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ELECTRONICS ASSEMBLY IS ENTERING A NEW ERA. An age of increasingly complex package technologies, deeply integrated production lines and closed-loop data analytics. Our factories are becoming more intelligent, more productive and more versatile. And our organizations continuously demand new areas of expertise. Like our customers, we at Mycronic are determined to be a driving force in this transformation. And today I can confidently say that we are very well equipped to handle whatever challenges tomorrow may bring.

Over just the past year, our assembly solutions have expanded to encompass far more capabilities, applications and process steps than ever before. At Productronica 2017, I was proud to present for the first time a completely new product range, including the new MYPro series, MYSmart series and the recently acquired Vi TECHNOLOGY 3D visual inspection systems. The customer response was overwhelming. Not only was it our best attended event in years, but it also led to double the usual orders.

Yes, the enthusiasm had much to do with our new platforms. There was the fully software-driven MYPro automation line, with its minimal footprint and high-productivity jet printing and pick-and-place capabilities. There was the MYSmart series, an exceptionally cost-efficient portfolio of solutions for nearly any dispensing or conformal coating application. And in yet another new area for Mycronic, we also launched several of the world's most advanced 3D visual inspection systems.

But more than just the individual hardware, it is the sum of this new combined portfolio that I believe points to a bright future. With the welcome new addition of visual inspection systems, Mycronic customers now have access to a vast range of valuable new data. For some, the interfaces will be kept open to enable entirely new configurations, including pick-and-place and stencil printing. Others will take advantage of the integration with MYCenter to enhance current production with closed-loop analysis, real-time tolerance refinements and earlier correction of board errors. In the not-too-distant future, this enhanced intelligence will open up the possibility for manufacturers to approach a goal that was once unimaginable: the zero-defect production line.

As someone with a long history in factory automation, this is a thrilling prospect. With all of the new talent and expertise gained from our recent acquisitions, we now have a deeper and broader understanding of the production challenges you face as a Mycronic customer. I look forward to bringing all of this knowledge together to better serve your needs. And I hope you continue to join us in our efforts to create a more intelligent and productive future for our industry.

// Thomas Stetter
Senior Vice President General Manager Assembly Solutions

Worldwide events 2018–2019

NEPCON South China

Shenzhen, China

August 28-30, 2018

NEPCON Japan - Nagoya

Nagoya, Japan

September 5-7, 2018

Electronica/Productronica India

Bangalore, India

September 26-28, 2018

LEAP Expo 2018

Shenzhen, China

October 10-12, 2018

SMTA

Rosemont, IL, USA

October 16-17, 2018

ENOVA Paris

Paris, France

October 23-24, 2018

NEPCON Japan - Tokyo

Tokyo, Japan

January 16-18, 2019

IPC APEX EXPO

San Diego, USA

January 29-31, 2019

MYCRONIC

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One step closer to perfect

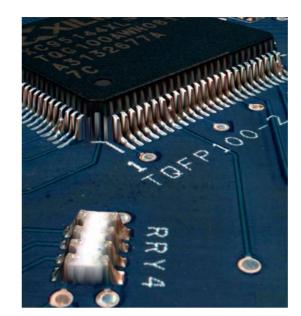
- introducing Mycronic's new fleet of state-of-the-art inspection solutions

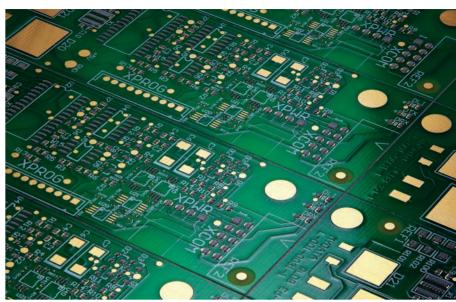
TEXT: GRANT BALDRIDGE PHOTO: VI TECHNOLOGY OPEN COMMUNICATION

What are your most common defects? And what would you save if you could catch them earlier in your process? Or even eliminate them from your design altogether? Mycronic's new line of proven 3D automated optical inspection and solder paste inspection solutions delivers accurate insights into any SMT process, making it possible to achieve new levels of perfection in quality, yield and process knowledge.









