

MILWAUKEE ELECTRONICS NEWS

Q3 2018

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.

Milwaukee Facility Increases Large PCBA Manufacturing Capability

The Milwaukee facility's newest SMT line utilizes state-of-the-art inspection equipment and has been enhanced to facilitate the processing of large printed circuit board assemblies (PCBAs).

"We've been awarded a program by a mission critical defense contractor that requires the ability to manufacture larger footprint PCBAs to very rigid quality standards. The capabilities we've added to support that also support a wide variety of other large form factor applications," said Jim Dorsey, Manufacturing Engineering Manager.

One of the facility's SMT lines was retro-



The team has been running 32-in PCBAs with no problem.

fitted with Panasonic placement equipment in Q4 2017 to improve throughput and efficiency. That investment included a feeder cart system, PanaCIM software and DGS Data Creation System, and replaced older equipment with a Panasonic NPM-

(Continued on page 4)

Message from Mike: Investing in Success

This quarter's newsletter is highlighting ways we are investing to continue to meet the growing needs of our customer base.

Much of that investment is

focused on state of the art equipment to take advantage of the latest technical advancements in the industry. This quarter, new equipment has been installed in both our Milwaukee and Tecate facilities. To meet the increased volume requirements, we've initiated an expansion of our Tecate facility that will double the size of the manufacturing space and be completed in Q4.

Similarly, the staff infrastructure so im-



portant to support the manufacturing process has seen similar investment. We've created a Corporate Director of Continuous Improvement position that has now been filled and is functioning. Prior to creation of that new position, the addition of a Corporate Material Director position to better deal with the industry-wide material allocation issues, has proven to be visionary and critical to minimize issues for our customer base.

At the front end of the new product development process, PCB layout services, in our San Diego PCB division is also experiencing similar pressures of increased demand. Recent staff additions in Wisconsin, Minnesota, and our Phoenix office have allowed us to meet the tight schedule requirements developers are needing. The engineering design requirements that are a natural follow-up to PCB layout are also

stretching our engineering staff and have resulted in additional new resources being added.

All of these real examples underscore the current demand we are seeing and how we are investing to meet this demand. Our goal at Milwaukee Electronics, is to continue to be the company who fills gaps others miss in the EMS industry. If you are seeing any gaps in your service needs that we miss, please take the opportunity to mention that in our annual customer survey, which is being done in the month of October. We have conducted this survey every fall for 25+ years, as an igniter for items that need to be addressed when we begin our budgeting process for 2019. We covet your participation and comments.

P. Michael Stoehr
CEO



Bob Willenbring

Willenbring Named Corp. Quality Dir.

Bob Willenbring has joined Milwaukee Electronics as Corporate Quality Director. Previously, he was associated with Greatbatch Medical as Senior Manager, Quality and Design Assurance. He was earlier associated with Benchmark Electronics, JAE Oregon, Inc. and Alpkem Corp in various quality, engineering and production management roles.

“Bob brings over 30 years of experience in medical, industrial and electronics manufacturing services (EMS) engineering and operations experience. He understands the challenges of our industry and the regulatory requirements of our mission critical customers. He also has been involved with Lean manufacturing and continuous improvement efforts which aligns well with our organizational goals to better integrate quality data collection, operational metrics and continuous improvement initiatives via our systems investments,” said Rick McClain, Milwaukee Electronics’ President.

Bob received a Bachelor of Arts degree in chemistry from Reed College and a Master of Arts degree in chemistry from Portland State University. He has also completed certificate programs in Project Management and Advanced Project Management through Portland State University’s Professional Development Center.

Milwaukee Electronics’ IT Strategy is Transforming Its Business Model

One of the benefits of Milwaukee Electronics’ highly customer-focused model is that its service mix has been created around customer needs rather than the standard industry electronics manufacturing services (EMS) model. Its combination of conceptual engineering, PCB layout, quick-turn prototyping and EMS services have made it easy to develop niche solutions. The challenge is that some of those needs are quick-turn and transactional while others fit the more traditional long-term relationship EMS model.

