EP&T

ELECTRONIC PRODUCTS & TECHNOLOGY

MAY 2022

CANADA'S INFORMATION LEADER FOR ELECTRONIC ENGINEERS AND DESIGNERS

EPT.CA

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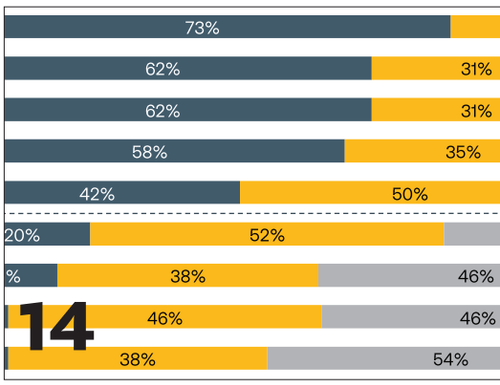

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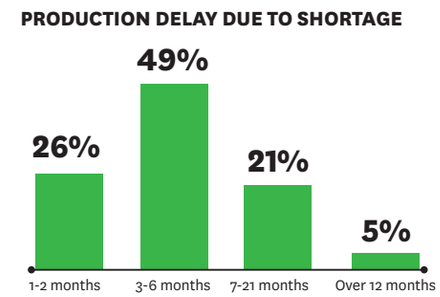

Cover photo: ProEV
Photos (this page, from top): ProEV; TE Connectivity; WHMA; Avnet

Data privacy a growing concern for Tech users

Is it just me or is 'Big Brother,' the fictional character and symbol of George Orwell's dystopian 1949 novel Nineteen Eighty-Four becoming more of a reality these days? It seems that I am not alone with these feelings. The results of a recent study conducted by NordVPN, global providers of Virtual Private Network (VPN) services, shows that users of tech devices are increasingly concerned over their data privacy.

It is interesting to note that their thoughts do not exactly pair with their actions however – as most tech users display consistent willingness of checking a box saying they have read and understood a website's privacy policy. If you were to actually read the privacy policies of Facebook, Twitter, Amazon, Apple and Google to find out the data big tech companies have on you - the results might surprise you.

The latest research by NordVPN shows that 86% of consumers are concerned about their data privacy. Nevertheless, 89.5% of Canadians freely share some of their most sensitive information while using internet services. Among the types of information they share are their full addresses (69.8%), relationship status (47.7%) and bank details (20.7%).

Most tech users in society don't have a legal background to actually understand the privacy policy, and no one has the time, patience, or energy to try to parse what data websites are storing and how they're using it to their advantage. As a result, most users fail to protect their privacy, while experts emphasize that data remains the most vulnerable asset in the world, with 97% of businesses using data to power their performance.

"These days, banks begin to monitor people's online activity before giving them loans, politicians write speeches based on electors' Twitter posts, and cities are built based on data collected by smart garbage bins," explained Daniel Markuson, a digital privacy expert at NordVPN. "So data that is collected affects us in a very literal way and may directly be used against users in the real world."

According to Markuson, personal data can affect people's financial situation, their country's election results, their living conditions and the justice system.

Financial services

Financial service providers, like banks, lenders and insurance companies, use data about their customer's behavior, interests and personalities to determine their creditworthiness. A good example is a company called Lenddo, which estimated its clients' credit score based on a person's social network. Furthermore, ZestFinance, a company that provides credit scoring based on their machine learning platform, found that people who write in all-caps are less likely to repay their loans.

"We increasingly have no idea what determines if we can or can't get a loan or how much our car insurance may cost. On the other hand, those who try to figure it out and 'crack the system' start to use their social media accounts to get a better deal from the bank rather than to express their thoughts," Markuson adds.

As cities become 'smarter,' even more data gets collected to serve the needs of their residents. In the city of the future, there is no place for privacy.

"In Singapore, sensors and cameras were placed all over the city, and it allowed the government to track every step citizens made. Beijing Airport has recently deployed a face-recognition system, so travelers don't even need passports. It all sounds good until we think about activists, who can easily be tracked thanks to such technologies," Markuson adds.

Sooo, what can we do to protect our privacy?

"Data manipulation by companies has both positive and negative effects on consumers. But, it is much easier to control the impact if we have knowledge about what information is collected and how," states Markuson, who provides some tips for maintaining privacy.

- **Know your threat model.** A threat model is an analysis of how vulnerable you are and who might want to take advantage of that.
- **Use the right tools.** Once you know your threat model, you can choose your tools based on how you browse the internet and what information you need to protect.
- **Learn good internet habits.** The best security or anonymity tools won't help you if you fall for a scam or decide to share private information on social media. Make sure you understand the tools you use online and where your data may end-up when you share it.

In an effort to better safeguard your personal digital footprint, maybe this is the year to request a 'old-school' flip-phone from Santa? **EP&T**

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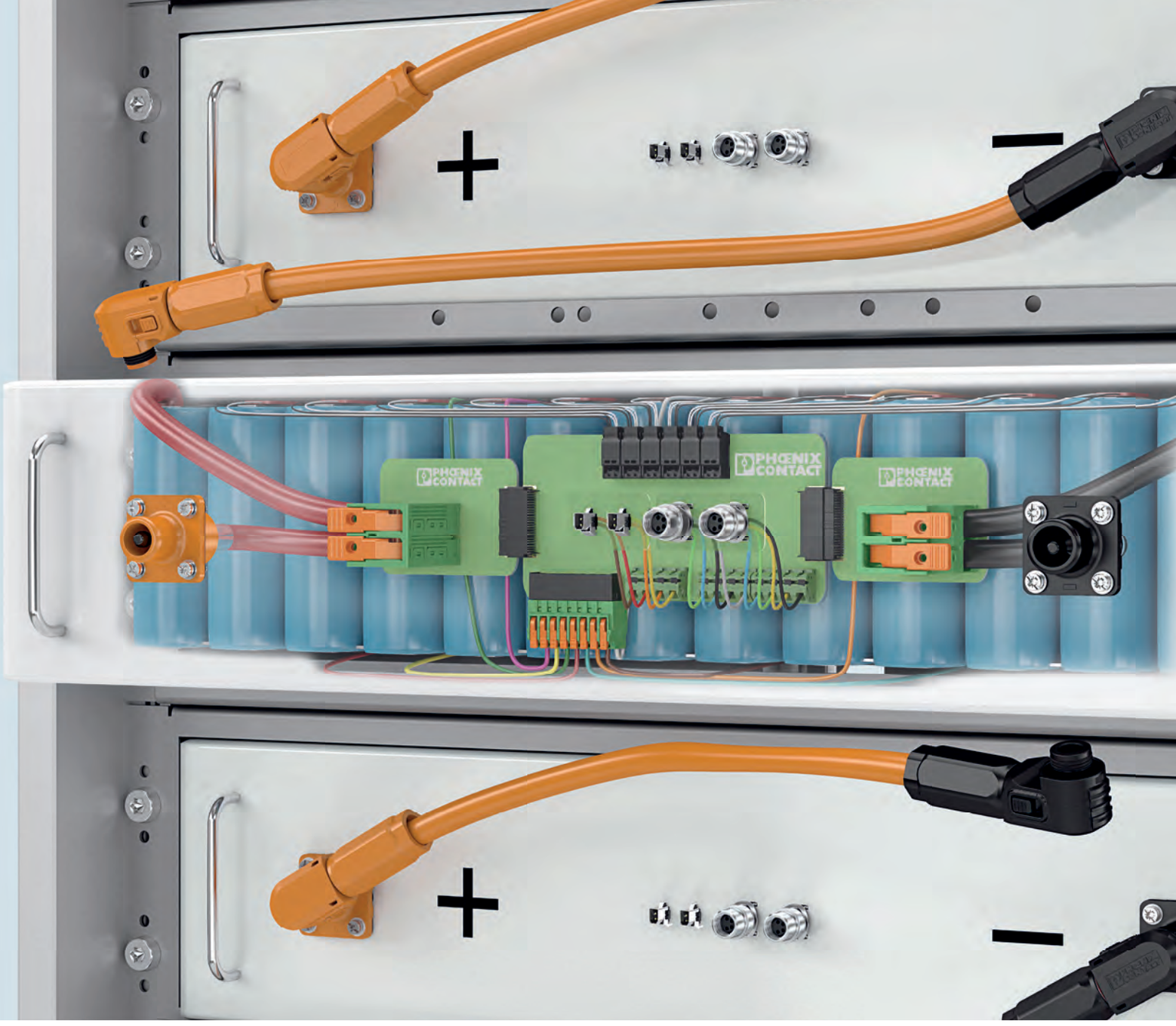

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INSPIRING INNOVATIONS

NEWSWATCH

ARTIFICIAL INTELLIGENCE

OTTAWA FIRM DEVELOPS HUMAN-LIKE AI PLATFORM

An Ottawa firm has developed the first human-like conversational intelligence platform using Artificial Intelligence. The technology, called bluecap was launched by Uncanny Lab Ltd., and inspired by opportunities arising from slowdowns associated with Covid-19. The firm was established in 2020 by co-founders Fuad Miah and Justin Hacker.

They describe bluecap as AI intelligence that enhances the meeting experience for both hosts and attendees. But, it does more. It lets participants focus on the meeting instead of tasks like note-taking by creating a full transcript and recording of what transpired and then crafting a concise executive summary. It also uses the collected telemetry (conversation data pertaining to context, emotion, etc.) to create an advanced analysis of performance and even sentiment.

