

MILWAUKEE ELECTRONICS NEWS

Q1 2021

About Milwaukee Electronics

Milwaukee Electronics designs and manufactures custom circuit board assemblies for the medical, transportation, military, logistics and a variety of other industries. The company has ISO-13485 medical manufacturing capability in its Portland plant.

The Company operates over 135,000 square feet of manufacturing in Portland, Oregon; Milwaukee, Wisconsin; and Tecate, Mexico. In addition to EMS and product design and engineering services, it offers PCB layout and DFM services through its San Diego PCB Design business unit and quick-turn prototyping and on-demand assembly through its Screaming Circuits business unit.

Organizational Changes Announced

In February, Jered Stoehr was named Milwaukee Electronics' Chief Executive Officer (CEO) succeeding his father, P. Michael Stoehr, who will serve in the role of Executive Chairman. P. Michael Stoehr has helmed the Milwaukee, Wisconsin based electronics manufacturing service (EMS) provider since purchasing the company in 1985. The younger Stoehr, a 19-year veteran of the company, previously held the role of vice president of marketing and sales. Rick McClain, President and Chief Operating Officer (COO), rounds out the three-member leadership team.

Jered Stoehr's accomplishments have included starting up the Screaming Circuits prototype and on-demand manufacturing business unit – the first e-commerce enabled electronics manu-



Executive Chairman P. Michael Stoehr

facturing organization in the world, opening an international purchasing office (IPO) for the company in Singapore and establishing

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Message from Rick

2021: A Year of Opportunities and Challenges

As we wrap up the first quarter of 2021 we see both opportunities and challenges. Our business model is attracting new clients across all



Rick McClain

divisions and some of those are cross-pollinating into larger opportunities. With increased availability of a COVID-19 vaccine there is now a stronger path to the return to normal we all want to see. That said, increased demand associated with that return to normal is creating material constraints and production challenges throughout our industry. Our investments in systems infra-

structure and an Asia-based IPO, combined with our engineering resources is helping us stay ahead of most of those materials constraints.

We've also announced organizational changes at the senior management level with Jered Stoehr assuming the role of CEO, while Mike Stoehr moves to an Executive Chairman role. This planned transition has been underway for several months now and organizationally we are continuing an evolution that aligns our service options more closely with the equally evolving needs of our market.

From an operations standpoint we are keenly aware of the need to be nimble in supporting customer needs. Our program management teams are working to identify material constraint risks in each project and address them as early as possible. Our

supply chain management team is closely monitoring trends and identifying other options where possible. That said, material costs are increasing and those increases will likely continue through the coming year.

The investments we've made and are continuing to make are helping us work smarter, automate processes, increase efficiency, improve overall customer experience and respond faster to schedule changes. We are committed to transparency in dealing with the constraints that we and every other EMS company are currently encountering. While the world hasn't returned to normal yet, you have our commitment that our team will do its best to minimize the impact of this year's challenges on every program.

Rick McClain
President

A Q&A with Jered Stoehr, Milwaukee Electronics' New CEO

Q: What's going to change now that you are CEO?

Stoehr: Milwaukee Electronics is a healthy, growing organization and I'm not looking to make significant changes in the business model that is serving our customers and stakeholders well. That said, I do want to see us become more nimble and responsive. One area where we will continue to invest is in systems strategy. In late 2019, we brought in a CIO consultant to do an in-depth analysis of our systems infrastructure. He put together a comprehensive, 3-5 year roadmap that we are now executing to. We've elevated our top IT role to a Director of Systems and Technology reporting to Rick McClain, and have added him to our executive team. We've recently overhauled our server and IT infrastructure and will be making announcements as our evolving capabilities in this area create benefits for our customers. Finally, there are also new regulations around information security that we are working to.

Q: Will there be any corporate culture changes?

Stoehr: I am completely aligned with my father's vision of an engineering-driven organization focused on building perfect products and treating all stakeholders with respect. Our business has grown in both size and complexity in recent years; we have over 700 employees and operations in four different countries today. To maintain our culture, we need to do a better job training and engaging our employees about



CEO Jered Stoehr

our values. We also need to do a better job of ensuring all employees stay up-to-date with the way our capabilities and processes are evolving. We've created a program called "The Milwaukee Way" for our employees which supports our business training needs, and also strengthens our values and culture. We continue to expand on this program as we grow.