IN 2017, MYCRONIC ACQUIRED France-based Vi TECHNOLOGY in an effort to offer customers the world's most sophisticated closed-loop inspection system. Already used by top global manufacturers of aerospace, automotive and consumer electronics, Vi TECHNOLOGY's inspection solutions offered a uniquely integrated, accurate and scalable architecture - an ideal complement to the Mycronic 4.0 intelligent factory. Now, with the addition of the K series 3D AOI, PI series 3D SPI and SIGMA Link process improvement software suite to the Mycronic portfolio, the path from inspection data to actionable insights is shorter than ever before.

Advanced 3D Automated Optical Inspection

For most manufacturers, the value of highquality AOI is well proven. However, fewer realize the true possibilities of today's state-of-the-art inspection technologies, which combine pre- and post-reflow data to better predict and define the root causes of defects, inform real-time decisions and analyze complex process trends over time. Vi TECHNOLOGY has long been at the forefront

of this evolution, consistently leading the field with new innovations in high-precision metrology, inspection coverage and data analysis.

The K series 3D AOI system shows just how far this technology has come. By combining high-definition 2D texture with proprietary shadow-free 3D inspection, it ensures comprehensive component body and solder joint test coverage. This gives operators extremely reliable detection of misplaced components, lifted leads, tombstones and other defects, regardless of product geometry, warpage or board complexity.

To simplify programming and minimize fine-tuning, each high-resolution 3D image is stored in the industry-certified Library Pro defect image bank. Smart data visualization makes it possible to utilize this data to significantly reduce false calls and escape rates, whatever process or material is being used. Together these capabilities allow for continuous product improvement in the most demanding production environments, with uptime levels consistently above 99.5%. The result is a highly intelligent 3D AOI solution that can be scaled up to meet any future production needs.

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A breakthrough in SPI accuracy and simplicity

In another industry first, Vi TECHNOLOGY revolutionized solder paste inspection with the PI series 3D SPI platform – the world's first fully auto-programmed SPI unit. Unlike traditional SPI, the system uses a patented Z-referencing technology that captures extremely precise paste volume measurements on even the smallest pads. This amounts to hundreds of references

PI series 3D inspection platform is the world's first fully auto-programmed SPI.

across an ultra-large 50 x 350 mm 3D field of view, versus a collection of small croppedarea references around the pads, as with traditional solutions. This means that paste volumes are measured with unprecedented accuracy before pads are automatically grouped for easy improvement of process and tolerance settings.

"The latest PI series was a major achievement," says Olivier Pirou, CEO Vi TECHNO-LOGY. "Because the computation required to process these 3D images is massive, it took some of the most powerful commercially available GPUs, together with a team of top programmers from the gaming industry, to build the algorithms needed to sort through the noise and deliver useful, real-time visualizations."

"One look at the PI series is enough to understand how quickly this pays off on the factory floor," adds Allen Ouellette, Business Development Manager. "New customers see immediately how easy it is to use. There's no

keyboard and no mouse – just an intuitive touchscreen interface that calibrates the system with one touch. It's an elegant machine that programs itself with a single bare board scan. Anyone can set it up and run it with no more than an hour's training."

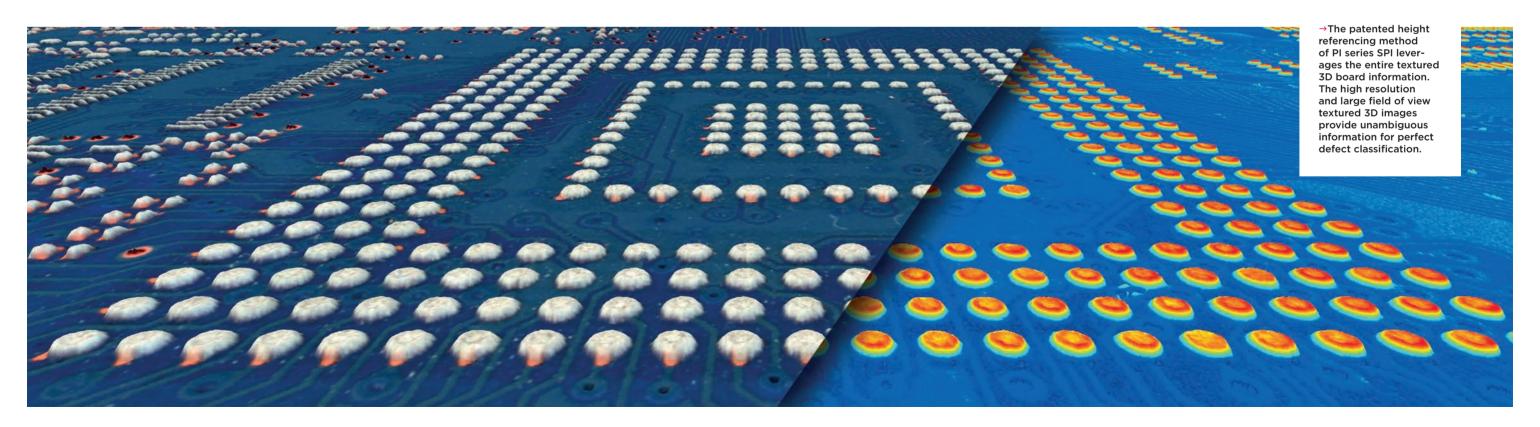
The industry's most advanced process improvement software