Developing an IT strategy that efficiently supported multiple business units and locations was challenging because each business unit had unique needs and often unique IT infrastructure.

The Company’s IT evolution began with adoption of its Epicor ERP system in 2012. Last year FactoryLogix was added as a manufacturing execution system (MES). Investments in production equipment have taken a factory 4.0 approach by centering on equipment with the capability to communicate with other systems, laying the groundwork for better production-related data collection and production line optimization. However, these systems do not integrate seamlessly.

“I told people last year that by the beginning of 2019 we would be transacting business in a radically different way than we were doing back then. The changes we’ve made this year have laid the foundation for that transformation,” said Tim Benning, Corporate Director of Information Technology.

The Company’s IT strategy focus in 2018

has focused on four major areas:

- Increase overall speed and efficiency
- Provide appropriate levels of metric visibility to the individuals who need it
- Eliminate duplication of effort in data entry
- Increase automated data collection.

Network speed has been increased five-fold with the addition of a software-

defined wide area network (SD-WAN). This provides a fully encrypted, fully secured network that is optimized across all facilities and expanded to new locations with minimal effort.

The Company also migrated to a Microsoft suite of tools that includes Microsoft Office 365 and PowerBI. Power BI has been used to

deliver a powerful set of dashboards that are organized by function. Its reporting is instantaneous, providing team members with the data and metrics they need to perform their jobs. From a customer perspective, this tool will make it easier for program teams to rapidly update customers with project status information.

The metrics equation has been further enhanced with the adaptation of a platform originally designed for process development and automation in the software development industry. This platform is highly collaborative and is being initially deployed in the Screaming Circuits customer service team. It has a service desk and tools that replace traditional email with a system that tracks all communications related to project status and provides visibility to both the customer service team and customers. Customers will be

(Continued on page 3)



The team at Milwaukee Electronics is becoming more interconnected.

Organizational Changes Announced

Milwaukee Electronics has made several organizational changes designed to strengthen its company-wide initiatives and ensure strong leadership at the facility level.



Terry Martin has been named Corporate Director of Continuous Improvement. In this newly created position, he will be helping to drive Lean manufacturing

initiatives throughout the organization. Previously, Terry was the Milwaukee Facility's Operations Manager. Terry has been with MEC for over 23 years

and has served in a variety of management roles including engineering, quality, facilities and manufacturing. He also led the company through the initial stages of its lean journey. He received his Master's degree in Engineering Management from the Milwaukee School of Engineering.



Clint Hanson

was previously VP of Engineering & Opera-

Clint Hanson's role has been expanded to include responsibility for the Milwaukee facility. His new title is Vice President of Engineering/Milwaukee Plant Manager. Clint joined Milwaukee Electronics in early 2017 as Engineering Manager. He

tions at Granite Microsystems, a multinational, privately-held, embedded solutions provider specialized in engineered solutions for OEM capital equipment manufacturers.

"We feel it is important to assign responsibility for a critical process such as Lean/Continuous Improvement to a specific champion within our company. We migrated to centralized leadership of supply chain and quality for the same reason. Our goal in establishing these corporate-level positions is to ensure process consistency, leverage economies of scale and promulgate facility-level best practices across the organization. We've put specific focus on Lean manufacturing and continuous improvement in order to best capitalize on the efficiencies our systems investments can provide," said Rick McClain, Milwaukee Electronics' President.

Systems

(Continued from page 2)

able to check project status via a portal on Screaming Circuits website. The system is exception-based and will email team members when events occur that impact scheduling. This system also tracks a variety of performance metrics including order processing time, capacity, workload and on-time delivery.

"Our new toolset opens up new ways of interacting with and supporting customers in real time. Customers will still be able to interact with us on their terms, but behind the scenes we will have increased our ability to ensure we are providing a consistent customer experience. For example, capacity issues at all process steps will be even more visible than they are today," said Jered Stoehr, Vice President, Sales & Marketing.

