

MILWAUKEE ELECTRONICS NEWS

Q2 2019

About Milwaukee Electronics

Milwaukee Electronics designs and manufactures custom circuit board assemblies for the medical, transportation, military, HVAC and a variety of other industries. 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 services through its San Diego PCB business unit and quick-turn prototyping through its Screaming Circuits business unit.

FactoryLogix Implementation Enters EMS Phase II

Milwaukee Electronics is reaching some key milestones in its implementation of the FactoryLogix (FLX) manufacturing execution system (MES) in its EMS operations. (FLX) is at the core of Milwaukee Electronics' focus on increasing automated data collection. In Phase I of the implementation, Screaming Circuits and all three EMS operations were trained on creating NPI documentation and transferring existing documentation into the MES and paperless job books were set up for all three EMS facilities.

EMS implementation will shortly enter Phase II which integrates traceability and defect data tracking into FLX. Screaming Circuits has already completed this phase. Mid-July has been targeted for having the



Milwaukee Electronics is moving toward a paperless factory.

equipment, processes and training ready for EMS implementation. Given that customer notification and approval is part of

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Message from Rick

Operational Improvement Continues, Tariff Mitigation Options

As mentioned in Mike Stoehr's column last issue, Mike and I will be alternating columns to provide a mix of operational and strategic perspectives



Rick McClain

on our business. Operationally, we continue to execute on initiatives designed to improve our responsiveness, efficiency and quality.

We are about to begin the Phase II imple-

mentation of FactoryLogix manufacturing execution system in our EMS operations. This system enhances our speed in launching new projects plus automates traceability, data collection and analysis. The overall IT strategy we are implementing this year will significantly enhance the way we manage our business and our speed of response to customer requests.

We've added a new NPI Manager in Milwaukee who is part of an inter-facility team helping to design the next generation of our NPI process. This evolution is necessary to fully leverage the digital documentation and data transfer capabilities added by FactoryLogix. The goal of our new process is to be even faster in our ability to help our customers support their end markets.

Our facility in Tecate, Mexico is continuing to grow. We are pleased that the U.S. Mexico tariff situation appears to be resolved for the time being. I think it is important to note, that while large-scale migration of asylum seekers has impacted commercial truck processing times at some ports of entry along the U.S.-Mexico border, our facility is seeing normal hours and processing times at the ports of entry it utilizes. Mexico continues to represent a solution for mitigating component tariffs. In most cases, if our facility imports China-origin raw materials directly into Mexico and builds a product whose HS code transforms, it can be exported to the U.S. as a Made in Mexico product with no tariff liability.

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Engineering in Action

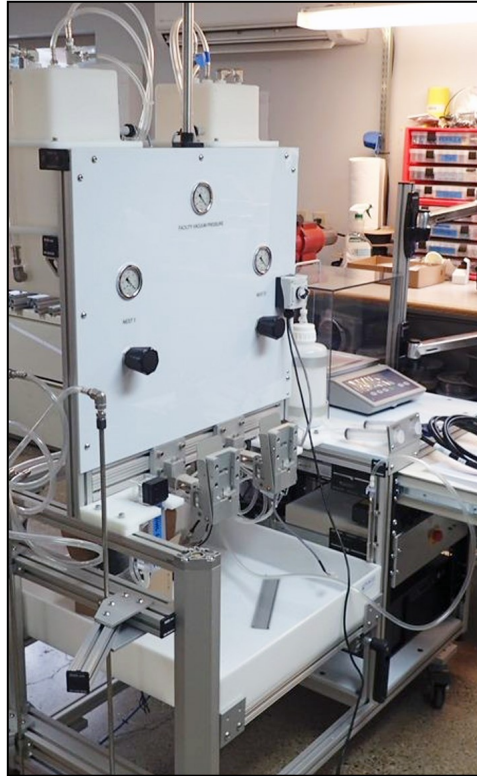
Test Engineering Group Turns “What If” Into Reality

Milwaukee Electronics’ test engineering group in Oregon has a reputation for being problem solvers.