At the heart of the fully integrated inspection solution is SIGMA Link, a real-time web-based interface for unified SPI and AOI data. Through rapid data correlation and analysis, it gives operators a set of powerful modular tools for measuring, controlling and anticipating process variations. Possibilities include scalable in-line monitoring, easy diagnosis of the full PCB assembly process and complete traceability of data and images. Whenever a process gap or variance is detected, the user can easily drill down into process defects, take immediate corrective action and continuously improve yields.

Modules like SIGMA Live take this performance beyond the factory floor, enabling real-time remote monitoring and yield management while instantly highlighting process deviations and trends. SIGMA Line further expands test coverage and improves SMT line efficiency by ensuring that process control tolerances are optimized at all process steps. These and other software modules for import, review and more amount to a fully closed-loop inspection solution.

Turning AOI and SPI into rapid ROI

Of course, at the end of the day the entire industry is striving to create the perfect PCB. But not at any cost. So when it comes to the business case for inspection solutions, any ROI calculation really begins with a simple question: what is the true cost of a missed defect? If the answer involves multiple 01005s or BGAs, the cost of rework alone could be astronomical. If it's a system-critical board in the hands of a customer, it can be devastating.



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A new era in process control begins



Get the full power of **3D inspection with SIGMA Line.**

Zero defects. Perfect solder joints. No false calls. With the new SIGMA Line software module from Vi TECHNOLOGY, you get an automated optical inspection gatekeeper that guarantees the highest quality of every PCB. Based on extended functionality, SIGMA Line combines precision real-time analysis of inspection data from the award-winning programming-free PI series 3D SPI and the high-precision 5K3D AOI with its complete defect coverage. In short, one fully integrated solution for automated optical inspection to improve your SMT process and productivity.

Vi TECHNOLOGY is a member of the Mycronic Group.



"Years ago, I saw firsthand how a single lifted Add to this multiple software modules for lead could take down an entire piece of infrastructure - in this case, a telecom switch," says Max Fabiano, Key Account Manager. "Nowadays we apply a simple calculation to a defect's total cost, based on where in the process you catch it. If you detect it at SPI, it's manageable. If you de-tect it at post-reflow AOI, it's seven times more expensive to correct. Multiply that by 10 if you catch it in test, and ten again at the customer's site. That's a 700x cost that's entirely preventable with the right inspection tools."

In fact, the latest studies suggest that far more manufacturers could profit significantly from a full-line inspection solution. According to one Vi TECHNOLOGY industry survey, 61% of all SMT defects originated in the solder paste printing process and 17% were related to component placement. These figures suggest an urgent need for accurate measurement, control and prediction of process variations - particularly within SPI.

improved line efficiency, process control and yield management, and the value only continues to grow over time.

The future of electronics inspection

According to Thomas Stetter, VP Assembly Solutions at Mycronic, the new inspection portfolio points toward an exciting future for electronics manufacturers. "Mycronic has kept Vi TECHNOLOGY's successful R&D roadmap and added additional resources to it," he explains. "Now we are integrating with the Mycronic assembly process management solution and MYCenter, as well as collaborating externally to continue to ensure standard open interfaces for non-Mycronic customers. We look forward to expanding the original closed-loop architecture to cover more process steps, more use cases and more powerful process control tools in the years ahead."

> →SIGMA Link is a powerful software suite connecting SPI and AOI machines, creating a unified database with inspection data to easily diagnose and improve the PCB assembly process.