"We already have more than 200 users with Zoom, Microsoft Teams and Google Meets," Hacker said. "This is a new concept for virtual meetings, in-person meetings and hybrid meetings which utilize both."

How does it work? bluecap uses facial and voice recognition technology, along with natural language processing, so you can quantify and measure elements of corporate culture. That means everything from people's emotions and sentiments to trust and care.

What is new about bluecap is that with the collected telemetry it creates and automates comprehensive profiles of every person/contact and organization involved in a meeting. Every interaction is measured, analyzed and visualized, which then lets you take action.

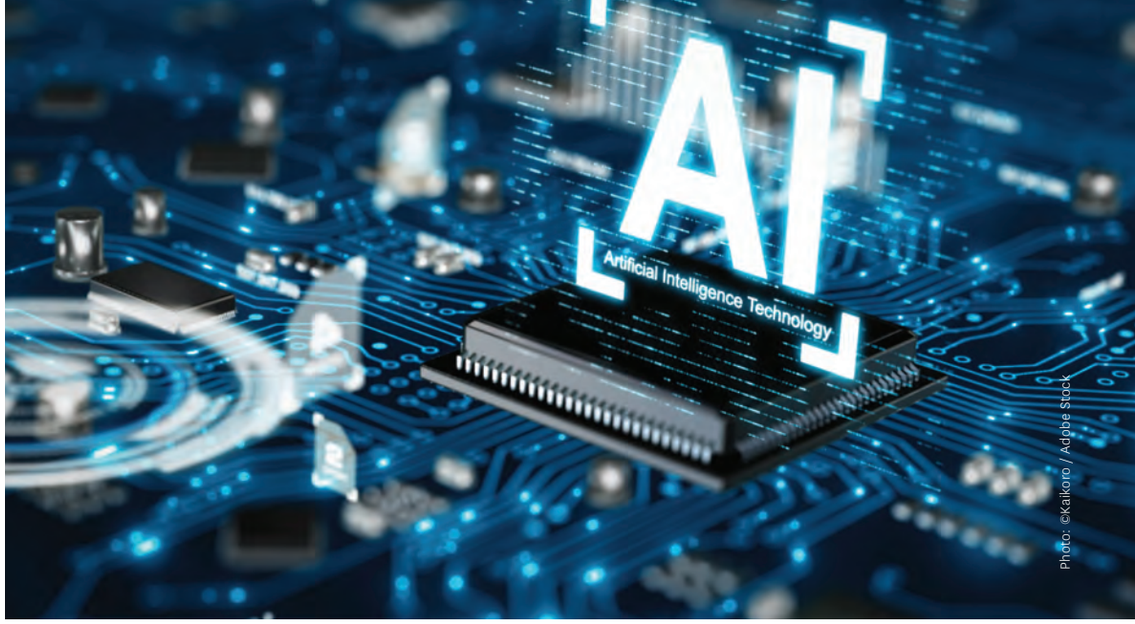


Photo: ©Kaikoro / Adobe Stock

AI platform bluecap uses facial and voice recognition technology, with natural language processing.

Human-like conversational AI platform bluecap was launched by Uncanny Lab Ltd. in Ottawa.

MARS PARTNERS WITH SCALE AI

MaRS has entered phase two of its partnership with SCALE AI, the federal artificial intelligence supercluster, to support commercialization of Canadian supply chain solutions companies. Twelve ventures will participate in the Supply AI program at the Toronto-based innovation hub to refine its product offerings, create and implement scaling strategies and grow their teams and brand awareness.

"The pandemic has exposed massive fault lines in our supply chains and this cohort of AI innovators are working overtime to solve many of these problems," said Jon Dogterom, seniorVP of venture services at MaRS. "The partnership will accelerate their progress and ultimately strengthen supply chains here in Canada."

With funding support from the federal and Quebec governments, SCALE AI supports startups to try and bring artificial intelligence from the lab to the field. The Supply AI program and access to the MaRS ecosystem hopes to accelerate Canada's growth in the field of smart supply chains.

This cohort of AI firms spans the worlds of high precision robotics, autonomous vehicles and carbon emissions reduction. The group includes a maker of first-and last-mile delivery robots, a company that reduces food waste by creating logistics efficiencies and another that is using AI to create more sustainable forests, while reducing the cost of lumber at the same time.

MaRS will work with the cohort ventures to increase revenue, help them access capital and attract the right talent, as well as tap into new markets and enable operations.

SENECA ESTABLISHES AI RESEARCH CENTRE

Seneca has received $641,800 from the Natural Sciences and Engineering Research Council of Canada (NSERC) to support applied research on artificial intelligence (AI) technologies that are critical to maintaining a strong Canadian economy.

NSERC grant will help establish CIAIT innovation centre.

The grant will help establish the Centre for Innovation in Artificial Intelligence Technologies (CIAIT), where Seneca researchers will collaborate with industry partners to find AI solutions in sectors ranging from advanced manufacturing and commerce to creative media and finance.

"Seneca is grateful for this NSERC funding, which will allow for more applied research that accelerates the adoption of AI-powered solutions for small- and medium-sized Canadian enterprises," said Ben Rogers, dean, Seneca Innovation.

"These projects also offer students with invaluable experiential learning opportunities and connections to potential employers."

CIAIT research, conducted by Seneca's data scientists, will focus on business decision support, content analysis and management and cybersecurity. Examples of real-world applications include live transcription through speech modeling, predictive analytics to optimize battery systems, project performance management through machine learning and document classification using AI.

5G

ROGERS LAUNCHES CANADA'S FIRST 5G STANDALONE NETWORK

Rogers Communications has launched the first commercial 5G standalone (SA) network in Canada and one of the first globally, turning on the next-generation service after completing the rollout of Canada's first national standalone 5G core and the country's first 5G standalone device certification. "We are thrilled to be the first in Canada to launch a commercial

Photo: Adobe; Seneca College

5G standalone service," said Jorge Fernandes, chief technology officer at Rogers Communications. "This milestone underscores our ongoing leadership in 5G and will bring immediate benefits to customers by increasing coverage, scalability and availability, and improving network response times, enabling a world of new use cases and applications."

Rogers 5G SA Core network has been built from the ground-up, based on the latest cloud native technologies, enabling more advanced wireless capabilities like ultra-low latency, network slicing and mobile edge computing and expanding Rogers 5G footprint.

Rogers 5G SA is built to scale massively and will support the unprecedented growth of IoT devices in the years to come. 5G Core and 5G RAN slicing enables Rogers to deliver innovative new services to customers such as dedicated private networks, public safety applications and access to edge compute for AR/VR consumer applications.

INNOVATION

HARDWARE CATALYST INITIATIVE EXPANDS WITH MEDTECH STREAM

Leading technology hub, ventureLAB, has announced a $2.5 million investment from the Government of Ontario to establish a MedTech-specific stream within its Hardware Catalyst Initiative (HCI), Canada's only lab and incubator for hardware and semiconductor companies.

The funding is part of the Ontario Together Fund, from the Ministry of Economic Development, Job Creation and Trade, and builds on a $9.7 million investment from FedDev Ontario. The timely investment will enable ventureLAB to support made-in-Ontario medical solutions and will strengthen Ontario's MedTech sector and technical capacity to fight COVID-19 and respond to future pandemics.

Since opening in 2020, HCI has supported 24 Ontario hardware and semiconductor companies that have raised millions of dollars in investment capital, created new jobs, and generated valuable intellectual property.

To establish an IP-rich semiconductor industry in Ontario that will generate a wealth of economic and employment opportunities – and to meet the growing demand for homegrown hardware companies – the funding will expand the Hardware Catalyst Initiative's state-of-the-art testing and prototyping capabilities.

The funding will also be used to establish a MedTech-specific stream, with a new lab in Vaughan, Ontario, focused on the unique hardware and semiconductor needs of healthcare companies.

By accessing HCI's network of 35+ global industry leaders – who have committed over $50-million in resources and mentorship – as well as ventureLAB's in-house experts with decades of designing, manufacturing, and go-to-market expertise, MedTech founders will experience accelerated commercialization time, reduced cost, access to deep sector expertise, and intensive growth capital.

The two-year project will result in high-quality employment opportunities as well as a range of made-in-Ontario technologies, innovations, and intellectual property.

CNDN PREPARES NEXT GEN OF KNOWLEDGE ECONOMY LEADERS

Canada's National Design Network (CNDN) continues to produce a walking technology transfer to Canada' tech industry, according to the results of a recent study on its alumni and the training of highly qualified personnel (HQP) in Canada.

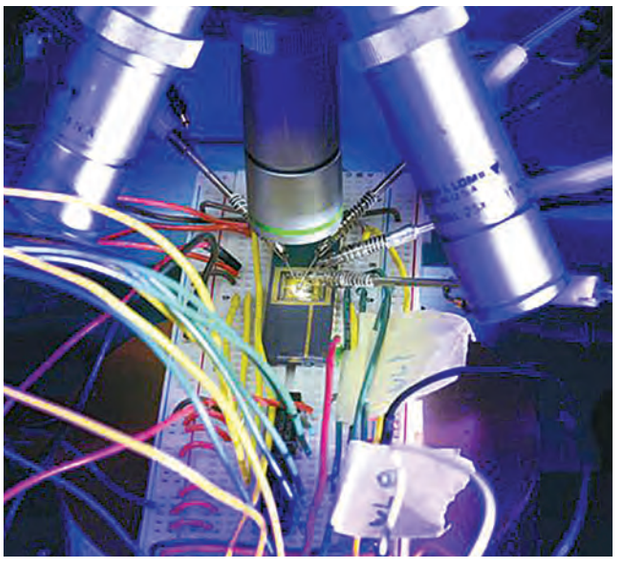
CNDN, managed by Canada's leading hardware technology facilitator CMC Microsystems, delivers technology services in design (CAD), fabrication (FAB), and research (LAB) to more than 10,000 researchers in Canadian universities, colleges and companies for designing and manufacturing microsystem and nanotechnology prototypes.