Q: You have a long history of innovating in the area of customer experience. Will you continue to evolve that vision?

Stoehr: I've always felt that it wasn't enough to just deliver services to our customers. We need to deliver them in a way that makes our customers' jobs easier. When I started Screaming Circuits, I was basically creating a new prototype PCB assembly product focused on serving engi-

neers. We are now creating Choice-Production, a service that bridges the gap between prototyping and EMS volume production. Once we have matured the Choice offering to where it is an integrated part of our family of services, we will continue to innovate our services to ensure we are supporting our customer's changing needs. Organizationally, we plan to have a product manager that owns each of our core services, driving process improvements that add more value to our customers. We are now fine tuning our customer experience with support services like Web Chat to help them quickly find the service mix they need at a competitive price. Longer term, I want to make sure we are doing a better job of conveying the voice of our customers throughout our organization and drive results ownership to every member of our team.

Q: Milwaukee Electronics has expanded both geographically and in terms of service offerings over the last decade. What's next?

Stoehr: I think our next step will be to open a facility in a second low cost region. We are looking closely at India. We have had an Engineering Tech Center in Pune for 9 years already, and we are fortunate to have the right relationships to further expand our business there. Our goal is to ensure we stay one step ahead of our customers' wish lists in terms of the support we can offer.

Organizational Changes

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an engineering tech center division in Pune, India.

"Milwaukee Electronics is a family-owned company with an entrepreneurial spirit. My father will continue to have a role in setting our special business culture and values. We feel that being a family-owned business gives us a strategic advantage; as such we have been planning this transition for a number of years.

"Now is the right time to pass the torch to

the new generation and formally make the announcement. Rick and I have been managing the day-to-day operations of the company jointly in preparation for this change and we are extremely excited about our future," said Jered Stoehr, incoming CEO.

In his new role as CEO, Stoehr will be focused on growth and revenue activities, building on the successes he has achieved as Vice President of Marketing and Sales. Additionally, Stoehr will prioritize efforts

to improve customer experience, strategic partnerships, breadth of service and product offerings, and continue the entrepreneurial legacy of the business.

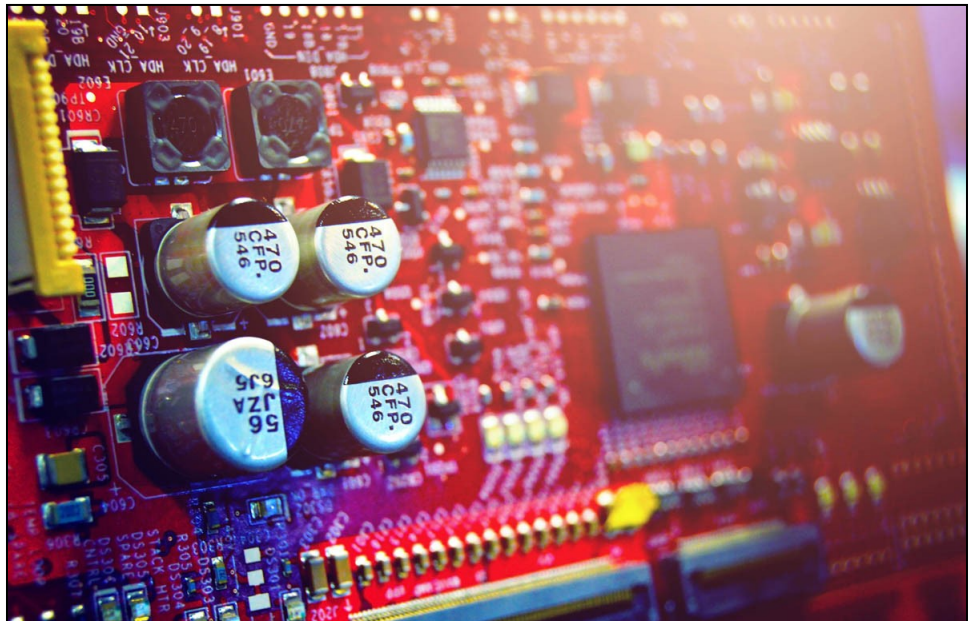
He received an MBA degree in Marketing and China Studies from the Hong Kong University of Science and Technology (HKUST) and the National University of Singapore (NUS). He earned his Bachelor of Science degree in Entrepreneurship from the Kelley School of Business at Indiana University.