“While we regularly work with our EMS customer base to optimize test solutions, we also have our own set of dedicated customers who rely on us to develop unique electronic or electro-mechanical test equipment,” said Brandon Loo, Milwaukee Electronic’s West Coast Engineering Manager.

For example, a team from a printer manufacturer wanted to test the speed at which their product’s ink left its cartridge. A standard syringe pump-based test didn’t have fluid dynamic transience capability to support a test requirement for a constant pull of a high volume of fluid while measuring the flow rate and extraction of the fluid by weight. Those measurements were new and difficult to do. The customer also needed accuracy down to the tenth of a gram.

Milwaukee Engineering’s test engineering team was able to support the requirement by reinforcing a propylene vacuum tank and developing a custom strain gauge load cell that could hold the required ink volume and measure



This ink life tester is on a moveable cart for easier maintenance.

over the entire range to a tenth of a gram. Multiple solenoid valves allowed the vacuum to interact and be drained in multiple ways. The system was interfaced with an off-the-shelf data acquisition deck that

interfaces with a signal conditioning board that isolates the DAC from higher voltages. The system also incorporated eight different sensors and custom mechatronics.

The test system achieved the customer’s test goals. Slight modifications to improve the user interface and the way test is managed have been made over time. The test units have been deployed in Asia and the U.S.

In another case, the team designed a life tester for ink cartridges by draining the ink into a water bath. The resulting tester is 4 ft. wide and 6.5 ft. tall. The team mounted it on a cart for easier maintenance. Over time the design has been modified to include a heads-up display (HUD) with a potentiometer control, a vertical actuator that puts a cap on the pen, electrical panel to support AC and DC motors, and cable/harnesses that can be disconnected. This added functionality gives operators more control over test parameters.

“Many of our design projects in this area start with a conversation with the customer about the tests they wish they could do. Our team’s expertise in electromechanical test equipment design helps makes those what-if conversations realities,” added Brandon.

New NPI Manager Named in Milwaukee



Chris Pakula

Chris Pakula has joined Milwaukee Electronics’ Milwaukee facility as NPI Manager. Previously, he was associated with Pentair as a project manager.

“Chris brings over 15 years of supervisory and manufacturing experience, plus strong leadership skills developed during his service in the U.S. Navy. He has already made a significant impact, not only tactically, but also in process development and deployment. He is working with his peers from Portland and Tecate in the development of our next generation of NPI processes,” said Clint Hanson, Vice

President of Engineering/Milwaukee Plant Manager.

Chris was earlier associated with Schoe-neck Containers, Axis Automation, Avon Highlife and Cargill Solutions in a variety of engineering and technical positions. He served four years in the U.S. Navy as an aviation technician and plane captain.

He received a degree in Business Management from the University of Ottawa and a degree in Automation Systems Technology from Waukesha County Technical College.

Milwaukee Electronics' Medical Business Increasing

Milwaukee Electronics has been awarded two new medical projects.

The Portland facility has also won a project involving a wearable cardiac monitoring device. The initial validation run was completed in May and is expected to ramp over the next two years.

"The Portland facility's ISO 13485 registration and ability to support both prototyping and volume production is attractive to medical customers in this region," said Paul Forker, Director of Business Development, Western Region.

Milwaukee Electronics' Engineering



Manufacturing expertise and ISO 13485 contribute to increasing medical business.

Team will shortly be building prototypes for a customer interested in improving the

patient transfer experience. The Engineering Team will work to customer specifications on the development of this design.

"This is an example of how Milwaukee Electronics' breadth of services fits our customers' needs. They started with us as a prototype customer in Screaming Circuits. Our San Diego PCB group now provides layout services, and now our Engineering team supports some of their design activities," said Scott Pohlmann, Director of Business Development, Eastern Region.