The network is focussed on areas of R&D that have high impact on Canadian industry and economic growth, such as the IoT & AI, quantum, microelectronics, photonics and micro electro-mechanical systems (MEMS).

CNDN researchers bring a holistic skillset into the marketplace, as they receive training in intellectual property matters, export controls, confidentiality agreements, licensing requirements, and infrastructure-sharing, according to Gord Harling, president and CEO of CMC Microsystems.

Highlights include:

- On average, 700 HQP join industry in Canada annually.
- Increased employer productivity: Thanks to training received at CNDN facilities, Canadian firms saved training costs averaging $7 million to $10 million annually.
- Accelerated career progression: Alumni are about twice as likely to be in executive or management positions within ten years, and about 25% more likely after 20 years.
- Greater employee retention and engagement: CNDN alumni remain with their employers longer than peers who did not use CNDN.
- Over 70% of CNDN alumni continue to work in Canada for over 20 years in a hypercompetitive, globally integrated marketplace.



Canada's National Design Network delivers tech services in CAD design, fabrication and research.

ALTITUDE ACCELERATOR

Competitive invite only program provides start-up founders access to mentors, advisors.

BRAMPTON TECH HUB UNVEILS INCUBATOR PROGRAM

Brampton Ontario-based technology start-up incubator Altitude Accelerator launched its newest tech hub cohort. The program will run six months until September 30, 2022. This is the 17th consecutive incubator class for Altitude.

Altitude's competitive invite-only incubator program offers technology start-up founders access to top-tier mentors and advisors, expert-led workshops, and peer support. The program is focused on intensive marketing and sales strategies to build market traction for future investment.

"Investors want quantitative evidence that there is market demand for a new product," said Pam Banks, executive director at Altitude Accelerator.

"Our incubator program is specifically structured to help founders demonstrate this demand to potential investors. We are thrilled to welcome the companies selected for Incubator 17 and are excited to help them during this stage of their start-up trajectory."

Incubator 17 includes start-up companies from a wide array of industries.

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

Photo: CNDN

Solving the tech labour shortage in Canada

Vancouver tech recruiter VanHack fills a specialized niche

BY SOHAIL KAMAL, WEST COAST CORRESPONDENT

Labour shortages are not a new phenomenon in Canada. But, as the economy recovers and the job market bounces back, the pressure on employers is intensifying. With an aging demographic, coupled with a growing economy and the legacy of the COVID-driven Great Resignation, it is no surprise that local companies are serving up strategies to counter talent shortages.

According to the Business Development Bank of Canada (BDC), "55% of Canadian entrepreneurs are struggling to hire the workers they need, which leaves them with no choice but to work more hours, as well as delay or refuse orders. In addition, more than a quarter are having a hard time retaining their employees."

This is where Vancouver-based tech recruitment agency VanHack has successfully filled a niche. West Tech Report recently spoke with Ilya Brotzky, CEO of VanHack, about the current job climate, what makes the company unique, and how it has been successful by taking advantage of the extraordinary conditions brought by COVID.

Some history

VanHack was established in 2015. The idea for its business model came as a result of four years spent in Brazil. It was there that Brotzky met a lot of tech professionals who wanted to move to Canada, and as time progressed, he also encountered many companies hunting for talent. So, in 2016 VanHack pivoted to focus on satisfying this reciprocating dynamic - and as luck would have it, in 2017, a new visa process came about, making it even easier to hire talent from abroad, according to Brotzky.

"The name of the visa is Global Talent Stream, which gives individuals a two-year work permit," he explains.

A new Canadian work visa process came about in 2017, making it easier for tech firms to source talent from abroad.

Ilya Brotzky is CEO of VanHack, a Vancouver-based tech recruitment agency.

"VanHack prides itself as being 'simply the fastest way for companies to hire tech talent.'

That's not a light boast, given the current job climate. These days, almost every company needs to be tech savvy. Companies have learned, perhaps the hard way, that they cannot rely on brick and mortar sales, and traditional marketing methods when lockdowns and restrictions are in place.

"The pandemic has accelerated a shortage of tech staff, as a result. Covid-19 has also made it necessary for staff to work remotely anyways, which has taken away the traditional barriers to hiring someone from abroad," analyzes Brotzky. "The result? We have gone from 45 to 80 full-time staff in under two years, including a layoff of 15 staff at the start of the pandemic. The layoffs make sense, if you recall, that no one was looking to hire staff in March of 2020."

Beef up technical departments

This really speaks to Vanhack's largest challenge since inception. When Covid hit, companies stopped hiring, directly hitting the core of VanHack's service offering.

"That was very scary. We did our only set of layoffs at that time – relieving a third of our staff," says Brotzky. "That is a massive amount of layoff and growth in two years. In hindsight, we are glad it all worked out, and it really was a matter of being in the right place at the right time."

In the past 24-months, demand for talent has bounced back - companies are raising wages and firms that were not necessarily tech companies before are now put in a position to beef-up their technical departments.

Some history

"This is especially true for senior developers, to lead your tech team. There weren't as many people who learned to code 15-years ago compared to now. Companies are clamoring to hire people who can lead others and mentor others," Brotzky explains.

For the prospective job seeker, VanHack helps prepare them for the selection process with mock interviews. Once hired, VanHack assists the candidate with the entire visa and relocation process.

From the employer's side of any hiring procedure, VanHack's global mobility team conducts most of the heavy lifting with the work visa process. The recruiter also supports fully remote hires. Or, combines both by starting remotely and then relocating.

For a company whose primary mission is to 'Create a world where talented tech professionals can migrate to wherever they are needed to help companies innovate and grow,' VanHack will have a lot to offer for the foreseeable future. **EP&T**

To learn more, go to ***www.vanhack.com.***

In the past 24-months, demand for talent has bounced back - companies are raising wages and firms that were not necessarily tech companies before are now put in a position to beef-up their technical departments

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

Photo: VanHack

GaN power ICs are green!

Each clean component shipped saves 4kg CO2 per year

BY NAVITAS SEMICONDUCTOR

A recent sustainability report produced by Navitas Semiconductor, an industry-leader in gallium nitride (GaN) power ICs, highlights how the firm's GaN technology supports global carbon 'net-zero' ambitions by reducing its customers' CO_2 footprints and accelerating the evolution from fossil fuels to renewable energy sources and electricity-based applications.

The report comprehensively quantifies the positive impact of GaN power semiconductors on climate change based on global standards. The study includes a third-party Lifecycle Assessment (LCA) of GaN technology according to ISO14040/14044, the international standard for assessing environmental impacts throughout a product's life cycle — from raw material acquisition through production, use, end-of-life treatment, recycling and final disposal. The Navitas report also quantifies corporate Greenhouse Gas (GHG) impacts through third-party assessments.

Gallium metal is derived as a by-product when smelting aluminum, and nitrogen is readily-available in our atmosphere, so GaN has a minimal material-origin CO_2 footprint, is easily sourced and low cost. GaN is also non-toxic and free from conflict-mineral concerns. And although GaN is an advanced 'wide band-gap' semiconductor material, GaN power IC devices can be manufactured using older, well established and available

CMOS processing equipment (350nm). As a result, GaN device production today yields three to five times greater output for a given equipment set when compared to traditional silicon power devices.

As a next-gen power semiconductor, GaN runs up to 20x faster than legacy silicon and enables up to three times more power and three times faster charging in half the size and weight. Navitas' GaNFast power ICs integrate GaN power and drive plus protection and control to deliver simple, small, fast and efficient performance. Due to advanced-material performance and Navitas' proprietary AllGaN process design kit, GaN power ICs are much smaller than silicon chips, and have much lower CO_2 footprint to manufacture and ship.

High-efficiency, high-speed applications using GaN power ICs are smaller, lighter and use less material and less energy than silicon systems. For example, a 65W laptop adapter with GaN has up to 30% lower footprint – delivering a net-benefit of over 4kg of CO_2 reduction per GaN IC shipped. In data centers, GaN has the potential to save over 10-million tons of CO_2/year through increased efficiency. When GaN is considered for EV applications like on-board chargers, dc-dc converters and traction drive, it is estimated that an upgrade from silicon to GaN could accelerate the worldwide transition from internal combustion engines to EVs by three years, and reduce total road-sector emissions by 20% per year. The report also explains how GaN ICs drive down cost-per-watt of energy conversion and storage in solar power applications to support cost reductions of up to 25% - reducing payback periods and accelerating adoption.

"Our technologies can increase our customers' ability to achieve their own CO2 emissions targets by reducing the end-use electricity and material requirements of their products," says Navitas CEO and co-founder Gene Sheridan. "We contribute to power and emission reductions in every major market segment across mobile, consumer, industrial, computing, communications and transportation, and strive to be a critical enabler of improvements in electrification and energy efficiency to meet the Paris Accord's Net-Zero goals as highlighted in the IEA's World Energy Outlook 2021 report."