Space for growth

- how smarter storage is helping one award-winning CM rise to the top

TEXT: GRANT BALDRIDGE PHOTO: XLR8 SERVICES, INC MAGNUS ELGQVIST

In just five years, California-based XLR8 Services has gone from being an unknown contract manufacturing startup to winning the top customer awards for quality, responsiveness and technology at this year's IPC APEX EXPO. So how has their kitting room evolved to support both high performance and exponentially rising product volumes? We spoke with President. Owner and Co-Founder Jason Powell to find out.



→The market's most compact near-production storage system.



FAST ASSEMBLY, ADVANCED TECHNOLOGY

AND RAPID PROTOTYPING. For Jason Powell, the market niche for a new type of contract manufacturing service was clear. Especially in southern California, where new tech companies and innovative engineers were growing impatient for quick, high-quality results. Consumer products or defense manufacturers, one board or thousands – it didn't matter. Design cycles were shrinking fast. Testing never stopped. And everyone needed their boards in days, not weeks.

As an industry veteran with more than a decade's experience at two of the world's largest contract manufacturers, Powell foresaw a growing market need where others balked at the complexity. Together with an ex-colleague, he founded XLR8 Services with a determination to help customers turn ideas into designs, and designs into products, in record time.

Doing more with less space

Powell wasn't immediately interested in SMD Towers during the company's early years. "With just one line and plenty of space, we felt we could manage using a lot of racks and boxes," he explains. But as customer relationships evolved, expanding from just a dozen units to as many as 10,000 units per month for some customers, space became a critical constraint. Eventually the company had a decision to make: would they find a new, more compact kitting and storage solution or be forced to take on additional floor space in order to expand?

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In early 2017, XLR8 had decided to install their first SMD Tower, mainly to save space but also to support an additional Mycronic pick-and-place line. By this time, the company had grown to more than 30 employees with more than 100 accounts across all major market segments. A second SMD Tower, and then a third, were added in quick succession.

"I'll be the first to admit I was wrong to be skeptical in the beginning," continues Powell, describing how quickly he was convinced by his first SMD Tower. "As we grew, my mindset evolved...Today we have the same number of kitting staff, but revenue has more than doubled since the first tower was installed," he points out, explaining the efficiency of

the new material handling system. "Now we're about to add our third SMT line and have four towers in total."

Cutting down on kitting time

In addition to being able to handle double the volume with the same number of kitting staff, the SMD Tower setup has enabled XLR8 to achieve significant time savings. "For us a typical kit size is 80-100 line items," says Powell. "Before the towers, it might have taken a person two or three minutes per line item to go and pull them from stock. With the towers it takes less than 15 seconds per item. A several-hour job becomes 20 minutes."

It's this level of efficiency that has changed the way Powell thinks about the value of his kitting and component storage. "For business owners, it's easier to quantify the items that make you money - like your pick-and-place machines. The mental step that's often ignored, but is equally important is: how do you save money, time, space and staff? It all affects the bottom line."

An unexpected surprise

Another surprise came when Powell began to welcome customers into his new kitting room. "Customers just love it when they come in," he says. "They see a very high-tech and secure material management system that accurately tracks their components in a controlled environment. I never expected

it to be a sales tool, but every time I do a factory visit I make sure to show these machines. It's a huge selling point for us.".

For a company like XLR8 - which averages four to six kits per day, regularly does sameday builds and ships nearly everything else within three days of receiving the order - the value of the SMD Towers is clear. But what other types of manufacturers does Powell think should consider making the same investment? "Any place that's space constrained or spends a lot of time on setup," he responds. "But there's even more value in vertical integration. We could buy another brand, but when you have the pick-andplace equipment it's really a no-brainer. They just interface so efficiently."



JASON POWELL PRESIDENT, OWNER AND CO-FOUNDER XLR8 SERVICES

for us.



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Introducing the new MYPro series



The future of

intelligent productivity.



The industry's smartest high-mix line is now more versatile than ever

The future of high-mix production belongs to those who can mount any component on any board. Handle any batch or series with zero changeover times. And jet solder paste and adhesive deposits with high-precision at record speeds. The new MYPro series combines two of the industry's most productive platforms – the MY300 and MY700 – giving you more capabilities than ever before within a 40% smaller footprint than previous generations. Simply put, it's the smartest way to boost quality and utilization across a vast range of challenging applications. Whatever your ambitions, the future is already here. In fact, it's just in time.



→Preloaded Agilis feeder stored in SMD Tower.