Electronics Industry Experiencing the 'Perfect Storm'

The electronics industry is experiencing a 'perfect storm' of material and production constraints due to COVID-related production disruptions, uptake in demand within Asia, global 5G and EV initiatives, IOT growth, distance/remote working and learning infrastructure growth, and border delays and closures, as well as slow moving freight due to increased costs and lack of means to transport goods. And, unlike 2020 where supply chain disruption was balanced with drops in demand, many companies outside of these industries are experiencing spikes in demand as low interest rates and economic incentives motivate increased spending on major purchases.

Milwaukee Electronics' Supply Chain Management team is working hand-in-hand with program managers to address both materials constraints and unanticipated spikes in demand. There are also steps that customers can take to ease the situation:

- Provide information on new product builds as early as possible
- Avoid sole sourced parts on your bill of materials and approved material list (AML)
- Work with your program manager



Milwaukee Electronics' purchasing, engineering and program management teams are here to help.

- Approve substitutions quickly and be prepared to consider minor re-designs
- Consider ordering ahead on passives. Once the semiconductor shortage resolves demand for passives will ramp up.
- Costs are increasing at the commodity and component level, often

on short notice. Shipping costs and lead-time are also increasing.

Milwaukee Electronics is here to help with supply chain management and engineering expertise. Corporate Director Supply Chain Gary DeGrave publishes a monthly Supply Chain Bulletin outlining trends, specific component manufacturer updates and tariff activity. Past Bulletins can be accessed [here](#). All Milwaukee Electronics customers automatically receive an emailed bulletin monthly.

Forker Promoted to Corporate Director of Sales

Paul Forker has been promoted to Corporate Director of Sales. He joined Milwaukee Electronics in 2018 as Director of Business Development – West Region.

"Paul has been instrumental in Milwaukee Electronics' significant growth over the last three years and he was logical choice to lead our sales team now that I've assumed the CEO role. His extensive sales and EMS industry experience is an asset as we continue to pioneer ways to



Paul Forker

differentiate ourselves through innovative service models," said Jered Stoebr, CEO.

Paul was earlier associated with Fusion EMS, Electro Mechanical Technology and the Beams Company in sales, engineering and management positions.

Forker received his Bachelor's degree from Cornell College. He is also an IPC Certified EMS Program Manager (CEPM).

Milwaukee Electronics' Support Options Help Projects Evolve

A key difference in Milwaukee Electronics' approach to electronic manufacturing services is its ability to support transactional business during the product development stage via its San Diego PCB Design and Screaming Circuits divisions. Screaming Circuits has broadened its capabilities from Full-Proto to include Short-Run production and Choice-Production. The Choice-Production offering fills the gap that can occur at the point where manufacturing volumes are exceeding Short-Run production volumes but haven't yet reached the volumes and annualized production horizon typical in Milwaukee Electronics' EMS business model. It also offers a transactional option for production volumes that are larger than can be competitively-priced through Screaming Circuits Short-Run service from customers who aren't yet ready to make long-term commitments.

"Engineering teams in product development usually start at San Diego PCB Design for PCB layout or ordering prototypes through Screaming Circuits. But we are starting to see a lot of customers who like the idea of being able to get both services through a single company. Sometimes they start with layout and decide to add prototyping and other times they are introduced to our capabilities via our stoplight report which checks their Gerber files in prototype builds where potential issues have been identified," said David Carmody, Division Manager for San Diego PCB Design.

The services combination is also popular with companies who are scaling up production. For example, a new division of an existing aerospace/defense customer originally started with Screaming Circuits Full-Proto and initially planned to switch to Choice-Production to keep a transactional focus. However, the project scope grew during the quote phase to 26 assemblies, so the Choice-Production team



Customers have a range of choices in new product support.

recommended they move straight to EMS. Ten assemblies will be built in Milwaukee and the rest will be built in Portland.

In another case, a medical customer who was utilizing Screaming Circuits Full-Proto and Short-Run services to schedule production on an as needed, transactional basis, saw overall volumes grow to the point where those services were less cost competitive. The team is now quoting their projects as Choice-Production to improve overall pricing and if the account continues to grow, may quote EMS options, as well.

Choice-Production is also helpful for companies with a range of low volume needs. An engineering company that frequently uses Screaming Circuits on a transactional basis for Full-Proto and Short-Run is now using Choice-Production for scalability when projects grow beyond the point where Short-Run pricing is cost competitive.