***Navitas Semiconductor** is a leading supplier of GaN power ICs. https://navitassemi.com*

Photo: Navitas

Harnessing the wire & cable market

ProEV to open dedicated wire harness & engineering facility in Montreal

BY STEPHEN LAW, EP&T EDITOR

While the world shifts from the manufacture of petrochemical fueled vehicles, the supply infrastructure for alternative electrical versions has begun – and a Canadian operated business is sitting in the driver's seat.

ProEV, a spin-out from leading global electrical harness provider Electrical Components International (ECI), will open North America's largest dedicated wire harness and engineering facility for commercial and industrial electric vehicles (EVs) in Montreal this summer.

Specializing in smart, connected and electrified solutions for anything that does not represent a passenger vehicle, ProEV has put its focus on becoming a one-stop-shop for full vehicle architecture concept of handling all the harnessing and electronics for EVs that encompasses trucks of all classes, buses, recreational, agriculture equipment and mining vehicles.

"They are putting so much tech into these EVs that they more resemble the smartphone in your pocket, versus the vehicle they once represented," enthused ProEV president Jarred Knecht, refering to the increasing amount of sensors, connectivity, safety systems built in their design today.

After dipping a toe in the EV market seven years ago, ProEV noticed some discernable challenges facing both start-ups and established OEMs alike. It related specifically to high voltage cables, including a lack of supply and inflexibility of the product itself. This lead the firm to making its own wire and cable. It wasn't long before ProEV began producing low-voltage harnesses, which parent ECI had 30-years of experience doing.

These orange colour-coded, high-voltage wire & cable harnesses have become the backbone to electrical vehicle designs today.

Jarred Knecht is president of ProEV , which specializes in engineering and producing high voltage wire & cable harness assemblies for EVs.

Orange is the new green

"High voltage cable is like the high-tech version of old school cable. In the past, we had no need for these orange, double-shielded cables in large volumes. Now, we live and breathe orange – it's everything," Knecht says.

All of ECI's global customers will direct their designs to the Montreal facility for engineering and manufacturing for the electrification projects they are working on. This allows ProEv to work with its North American base, while gaining access to European clientele as well - having its pipeline filled by ECI.

"Because we have such purchasing power and scale – the mix of having a local Canadian resource for this type of engineering and production performed quickly, all while being able to scale unlimitedly, is a very attractive thing. We are the leader in that regard. We handle the prototyping – get right in the mud with the OEM to work through their designs – and then if they want to build anything between 50,000 and 100,000 vehicles - we can handle it as a one-stop-shop," Knecht states.

Montreal facility is recruiting

While currently retrofitting a building previously occupied by CEA Inc. on the West Island of Montreal, ProEV is completing improvements and installing equipment at the 60,000-square-foot facility, which is slated to open in August 2022. Knecht anticipates ProEV to grow to approximately 250 employees within the first five years of operation. To achieve this goal, the firm is actively recruiting engineers of all types - electrical, mechanical, industrial. There is also a need for hiring program managers or project coordinators, which help to organize activities between all of its different departments.

Photo: ProEV

The Applied innovation Group – ProEv's version of an R&D department - is comprised of a team of experts developing next generation technologies to use in manufacturing processes or other parts of our business.

"The applied innovation team can work with engineering if there is something that comes up at an early stage on a customer's product that we need to figure out," notes Knecht. "The innovation team will also work alongside the engineering team on the production floor, understanding that some of the processes and where there could be added-value to a product."

Depending on its design and application, a finished wire harness could be constructed of anywhere between 20 to 200 different components, according to Knecht. ProEV deals with all component brands when it comes to selecting or working with suppliers. ProEv will often extend the reach of its business connections to its OEM customers, who may be in need of very specialized support or resources.

"Our vision is to utilize our full skill-set to build technology products. Our in-house applied innovation team has created cutting edge proprietary technologies, using artificial intelligence and robotics to assist our production teams in building safety-critical products for our customers," he said.

Green capitalism

The rising costs of gasoline has most corporations operating fleets of commercial vehicles that deliver goods and services to the end-user re-evaluate their transportation costs. Knecht is convinced that switching to an electric vehicle platform is the answer, not to mention an environmentally sound option.

"The move from gas to electric vehicles is the biggest change I am going to see in my life, for sure. For that reason, we demonstrate a great deal of passion towards what we do here," Knecht says. "We love this (supplier) space. We want to attack the most polluting vehicles on the planet, which is also why we specialize in commercial industrial. These vehicles are the worst. They are on the road 24-hours a day, they burn so much more fuel while creating more emissions and noise than passenger vehicles."

According to the EPA, 80% of emissions come from 20% of vehicles volume, namely commercial and industrial vehicles, whereby passenger vehicles represent 80% of vehicle volume and 20% of emissions.

"Supporting the supply chain for commercial and industrial EVs is imperative for the environment, economy and establishing of a hub for manufacturing and innovation in North America," says Knecht. "Job creation, and economic growth in the new technology era is at the cornerstone of our nation. Our dedicated EV center of excellence will work with our customers globally to support the electrification of all vehicles, leading the charge into the next generation of clean, sustainable transportation."

Global reach

Knecht says ProEV's involvement with ECI makes it a global business overnight – operating 37 plants around the world, employing more than 25,000 people. The new Montreal facility represents the global centre of excellence for EVs, on behalf of ECI.

"We have a tremendous amount of resources to our advantage – while specializing here at the new facility in wire harnesses and engineering – focused on EVs in the commercial industrial sector," Knecht says. "Between ourselves and the reach of ECI, we can pretty much deliver on almost any request of specialization."

One thing is clear, the new dedicated facility represents ProEV's commitment to invest in the future of EVs and will benefit the industry and the economy, according to Knecht.

"We have been doing this for seven years now, which has allowed us to work with a lot of OEMs and vehicle architectures. Thus, when it comes to working on a new prototype, we are able to insert ourselves at any point in the design process," he concludes. **EP&T**

Five things you need to know

When selecting rugged fiber optic connectivity solutions

BY MARK BENTON, RUGGED FIBER OPTICS ENGINEERING AND ACTIVE PRODUCTS MANAGER, TE CONNECTIVITY

1 | *Understand your target and the technology tradeoffs needed to hit it*

As with any project involving electronics, the kinds of components selected depend on the performance criteria the project is trying to meet. There is no single solution that will always work in every situation. Therefore, it's important to understand the tradeoffs between different technologies when aiming at your performance target.

Fiber optic connectors are used to couple a light source, receiver, and other components to a fiber optic (FO) cable. Of the many types of fiber optic connectors, each generally employs one of two connection technologies:

- Physical contact (PC) technology that physically mates the two ends of optical fibers together
- Expanded beam (EB) technology that uses lenses at fiber end faces to expand and re-focus light within a small air gap in the optical pathway.

When selecting between the two types, considerations include environmental variables (exposure to water, dust, vibration), termination finishes (insertion loss, return loss, misalignment, angularity), maintainability (repair, cleanability, wear), and cable limitations (bend radii, wavelength range). Clearly understanding your operating environment and your signal power budget is critical in connector selection.

As shown in Figure 1, PC connector technology excels at minimizing insertion loss (IL) and return loss (RL) while maximizing wavelength range. On the other hand, EB connectors are more tolerant of misalignment, vibration, dust, and wear, because of the small gap in the optical pathway eliminates maintaining pristine physical contact.

Performance Criteria	PC	EB
Insertion Loss	****	**
Return Loss (SM)	****	**
Return Loss (SM) – Unmated	*	**
Lateral Connector Misalignment	*	****
Connector Angular Tilt	****	*
Mating Durability	**	****
Water Exposure	***	**
Dust Exposure	*	***
Vibration Susceptibility	**	***
Repair	**	**
Cleanability	**	****
Wear	*	****
Wavelength Range	****	**

FIGURE 1: *A comparison of physical contact (PC) and expanded beam (EB) fiber optic connector features. Courtesy TE Connectivity.*

FIGURE 2: *TE Connectivity D38999 Series III Style Circular Connectors with a self-locking, anti-vibration coupling mechanism and up to four MT ferrules capable of accommodating up to 96 optical channels*

2 | *Don't be dense about density requirements*

Another high-level consideration is the application's signal density requirements. Today, there is a real push for higher density—especially inside the box for VPX embedded systems. For I/O between boxes, there's demand for high fiber path count through small 38999 connectors. Single fibers and single contacts increasingly can't be used, because there just isn't enough space to aggregate them to create multiple paths. The alternative is to group them in a ribbon and terminate them in a multiple fiber ferrule, namely, a mechanical transfer (MT) ferrule connector. In the commercial datacom world, MT fiber optic ferrules provide super-high-density interconnects that accommodate 12 to 96 fibers in a compact and lightweight ferrule. MT ferrules deployed in VPX applications in harsh environments typically have 12 or 24 fibers per ferrule resulting in up to 48 fiber paths in a half VPX module. Plus, there are MIL-DTL-38999 Series III based expanded beam connectors available that provide one-turn self-locking anti-vibration coupling mechanism for up to 96 optical channels (Figure 2). With these solutions, you can get the best of both worlds—high signal density and harsh-environment performance.