Proactive replenishment

As an example, he points out the advantages of the SMD Tower for higher volume jobs. "They're nice and secure, and the inventory gets tracked. The machines tell us when we're running low on components, and the tower starts unloading the right reels... Now it's to the point where I can't imagine not having them. The guys in the kitting room just love working with them."

More growth ahead

Today XLR8 continues its rapid ascent, receiving top ratings from its customers in all types of defense, aerospace, medical and consumer segments. Powell expects to again double the company's revenues within the next 18 to 24 months. "Our future will hold several more of these towers," he says confidently. "The speed that we can grow will determine how soon we take the next steps."

For XLR8, it's the same mindset that got them where they are today: full speed ahead.

Our future will hold — several more of — these towers. —

How to set up a factory in your backyard in just a few hours

TEXT: DAVID GRAY PHOTO: NOKIA MAGNUS ELGQVIST

At first glance, it looks like any other shipping container. But peek inside and you'll find a fully automated, electronic assembly line using next-generation Industry 4.0 technology, including stencil-free jet printers from Mycronic. It's called "Factory in a Box," an agile new manufacturing concept from Nokia.

THE WHOLE IDEA behind "Factory in a Box" is to bring a vision to life by demonstrating a new business model for next-generation Industry 4.0 electronic assembly based on agreed industry standards. The initiative pulls together 12 reputable players, each providing various areas of industrial expertise, in an interconnected and flexible set-up that's easy to deploy and ramp up to scale – a win-win situation for all.

Factory of the future

"This initiative is fully in line with how we see the "factory of the future" – collaborative efforts using a fully automated software-driven solution with data collection, tracking across the production chain, and all the equipment talking to each other based on common standards," says Clemens Jargon, VP Global Dispensing at Mycronic.



The MY700 Jet Printer and Jet Dispenser



Dual lanes. Dual heads.

Twice the possibilities.



MY700 - Double your capabilities in jet printing and dispensing

The future of mixed production belongs to those who can handle any solder paste or fluid deposit with absolute precision and unmatched speed. Part of the new MYPro series, the MY700 Jet Printer and Jet Dispenser combines solder paste jet printing with jet dispensing of adhesives, UV materials, epoxies and more – with micrometer precision and at speeds of more than one million dots per hour. The unique dual-head, dual-lane design does it all within the same compact machine and process step, meaning there's virtually no board, package or component you can't handle. Whatever your ambitions, the future is already here. In fact, it's just in time.





Scaling up or down - instantly

"Today, with great uncertainty in the markets and the rapid introduction of new products, there is a growing need for flexible, reconfigurable and responsive manufacturing systems. You might need extra capacity during peak periods, want to do more prototyping around NIPs or face a shutdown due to natural disasters," says Jargon. "Now you can get a spare, portable factory that's ready to go. And with open interfaces like MES, you can run the entire factory remotely from a central computer."

Jet printing and dispensing technology

The "Factory in a Box" initiative was first introduced in 2017 at Nokia's Creativity Lab in Munich and later at the Hannover Fair in the spring of 2018. The decision to incorporate Mycronic's versatile MY700 jet printing and dispensing platform will allow manufacturers to handle a variety of solder paste or assembly fluid deposits with absolute precision and unmatched speed – without the constrains of screen printing.

Meeting new Industry 4.0 standards

"This project is yet another assurance to our customers that we're developing all next-generation equipment to be future proof and fully compliant with future industry standards. Actually, we have always developed our equipment and software based on open standards, so this is nothing new for us," explains Viktor Olsson, Product Manager of Assembly Solutions at Mycronic.

Handling regional requirements

Factory in a Box can be adapted to meet regional requirements or those of innovation startups. It can be as large as needed to meet build requirements by simply adding additional containers to the location. Having now achieved proof-of-concept in Europe, Nokia is rolling out this new business model globally in 2018.

There is a growing need for flexible, reconfigurable and responsive manufacturing systems.



