse team of Engineers and supporting roles, then there is a cohesiveness when you all have a passion for why you are there.

How can women feel more connected to the engineering community?

Find your tribe. There are like-minded people to connect with in your profession. I have found mine in organizations such as,

SPIE Women in Optics, Women in Aerospace Canada, and Women in Automotive. The Surface Mount Technology Association (SMTA) has a Leadership Program to promote mentoring and building career paths. Within each organization are opportunities to develop personal growth, network, and increase the visibility of women in STEM.

Be a mentor and a mentee—Be open to the opportunities. Someone taught me how to do e-introductions and without knowing it, he became my networking mentor. Mentoring doesn't have to be long term—It's better to have several mentors over time as your career changes.

I leverage industry and advisory groups and speaking opportunities. I can mentor many at one time with one talk.

How can women be encouraged to stay in engineering?

In the digital economy, every company is essentially now a tech company. As an engineer, your technical skills are highly transferable in many areas of an organization. Your expertise can be a launch pad that will open doors for other opportunities to build a rewarding career. For example, as automobiles become more autonomous, it's estimated that 60% of the car will need to be redesigned – with approximately 40% of that being the electronics. This will create many opportunities in electronics engineering.

Another example is smart manufacturing. As manufactured products and processes become more complex and productive, they give rise to a host of highly qualified personnel in non-manufacturing and/or non-engineering jobs. As factories get smarter and more advanced, the job multiplier increases significantly.

Why is it important to have women leaders in engineering firms?

In my experience, women are the team builders and are great leaders because they leverage the strengths of their team and position them where they are more likely to shine. Diversity creates a competitive advantage for innovation. ReMAP, an all-female executive team, relies upon a diverse group of partners and their contributions. The inclusion of under-represented groups in research, technology innovation and entrepreneurship creates a positive impact for any business. The latest research indicates that the more diverse an organization is, the more successful a company will be.

EP&T

For more Women in Electronics, check out www.ept.ca.

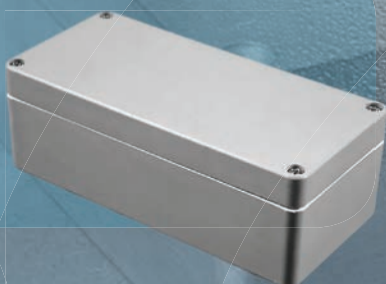


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