3 | *Know the ins and outs of termini*

How the connector is terminated is important in reducing insertion loss (IL) and back reflection. For PC connectors, two basic polishing approaches can be used. Flat polished surfaces for PC and ultra—physical (UPC) contacts are generally acceptable for digital optical traffic. But for optical sensing applications (such as light detection and ranging [LiDAR]) and radio frequency (RF) over fiber applications, return loss (RL) needs to be minimized. In these cases, angle polished ferrules (APC) are used to minimize RL.

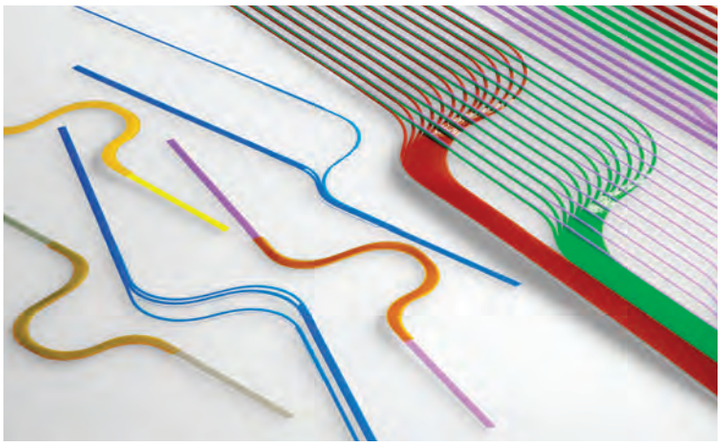
For EB connectors, lack of physical contact reduces mating forces. Because lower or no spring force is required, EB connectors maintain consistent IL over multiple mating cycle. Robustness is also enhanced in harsh and dirty environments as previously mentioned—but with additional expense.

That's because with EB connectors, subcomponents and ceramics must be combined with proper termination and polishing procedures. The contacts inherently involve lenses, which add cost.

Photo: TE Connectivity

FIGURE 3: ***TE Connectivity's ruggedized optical backplane interconnect system meets VITA 66.1 and 66.4 open architecture specifications for VPX systems and provides a high-density, blind-mate optical interconnect in a backplane/daughtercard configuration. The fiber optic ribbon cable interconnect feeds through the backplane to removable system modules using MT ferrules.***

FIGURE 4: ***TE Connectivity's versatile, high-density Optical Flex Circuit Cable Assemblies can be utilized for card-to-card or backplane applications and offer multiple options in terms of cable assembly designs, connectorization, and routing.***



However, when properly constructed, EB connections can yield consistent IL values less than 1.0dB.

The same polishing/performance rules apply to MT ferrules, which are molded as flat (typically for multimode fiber) or APC (typically for single mode fiber) configurations. In terminating these various designs, changing the polishing fixtures is the main difference. Lensed MTs (EB) typically have the lens molded into the ferrule, so no polishing step is required, but you have to cleave the ribbon fiber precisely.

4 | *Understand connector materials, form factors, and sizes*

The ferrule—the rigid tube used to protect and align the end of a fiber—is a very critical connector component. Fiber optic ferrules can be made of ceramic, metal, or composite materials. Generally, fiber ferrules for PC connectors are made from ceramic or metal materials. Each material has its benefits and drawbacks, with ceramic or metal ferrule typically used for harsh-environment applications.

Ferrules are next supported in inserts, which also come in a range of metal, composite, and polymer materials. Choice tradeoffs typically are lower weight versus higher durability, materials compatibility with various fluids, and, in some cases, the need to incorporate face seals on the inserts.

Various connector form factors are available, namely rectangular and D38999 circular styles with metal and composite shells, inserts, and related components. Typically, the shells and other components used are the same as with copper versions. The inserts, however, are dedicated to FO contacts or in some cases hybrid (copper and FO) contacts. The latter is typically only used in low-mating applications because oxides from copper may contaminate the FO termini.

5 | *Wrap your mind around new cabling options*

A fiber optic cable consists of five main components: core, cladding, coating, strengthening fibers, and cable jacket. Cabling considerations are influenced by whether cables are being routed within a box or between boxes or active devices in limited spaces.

As mentioned previously, multiple fiber ribbon cables can accommodate multiple paths. Moreover, ribbon cable can be broken out into individual contacts. This is often the case between MT ferrules on the VPX backplane to the I/O box connector in those cases where traffic routes to multiple locations or the end points.

Optical flexible circuit assemblies (FCA) are an advance over flexible flat ribbon cables (FFC). Comprised of hundreds, even thousands, of individual fibers precisely positioned on a single rugged substrate, FCAs offer a multifiber management solution for high-speed electronic packaging. FFC advantages include:

- Full customizability for both card-to-card and backplane applications, with one defense application using an FCA that has 3000 paths
- Ruggedized with thin film encapsulating each fiber for protection in the harsh environments of aerospace, commercial and military aircraft, and defense systems.
- Versatility of employing crossovers to minimize stress while fitting complex routing arrangements
- High backplane-level speeds between two processor cards with all the I/O coming off a parallel transceiver through the FFC operating just as fast as a backplane.

Moreover, new material sets are becoming available to handle space applications as well as traditional aerospace and defense (A&D) applications with stringent radiation-hardening and volatile organic compound requirements. **EP&T**

TE Connectivity is a global supplier of rugged fiber connectors for harsh environments. For more information, visit: ***https://www.te.com/usa-en/campaigns/industrial-solutions/rugged-fiber-for-rugged-applications.html***

Photo: TE Connectivity

Sector outlook remains strong despite mounting headwinds

Russia-Ukraine war adds pressure to harness industry

BY SHAWN G. DUBRAVAC, PHD, CFA - IPC CHIEF ECONOMIST

Each month, IPC publishes a report examining the current sentiment of the wire harness and cable assembly industry and the expectations for the months ahead. In the last month, the outlook has dimmed slightly. This has been driven by numerous forces, including the Russian invasion of Ukraine.

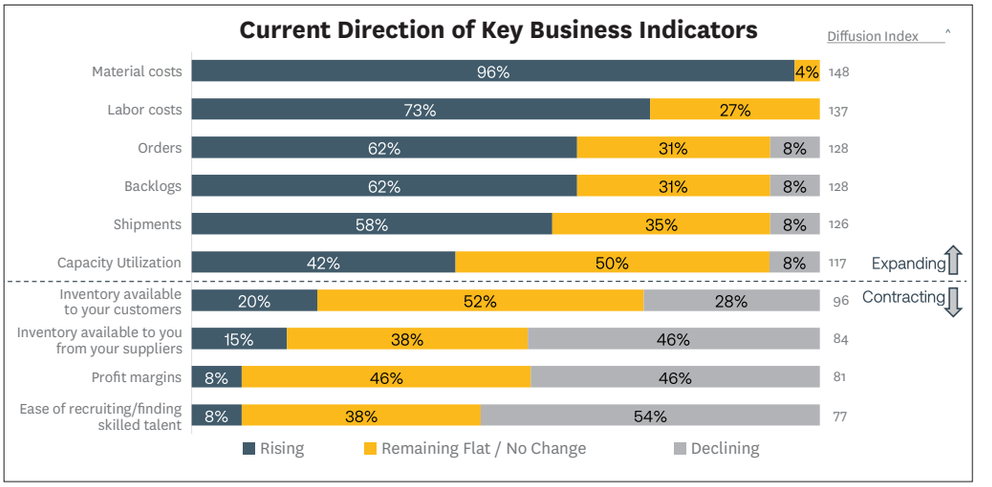
The attack and subsequent trade sanctions has put pressure on already strained supply chains. The offensive also put upward pressure on prices, which further exacerbates the challenges faced by the industry. But, despite these new challenges compounding existing challenges, the outlook remains strong. Order flow continues to be positive and backlogs are robust, suggesting the outlook for demand remains strong even as headwinds mount.

Russia launched its invasion into Ukraine in February 2022. In the ensuing weeks, the industry began to feel pressures from those actions. Global sanctions have put upward pressure on the prices of diverse resources. In some cases, primarily where Russia is a key global supplier, sanctions have also put pressure on the availability of key inputs.

Roughly four-fifths of wire harness manufacturers expect the war to have a negative impact on transportation costs, while three-fourths expect it to negatively impact commodity prices and three-fifths anticipate a negative impact on the stock of raw materials. Notably, most wire harness and cable assembly manufacturers are anticipating no change to demand for the things their company produces as a result of the Russia-Ukraine conflict when compared to the rest of the electronics manufacturing supply chain, who are instead more likely anticipating a negative impact to their business. Manufacturers expect the automotive, consumer and industrial electronics markets to be most negatively impacted by conflict, while anticipating the defense market to be positively impacted.

Costs up across the board

The wire harness and cable assembly industry is feeling the pressure of higher prices and expects prices to continue to rise in the coming months. In April, the industry's material costs index rose to 148, matching its highest level. Wire harness makers are nearly uniformly in agreement that material costs are up. While the vast majority expect prices to rise further over the next six months, the Material Costs Outlook Index did decline slightly over the last month.



Supply chain challenges remain acute. Inventories available to customers (our IAC Index) slipped into contractionary territory this month, suggesting inventory levels remain low. While executives expect this to improve over the outlook horizon, the outlook has dimmed somewhat in the last month.