Introducing the new MYSmart series

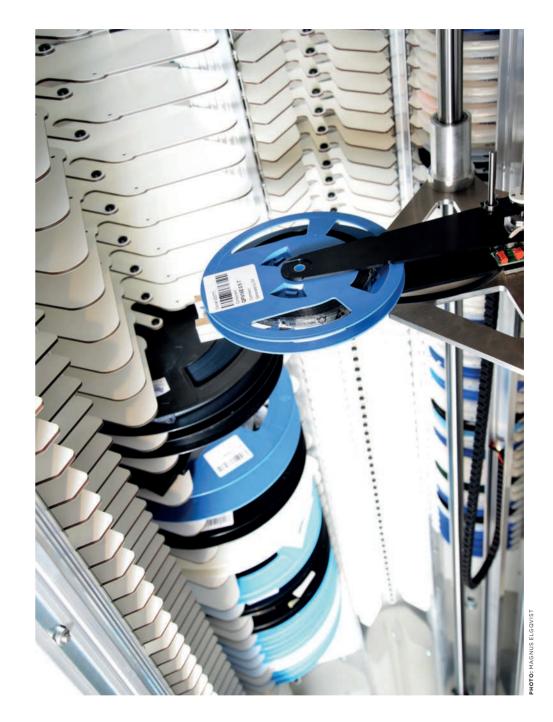


Smart dispensing made simple.

MYSmart series - enabling the future of dispensing and conformal coating

The future of electronics assembly belongs to those who can efficiently handle growing complexity, emerging package technologies and a wide range of dispensing media at ever-increasing volumes. The MYSmart series answers these rising challenges with a comprehensive range of compact tabletop dispensers and versatile in-line coating and dispensing systems. Underfill, silver epoxy or flux. High-speed SMA, glob top or solder paste. Film coating, spray coating or needle jetting. The MYSmart series handles it all with advanced standard features proven in the world's most complex, high-volume production environments. Giving you a complete selection of smarter, simpler, more accurate solutions – for whatever challenges the future brings.





The market's most compact near-production storage system

MYCRONIC HAS RELEASED the new high-capacity SMD Tower 8000 storage system, which builds on the success of its current 615 series. The SMD Tower 8000 is a compact, near-production storage solution that's been raised to 3 meters in height but takes up just 1.5-square meters of space. As a result, it allows a 17% increase in reel capacity (1,148 reels), compared to previous SMD towers. The vendor-neutral system can easly be integrate to any ERP and MES and represents the most compact and flexible solution available on the market. //

Mycronic extends the MY700 range with an **Extended Internal Conveyor**

THE MY700 JET PRINTER AND JET DISPENSER celebrates its one year anniversary with major software release adding a ton of functionality to the already broad range of applications the machine can handle. In addition to that, the MY700 is now available with an Extended Internal Conveyor which allows boards up to 915 mm long to be handled within the machine without the use of any external conveyors. This enables the jetting of boards in applications such as LED strips, backlight units and other applications where long boards are used. The MY700 is fully software driven which enables it to compensate for board warpage as it continuously monitors the board while running the job.

// Read more at mycronic.com.





Tray Wagon Magazine for MY300

THE POPULAR TRAY WAGON MAGAZINE (TWM)

is now available in a new, modified version compatible with the MY300 pick-and-place machine. The TWM is the ideal solution for prototyping and small series production, as it can hold a large number of tape strips or small trays on its easy-accessible pickup table. Programming the pickup position is quick and straightforward using the camera positioning mode in TPSys. The new TWM version comes in three different sizes, and it's easily installed on the machine using the standard CAN bus connection. //

New functionality in TPSys 4.2

THE LATEST TPSYS 4.2 Pick-and-place machine operating software includes several improvements that increase usability and performance.

- Traceability on PCB ID level can be activated individually for each layout, reducing operator intervention when running mixed production.
- Life-cycle management on machine programs hide non-approved or obsolete layouts.
- TPSys quiet mode less error messages when no operator action is required.
- Improved optimization will ensure that Hydra head utilization is maximized even in cases of late replenishment.
- Adaptive board positioning on MY300 board will be positioned for maximum throughput depending on head configuration.

All MY9-19E, MY100, MY200 and MY300 machines can be upgraded to version 4.2. //



Introducing the new MYPro series

THE FUTURE IS ALREADY HERE.

IS YOUR
FACTORY
PREPARED?

The new MYPro series - the perfect fit for any intelligent factory

The future of high-mix production belongs to those who can mount any component on any board. Handle any batch or series with zero changeover times. And jet solder paste and adhesive deposits with high-precision at record speeds. The new MYPro series combines two of the industry's most productive platforms – the MY300 and MY700 – giving you more capabilities than ever before within a 40% smaller footprint than previous generations. Simply put, it's the smartest way to boost quality and utilization across a vast range of challenging applications.

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