Scott added that Milwaukee Electronics' design and assembly expertise had played a key part in winning this project.

FactoryLogix

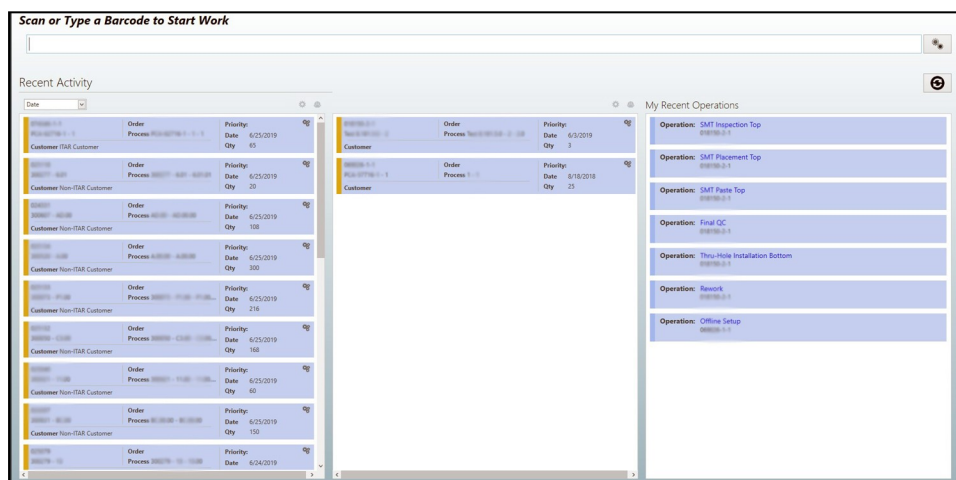
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this process in many cases, the timeframe for full implementation may push further into Q3.

When fully implemented in EMS, all printed circuit board assemblies (PCBAs) or PCBA panels in the case of units too small to carry individual bar codes will be labelled. This serialized tracking supports device history recordkeeping, defect data collection and tracking, processing cycle time tracking, and resource utilization tracking. The system also has the ability to warn or lock out operators when a process step has been skipped. SMT placement machines will also be providing data to FLX. This provides a more well-rounded view of production capabilities and capacity going forward.

Phase III involves aligning engineering support processes and will begin when Phase II implementation is complete.

"In the course of implementing FLX in EMS, we found that additional engineering processes needed to be updated or created when compared to Screaming Circuits processes, since volume production activities are typi-



FLX's user interface screen lets operators see upcoming jobs and recent work easily.

cally more comprehensively documented. The intent of this future phase is to catch up on any work that we missed in Phase I or II," said Bob Willenbring, Corporate Quality Director and Milwaukee Electronics' Executive Sponsor for the EMS portion of the FLX implementation.

FLX is one spoke of a centralized hub and spoke application messaging architecture at Milwaukee Electronics.

"Our goal is to ensure our third-party programs all have the ability to communicate with each other to ensure there is no need

to enter the same data into multiple programs. As factories become increasingly automated in terms of data collection, sharing and analysis, developing an efficient IT integration strategy becomes as important as having efficient production processes. Our combination of best-in-class third party applications combined with our proprietary hub software eliminates unnecessary manual transactions and improves the ability of our production teams to rapidly provide our customers with responsive solutions to changes in demand or schedules," Kyle Frank, Corporate Compliance Specialist.

Message from Rick

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Our team will be happy to quote that option.

We continue to look for ways to be the supplier our customers depend on for unique, engineering-driven solutions. Our Engineering in Action article shares some examples of our test engineering group's ability to turn brainstorming into reality.

Our team is committed to not only be-



Our Tecate, Mexico facility provides a China tariff mitigation strategy.

ing best-in-class in our segment of the EMS industry, we truly want to reinvent the business model by filling the gaps not well addressed by the traditional EMS model. If there is a way we can better serve your company, feel free to contact me.

Rick McClain

President

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