Executives also report that inventories available to them from their suppliers (our IAFS Index) improved marginally but remains in contractionary territory. This suggests the majority of respondents are experiencing inventory constraints. At the same time, the outlook for this indicator improved over the last month. Executives expect inventory available for suppliers to improve over the next six months.

Inflation rates bring challenges

Industry demand remains robust despite higher prices, growing uncertainties, and continued supply chain challenges. The New Orders Index declined in the last month but remains well in expansionary territory. The outlook has weakened, but the majority of respondents expect demand to remain strong in the months ahead. Moreover, backlog orders remain high and executives expect them to remain high for at least the next six months. The strong backlog in orders provides some cushion should demand slow. It will provide wire harness manufacturers more time to adjust to slowing demand.

While most headlines are focused on the implication of the war on economic growth, it is not the only risk we should be worried about - high inflation rates. Last month the Federal Reserve initiated its first-rate hike. The Fed also signaled six more rate increases are coming by the end of the year. These increases will bring the target fed funds rate to nearly 2%. Furthermore, another 3 to 4 rate increases are expected in 2023 which will push the target fed funds rate to just under 3%.

Higher rates will slow demand which in turn will hopefully ease supply chain constraints and other supply chain dislocations. The Federal Reserve has set a very hawkish tone. With strong job growth and low unemployment, the Fed will be able to focus almost exclusively on battling inflation over the next 18-months. The European Central Bank (ECB) had also said a hawkish tone but it is now unclear how severe the spillover from the Russia-Ukraine war will be on economic growth in Europe. As a result, the ECB will have to be more tepid with rate hikes in the coming year.

There is some risk that the Federal Reserve will overshoot monetary tightening. Monetary policy works with a lag but given the current high rate of inflation, the Fed may not have the luxury of waiting for the full transmission of rate hikes to work their way through the economy. The Fed will have to watch closely the rate of the economic slowdown that takes place over the next year outside of any slowdown produced by restrictive monetary policy measures.

There are numerous risks exerting influence on the wire harness and cable assembly industry, but overall, things remain optimistic about the near-term outlook. EP&T

For more info on IPC's monthly report for the wire harness & cable biz, email ShawnDuBravac@ipc.org.

Photo: IPC

Your Opinion Matters

CANADA'S ELECTRONICS INDUSTRY REPORT

An *in depth* look at the state of the Canadian electronics industry.

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Chip shortage to usher in transformative design-procurement / supply chain partnerships

BY PEGGY CARRIERES, VP SALES ENABLEMENT & SUPPLIER DEVELOPMENT, AVNET

Since Avnet surveyed its customers in late 2021 about their challenges with the component shortage, the industry is making slow progress to finding an end to the current constraints.

But, when we do get there, the electronics engineering world as we know it will be fundamentally changed and stronger partnerships will be formed with procurement and supply chain experts.

The crunch is not due exclusively to a temporary lack of availability of specific components. The demand for electronic content -- in everything from automobiles to light bulbs and beyond -- is on the rise, with no end in sight. Component suppliers are expanding capacity yet supply and demand are still out of balance for the thousands of electronic components we rely upon daily.

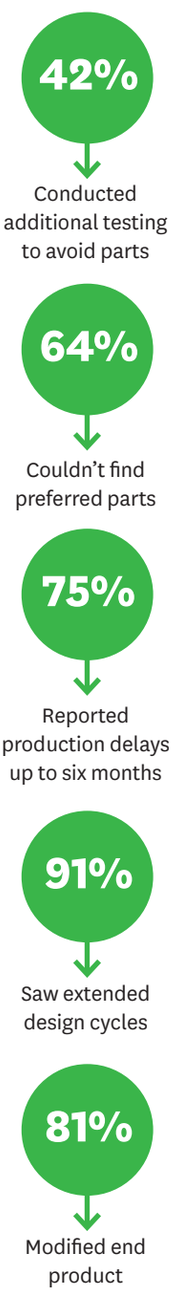
What we're experiencing now is unlike anything that has come before, with an impact that will affect every aspect of our lives.

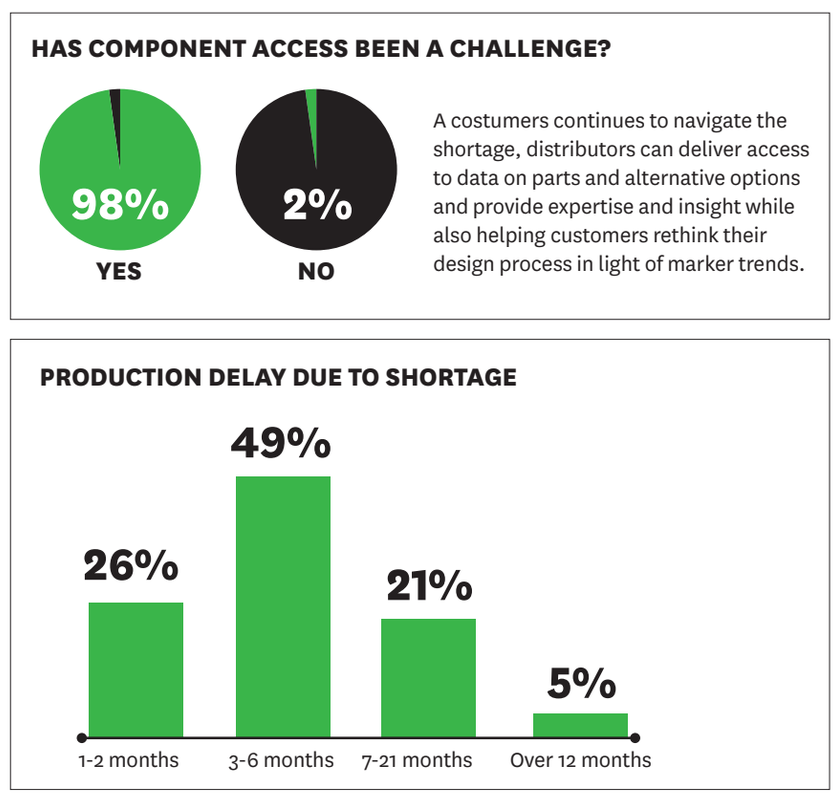
I think we're going to come out of this situation with two major shifts in mindset:

- Inventory will be considered more of an asset, not a liability in the manufacturing process.
- The design process will extend well beyond the board -- with procurement and the supply chain as fundamental to component selection.

Chip shortage deconstructed

A major finding of our inaugural Avnet Insights survey, '*Deconstructing the chip shortage*,' is that the global component shortage is not merely extending order fulfillment and lead times. It is also having a ripple effect on product design, prompting design engineers to explore new ways to get their products to market.





Some of the key takeaways of the survey, conducted among 530 global engineers and made public on March 1st, are the following:

- 75% of respondents say access to electronic components is a significant challenge.
- 93% have experienced a major impact on longer lead times.
- Designers are seeking additional routes to source parts including spot market brokers.
- Most have significant concerns about counterfeit control.
- 64% say they are designing more based on availability of the components rather than preference.

Components access remains a challenge, and most of the survey respondents expect it to get worse

Seventy-five percent of engineers who responded to the survey said they face significant challenges accessing electronic components. Engineers in the telecommunications industry, in particular are feeling the strain, with 83% of respondents reporting significant challenges.

Among those who have experienced a significant impact due to the chip shortage, 93% say longer component lead times are the top challenge. Respondents also say they experienced major impacts in delayed production schedules (74%) and higher prices (72%). And while the specific impact varies by industry – those in the

Photo: Avnet

telecommunications, aerospace and electronics industry are most likely to see an impact on pricing, for example – there are consistencies, especially as it relates to future expectations.

And there are more challenges likely to come. Among respondents who reported delayed production schedules, 75% experienced a slippage of less than six months. But a strong majority of all respondents expressed concerns about lead times getting even longer and prices rising even higher (96% each) in the next year and a half.

Distribution partnerships add value beyond the Bill of Materials (BOM)

Engineers realize they must be flexible in approaching their designs from the start, hedging against the potential need to shift to alternative components and suppliers along the way. Designers must develop a deeper understanding of procurement and supply chains and become more closely aligned with those functions. Doing so will help engineering teams be ready to pivot quickly if necessary, ensuring their business is sustainable for the long term.

The automotive market is an example of how an established industry must pivot to stay relevant. There were approximately 300,000 EVs sold in 2020 and 35 million projected to hit the roads by 2030, according to industry estimates, driving a rapid pace of change. As EVs scale, we don't have the infrastructure to support charging them. This lack of EV charging capacity may delay EV growth.

The industry now needs to pivot and start building out the infrastructure, aided by the $7.5B in U.S. government funding recently approved for 500,000 EV charging stations. Getting there will consume even more of the available electronic component capacity available in the market.