Improved system integration will be achieved through the creation of a central hub which uses a hub and spoke application messaging architecture. In Milwaukee Electronics' IT model, the

spokes are the various third-party programs and the hub will be proprietary software that enables these programs to better communicate with each other. The hub development effort launched in Q3 2018. Once completed, it will eliminate the need to enter the same data into multiple programs.

The FactoryLogix MES is at the core of Milwaukee Electronics' focus on increasing automated data collection. All three EMS facilities have been trained on creating NPI documentation and transferring existing documentation into the MES.

Screaming Circuits is in Phase II of its FactoryLogix implementation which focuses on serialized tracking. Every printed circuit board assembly (PCBA) that is large enough to hold a bar code label will have a label added. The less than five percent of PCBAs that are too small individually to be labelled will have panel labels. Serialization 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 operators when a process step has

been skipped.

"These types of tools provide users with the ability to literally lock out products that skip a process step. However, the nature of prototyping often requires making process changes on-the-fly. We've opted for a warning rather than a full lock out to enable production operators to decide the correct next step. Serialization will also allow us to better leverage defect data to drive corrective action," said Kyle Frank, Corporate Compliance Specialist.

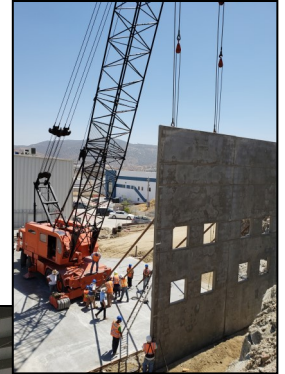
SMT placement machines will also be providing data to FactoryLogix. This provides a more well-rounded view of production capabilities and capacity going forward.

"From an IT perspective, it really is a new day at Milwaukee Electronics. While much of our early implementations have been focused on system and process improvements that weren't very visible to customers, the implementations we have done this year will change the customer experience significantly in 2019," added Stoehr.

Tecate Facility Expansion Is Under Construction

Milwaukee Electronics is adding a 24K sq. ft. expansion to its Tecate, Mexico facility. It will house the warehouse, ACG conveyor room and pad printing area.

Construction is scheduled to be complete in November 2018. The walls are up and electrical installation, air conditioning and ESD floor treatment are on schedule.



Large Board

(Continued from page 1)

W2 chip shooter and Panasonic NMP-W2 multifunctional pick-and-place machine. The line is rated to handle boards up to 29 x 21 inches, but the team has been running 32-inch boards with no issues.

In the current upgrade, the line's screen printer and automated optical inspection equipment have been replaced with newer equipment with advanced features and the ability to handle larger board sizes. Automated selective solder and x-ray equipment have been added.

The screen printer is an Ekra Series 8000 which includes automated solder paste

inspection which can handle boards up to 39 x 24 inches. The 3D Nordson AOI can handle boards up to 29 x 19 inches. The Hawkeye selective solder equipment has 3D vision for better accuracy and enables accurate soldering of through-hole parts with minimal solder usage and less thermal shock than is present when a wave solder process is used. The x-ray is a Nordson Dage Cerno 105L which can handle boards up to 36 x 28 inches. New board loaders, conveyors and totes sized to larger board formats were also added to minimize handling.

The Vitronics reflow oven remains the same. PCBA width is limited to 22 inches

maximum, but it can accommodate boards of up to 50" wide before zone crossover. Both of the facility's reflow ovens have eight heat zones and two cool zones.

This newer equipment also includes communications capabilities which will enable it to communicate with FactoryLogix once that system is upgraded to a full manufacturing execution system (MES).

"We are migrating from good systems to best-in-class systems in terms of technology. This lays the groundwork for stronger defect opportunity mitigation, real-time trends monitoring and greater efficiency," added Jim.

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