"Often product development teams don't know which option will be best for them. Our ability to provide quotes that show the pricing for various volumes across all our assembly options is helping customers understand the economies of scale they can achieve as their volumes increase," said Kellie Schwab, Corporate Product Manager for Choice-Production.

Last year a web chat feature was added to

further help customers "who don't know what they don't know."

Web Chat Sales Support Specialist Jill Keppner runs the service. A veteran of customer service at Screaming Circuits, she understands Milwaukee Electronics family of services and is technically knowledgeable enough to help guide customers through different service options.

"Our model is very different from most of the options customers are used to. They love the idea of accessing a complete product commercialization solution through a single source. But in some cases, they are only familiar with the service option they buy most often. We've found that the ability to chat via the web or have a phone conversation is very helpful in giving them a better understanding of the benefits of our different service options and guiding them in the right service direction. I also help them understand the deliverables each group needs and answer any questions they may have," said Jill.

This consultative approach with a full range of support services for both product development and volume manufacturing is helping customers match the best service mix to their current needs while providing scalable, cost competitive support as their projects evolve.

Tecate, Mexico Facility Audited to ISO/IEC 80079-34:2018

Milwaukee Electronics' facility in Tecate, Mexico was recently audited to ISO/IEC 80079-34:2018. The audit verifies that the facility's ISO 9001:2015 quality management system (QMS) includes procedures required for manufacturing products used in explosive environments. The resulting IECEx/ATEX certification will be customer and product specific.

A program that involves asset tracking devices used in oil fields, production facilities and storage areas is launching in Tecate. The

IECEx/ATEX certification is necessary for products used in those environments.

IECEx is an international system for certification of equipment for use in explosive atmospheres. Its quality assessment specifications are based on standards prepared by the International Electrotechnical Commission (IEC). The objective of these IECEx standards is to maintain the required level of

safety while facilitating international trade in equipment and services for use in explosive atmospheres, by:

- Reducing manufacturers' testing and certification costs, and time to market
- Fostering international confidence in the product assessment process, and in the equipment/services covered by IECEx Certification.

Engineering in Action

Helping Power Grids Protect Themselves

Most of us have experienced power failures and the power on/off surges that can happen when the power is being restored. What is happening is that the power grid is protecting itself. When lightning strikes or vehicle accident create a fault in the grid, a recloser knife switch shuts down the damaged area while the system decides the best way to reroute power transmission to a different part of the grid.

Milwaukee Electronics' design engineering group has designed a control system for a 72kv substation electromagnetic recloser knife switch for power management company. The technology has worked well in the lower voltage end of the market and now being applied to an underserved portion of mid-to-high voltage segment of the market. The design engineering team pro-

vided electrical, mechanical, software and firmware engineering for the product. They are also supporting a very rigorous third party certification process through independent test labs. The control unit receives a communication signal to close and then interlocks to defined parameters. Intelligence on the control board also determines if the fire command is accurate and if the necessary conditions have been met for re-fire.

This project has not been insignificant because of the power involved. From a performance testing standpoint, the team needs to fire the switch, charge a capacitor back and fire it back. The power transmission is so large that the 400-pound electromagnet jumps off the floor

when the recloser switch is fired. That generates a lot of noise and heat.

Certification testing includes simulating lightning strikes and there are only two labs in the world that can do this. Only the lab in the Netherlands can test and certify. The team was required to be on call during the entire testing process to support any questions that lab personnel had.

The project started in the summer of 2020. The design engineering team has supported other projects for this customer and its product-specific knowledge was part of the reason for the project award. Initial feedback from the customer is that the unit has survived 10 lifetimes under test, which is better than anticipated.

Milwaukee Electronics Continues to Add EMS Customers

Two new pre-production programs are underway. The first is a telecommunications customer who has had a spike in demand that its current supplier can't fully support. A pilot run is underway.

The second project involves a medical instrumentation customer. A prototype run is underway and the project will go to volume production once the samples are tested.

Scott Pohlmann is the Director of Business Development associated with both projects and they are being built in the Milwaukee, WI facility.

Newsletter Contact

Paul Forker, Corporate Director of Sales

Email: pforker@milwaukeeelectronics.com

www.milwaukeeelectronics.com

Sales inquiries: sales@milwaukeeelectronics.com

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5855 N. Glen Park Road
Milwaukee, WI 53209
Tel: 877.960.2134