That's where a strong, singular distribution partner really helps customers drive value through an integrated design approach. With one partner that can marry extensive design expertise with data-based insights, engineers can look beyond the board and select components in a way that enables them to stay flexible and agile, ready for whatever disruptions may lie ahead. **EP&T**

Peggy Carrieres, *global vice-president, sales enablement and supplier development at Avnet leads the Phoenix-based distributor's global sales efforts, championing global supplier engagement and development initiatives. In this role, she serves as sponsor of Avnet's technical demand creation strategy, and oversees global interconnect, passive and electromechanical (IP&E) product business units, solution-selling opportunities between business units, cross-region business migration, business intelligence and market research teams, and Avnet's customer and supplier feedback systems. https://www.avnet.com/wps/portal/us*

ROBUST HIGH POWER CONNECTORS ARE LIGHT, COMPACT

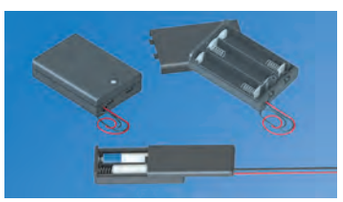
LEMO

M series high power connectors combine robust, light & compact bodies with new state-of-the-art gold-plated high power contacts. Accommodating cables from 10mm² (AWG 8) to 50mm² (AWG 1), devices come in various unipole & multipole configurations for single and three-phase requirements. Configurations were developed to satisfy the most stringent connection requirements for high power distribution of electronic devices and electric drive vehicles. Handling up to 430A rated current, devices deliver high power through small shell size connector.

https://www.lemo.com/en/products/new-connectors/m-series-high-power

COVERED BATTERY HOLDERS COME WITH ON/OFF SWITCH

EMX ENTERPRISES



Keystone Densi-Pak covered plastic battery holders include the option to have a built-in On/Off switch that eliminates the need for additional components in designs using 'AA' and 'AAA' batteries - suitable for self-contained powering components in a variety of applications. Devices are made with an ABS plastic case and nickel-plated coil spring steel contacts for a reliable, low contact resistance battery connection. Devices protect and secure the batteries within the compartment to prevent shorting or damage. Holders are supplied with 6" long #26 AWG tinned and snipped wire leads for simplified installation.

https://www.emx.ca

CONNECTOR BOOSTS SPEEDS IN SMALL FOOTPRINTS

FISCHER CONNECTORS

MiniMax Series ultra-miniature, rugged series of connectors, cable assemblies and electronic solutions has been extended to deliver more functionality and meet high-speed data acquisition and transmission requirements in applications with extreme limitations in space, even in harsh operating environments. Product series offers three connectors and the associated cables with options in pin layout, body size and data speed. Pin-layout configuration includes 7 contacts in 10mm receptacle, with a configuration offering up to 22AWG and a choice of three locking mechanisms.

https://fischerconnectors.com/en/solutions/connectors/minimax-series/

1A TINY, MODULAR CONNECTOR IS ROBUST, VERSATILE

HARTING

Han 1A connector series of 1A Miniature, modular rectangular connectors provides space savings, time savings and versatility granted by its miniature, modular, rectangular form factor with power, signal, and data capabilities and snap-in mating technology. Devices require up to 30% less space than firm's next smallest modular industrial connector, the Han 3A, and are made of robust, chemical-resistant plastic engineered to withstand rugged industrial and transportation environments, which also makes them lightweight and economical.

https://www.alliedelec.com/manufacturers/harting

HIGH PERFORMANCE HEAT SHRINK TUBING SERVES AEROSPACE

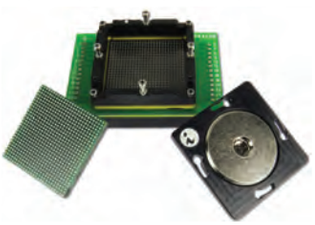
HELLERMANN TYTON

SE28 Series heat shrink tubing is designed to protect cable and cable harnesses from mechanical damage such as abrasion and resist a wide range of destructive fluids including diesel and aviation fuels, and fluids found in hydraulic systems. Made from cross-linked elastomer with an operating temperature range of -75°C to +150°C the ultra-wide temperature range makes the tubing suitable for applications across most motorsport platforms, and as with DR-25, SE28 tubing is qualified to VG95343T05D.

https://www.hellermanntyton.com/products/heat-shrink-tubing/se28-3.2-1.6/342-20000

BGA SOCKET'S ALUMINUM COMPONENTS DISSIPATE HEAT

IRONWOOD ELECTRONICS



GT-BGA-2175 BGA socket design uses high performance elastomer capable of 94GHz, low inductance and wide temperature applications. Socket is designed for 27x27mm package size and operates at bandwidths up to 94GHz with less than 1dB of insertion loss. Device is designed with aluminum components for heat dissipation and can be customized with fins and axial flow fan for further power dissipation. The contact resistance is typically 30 milliohms per pin. Device is mounted on the target pcb with no soldering, and uses very small real estate allowing capacitors/resistors to be placed close by.

https://www.ironwoodelectronics.com/products/sockets/bga-sockets.html

WATERPROOF REVERSE POLARITY CONNECTORS INCREASE OPTIONS

AMPHENOL RF

RP-TNC miniature sized TNC interface cable mount plug with an additional reverse polarity (RP) configuration is a straight cable mount plug suitable for the popular LMR-240 low loss cable and is engineered to meet all IP67 specifications in the mated and unmated conditions. Devices are suitable for industrial and military applications which require a more robust, secure RF interconnect. Products offer reliable electrical performance up to 6GHz while providing versatility in mating options with its secure, familiar threaded coupling mechanism.

https://www.amphenolrf.com

PLUGGABLE TERMINAL BLOCK PCB CONNECTORS INSERTS, REMOVES EASILY

OMRON

XW4M and XW4N Series 3.5mm-pitch push-in pluggable terminal block pcb connectors provide easy insertion and removal and high contact reliability because of its engagement structure. The wiring efficiency is improved with a hands-free mechanism that keeps the screwdriver inserted so the user's hands are free for cabling. Devices contribute to enhanced efficiency of inspection, assembly and maintenance. Devices also support compatibility with through-hole-reflow, which is good for reflow mounting.

Omron XW4M and XW4N Connectors

BACKSHELLS ENSURE A FULLY EMI/RFI SHIELDED CONNECTION

HARWIN

Gecko-Screw-Lok (Gecko-SL) series of lightweight, high-reliability (Hi-Rel) connectors provide horizontal backshells that ensure a fully EMI/RFI shielded connection for horizontal 1.25mm pitch board-to-cable connections. Two variants of these horizontal backshells are available. The first features rear panel mount lugs and the second is without them included. Devices are compatible with the Gecko-SL horizontal through-board connectors (with standard gender locking) and Gecko-MT mixed layout connectors (which have both power and data-carrying capabilities).

www.harwin.com

WIRE-TO-WIRE CONNECTOR PROTECTS AGAINST HARSH CONDITIONS

HIROSE ELECTRIC

DF62WP wire-to-wire connector series provides an IP67 equivalent waterproof seal between cable and socket or panel and plug. The crimped contacts and wire are easily inserted through the seals to complete the rugged and reliable cable assembly. Product has a multi-row pin layout arranged in a grid pattern that significantly reduces the size of the diagonal diameter. Utilizing a reliable two-point contact design, device delivers ruggedized connectivity that is resistant to shock and vibration.

https://www.hirose.com/en/product/series/DF62W

LOCKING SYSTEM DELIVERS SECURE CONNECTION

LIGHTHORSE TECHNOLOGIES

I-PEX locking connector system provides a secure connection and prevents unwanted disconnects. No more adhesive bonding to your circuit board. The locking system affords the application a strong connection to the mating printed circuit board connector. No more risk of adhesives contaminating the signal performance. The simple slide lock keeps the connectors mated under high shock situations. System makes for easy reconnections. Product provides a mated height between 2mm and 2.90mm maximum, with a frequency range up to 9GHz and 12GHz.

https://www.rfconnector.com/

M12 CONNECTORS ARE FIELD-WIREABLE

BINDER USA

Series 713, 715, and 825 field-wireable M12 connectors with cage clamp quick connection, serve as an alternative to screw termination - offering simpler installation that reduces exposure of cable assemblies. Series 713 (A-coded) is designed for signal and power transmission within the CAN, CANopen, Profibus PA (process automation,) and DeviceNet protocols. Rated voltages from 30V to 250V. Rated currents between 1.5A and 8A. Series 715 (B-coded) is suitable for Profibus-DP (decentralized peripherals) applications at 60V to 250V and 4A. Series 825 (D-coded) is designed for industrial data communication in Ethernet, Ethercat, Profinet and Sercos installations. Rated voltage of 250V. Rated current of 4A.

www.binder-usa.com

SUPPLY SIDE

DISTRIBUTION

TTI SIGNS DISTY DEAL WITH AMPHENOL POSITRONIC

TTI Inc. has reached an agreement to become an authorized distributor for Amphenol Positronic globally - offering a wide range of world-class, high reliability connector solutions for harsh environment, military and aerospace applications.

Positronic's D-subminiature, power, rectangular and circular precision connectors have solid, machined contacts and use the firm's PosiBand technology.

ELECTRO SONIC TO DISTRIBUTE ITG

ITG Electronics Inc., a leading manufacturer of inductors and transformers, has entered a distribution agreement with Master Electronics, as well as its Canadian subsidiary Electro Sonic.

The distribution arrangement involves the promotion of ITG Electronics' comprehensive lineup of inductors, transformers, chokes and other electrical components in the industrial sector.

ACQUISITION

LITTELFUSE TO ACQUIRE C&K

Littelfuse Inc., a global circuit protection component manufacturer, is set to acquire C&K Switches, an affiliated portfolio company of Sun Capital Partners Inc., for an enterprise value of $540 million.

Founded in 1928 and headquartered in Waltham MA, C&K is a leading global supplier of electromechanical switches and interconnect technology solutions for essential applications in industrial, transportation, aerospace, datacom products.

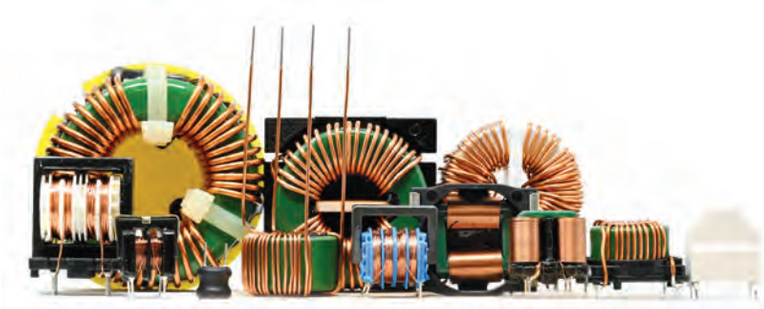
"C&K and Littelfuse share a common vision, with both companies having almost 100 years' experience in the design and manufacture of high-performance products," says Lars Brickenkamp CEO of C&K.

ICAPE GROUP ACQUIRES GERMAN PCB SUPPLIER

ICAPE Group, specialists in producing customized printed circuit boards (pcb) and technical parts, has strengthened its position in the European market with the acquisition of German-based player SAFA2000.

Founded the same year as ICAPE Group in 1999, SAFA2000 started its activities in the pcb industry back in 2007. In 2021, the company achieved a Euro $15.5-million revenue, with 28 employees and 360 active customers. According to Cyril Calvignac, CEO of ICAPE Group, the acquisition serves as a big step forward to develop ICAPE Group's businesses in Germany, with a new facility and a wider range of possibilities.

"ICAPE Group is well established in Germany. Our business unit recently moved to brand-new offices, we deployed more logistics solutions in Nuremberg, we invested in the acquisition of BA Elektroniks in 2021 and we are now moving forward with the acquisition of SAFA2000, which brings another experienced structure to our organization, with very interesting tools," Calvignac says.



SEMICONDUCTORS

AMD ACQUIRES PENSANDO SYSTEMS

Advanced Micro Devices Inc. (AMD), Santa Clara CA, has reached a definitive agreement to acquire Pensando for approximately $1.9-billion before working capital and other adjustments.

Pensando's distributed services platform includes a high-performance, fully programmable packet processor and comprehensive software stack that accelerate networking, security, storage and other services for cloud, enterprise and edge applications.

COGNIFIBER GOES TO EDGE WITH 'GLASS' PHOTONIC CHIPS

Cognifiber, a deep tech firm focused on revolutionizing photonic computing, has developed a glass-based photonic chip that will bring its technology one step closer to revolutionizing edge computing. Being the first of its kind, this glass-based chip reduces power consumption and takes a fraction of the size of previous designs.

Cognifiber is developing glass-based photonic chips that reduce its data centre rack-size systems to a mere 4U server (~18cm high), making it deployable in any office.

"The downsizing potential using glass-based photonic chips in conjunction with our proprietary fibers promises to bring superb-performance servers to the edge, removing many existing bottlenecks while dramatically reducing power consumption," says Dr. Eyal Cohen, co-founder & CEO of Cognifiber.

NEXPERIA UNVEILS NEW DALLAS DESIGN CENTRE

Nexperia recently unveiled a new design centre in Dallas TX, representing the firm's first R&D facility in North America, which will focus on the development of analog signal conversion and power management ICs.

"This new centre will enable Nexperia to expand and strengthen the analog IC portfolio, power management ICs and signal conditioning ICs," says Irene Deng, general manager business group, power and signal conversion at Nexperia, who will head up the new center.

Nexperia has ambitious plans for its new center and is aiming for a six-fold increase in the numbers of employees located there by the end of 2023.

SAFETY

BLACKLINE EXPANDS SAFETY MONITORING

In response to growing demand for employee protection and a one-stop solution to keep workers safe on the job, Blackline Safety Corp., a Calgary-based leader in connected safety technology, has announced a major expansion of its round-the-clock safety monitoring service.

The expansion includes growing the firm's Safety Operations Centre, an in-house safety monitoring service operated by a connected safety vendor, which operates 24-7, 365 days a year.

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Photo: Amphenol, ITG Electronics

PRODUCT SOURCE GUIDE

Huawei Watch 3

BY IFIXIT

These findings are from iFixit, the open source repair guide. The popular online site teaches people how to fix just about any electronic device, and sells the parts and tools to make it possible. For this teardown, the engineers at iFixit tackle the Huawei Watch 3. The smart wearable device comes with precision-polished stainless steel case and real inlaid minute indices. Using eSIM technology and all-day health monitoring, the device features a 4-day typical battery life, running off its own operating system – HarmonyOS.

Let's crack it open and see what makes it tick.

What's Inside?

- 1.43 inch circular AMOLED touch display with 466 x 466 pixels (326 ppi) and a 60 Hz refresh rate
- 2 GB RAM and 16 GB internal storage
- Updated sensor array with newly included temperature sensor
- 10 W wireless charging
- 5 ATM water resistance (50 meters)
- So far so good—let's dig deeper!

This model goes by the name GLL-AL04 and sports a digital crown and a side button.On the rear we can already spot four screws securing the back cover (a good sign!) but the tiny notch behind the top band indicates a slightly more... complex opening procedure.

FIG 1

- ***With the four rear Torx screws out of the way we finally cracked the clam open to reveal adhesive instead of a repair-friendly rubber gasket keeping the watch watertight.***
- ***Moving that cable out of harm's way and opting for a reusable rubber gasket would simplify the procedure.***

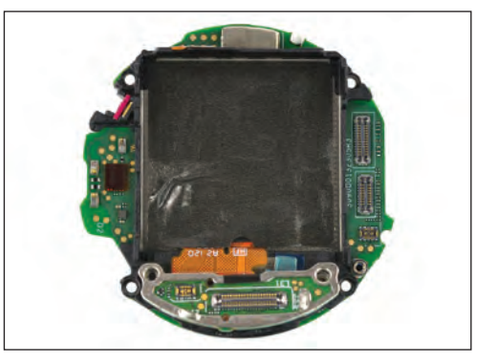

FIG 3

- ***With the motherboard out, we find the bottom of it rather... unspectacular at first sight. A big battery recess and all of the cable connectors set up camp here, but deeper down we spot some hidden chips:***
- ***CMJRD11G04G 16 GB NAND flash storage (likely) layered above maybe a WiFi processor***
- ***Ambiq Micro AMAP42 Apollo4 SoC***
- ***Runic RS7222 USB 2.0 DPDT analog switch (likely)***

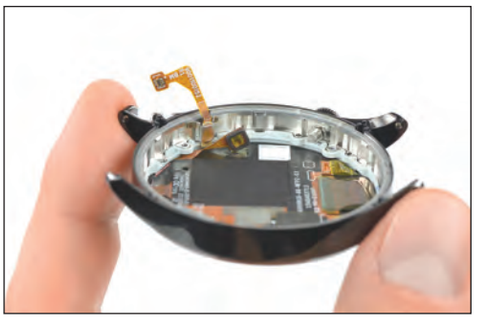

FIG 2

- ***After popping the watch open, more heavy-duty prying is required.***
- ***Most of the components in the sensor assembly are held in place by Phillips screws or brackets, and a couple rivets.***
- ***All our hard work yields only one replaceable part on the back cover—the loudspeaker. While optical heart rate and blood oxygen sensors are common in smartwatches, a temperature sensor is rather new.***
- ***With one more small bracket out of the way we have full access to the battery.***
- ***This powerhouse is rated at 1.78Wh (460 mAh @ 3.87V) and this battery, like many others, uses a classic soft-shell design. It makes us wonder why Apple seems to be the only manufacturer experimenting with metal pouch batteries.***
- ***The motherboard finally grants us a break from prying—a Phillips driver is all we need to free this board.***
- ***Motherboard out of the way, we turn to the 1.43-inch AMOLED screen and it's back to adhesive. That display is firmly adhered.***
- ***mockingly – the ambient light sensor is waving at us.***

FINAL

- ***All these glued and connected parts means we're left with a lot of big pieces, but at least the battery — which is guaranteed to eventually fail—is out of the watch.***
- ***Unfortunately we don't see that much evolution repair-wise from this series. Quite the opposite: more components crammed in and fewer that are independently replaceable.***

*These findings are from **iFixit**, the open source repair guide. The popular site teaches people how to fix just about any electronic device, and sells the parts and tools to make it possible. Anyone can create a repair manual for a device or edit the existing guides to improve them. iFixit empowers individuals to share their technical knowledge and teach the rest of the world how to fix their stuff.* ***https://canada.ifixit.com***

Photo: iFixit

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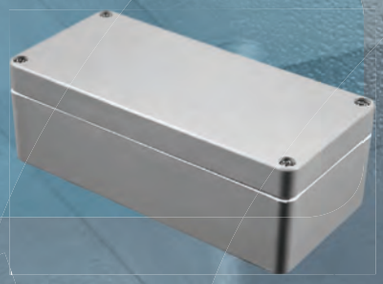
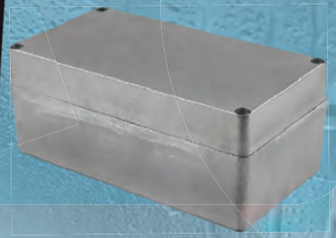


Industrial Wall-Mount Enclosures

Die-Cast Aluminum Enclosures



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