Speedline technologies

A proven high-performance printing platform - flexible, configurable, and easy to use, with speed and accuracy unmatched by any other printer in its class.

MPM® Momentum® Series

Printing System

A cost-effective, high-performance printing solution featuring innovative technology and outstanding capability.

MPM Momentum Series

Momentum: Thinking Ahead

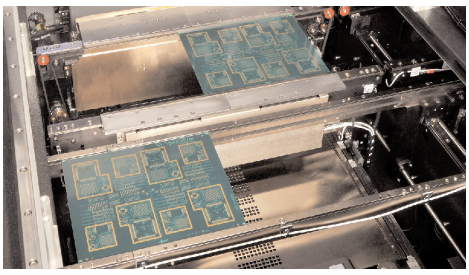
The MPM Momentum Series is designed to meet the ever-growing challenges of today's electronics manufacturing world: high performance, user-friendliness, space and operational efficiency and flexibility.

Repeatable Printing Quality for High Yields

Momentum is designed and built to be a no-nonsense production machine. Cost-efficient and featuring a modest footprint, it grows with the user; innovative patented features can be added on as needed or retrofitted as the user's throughput demands grow. Numerous patents protect the Momentum platform, which incorporates tried and true systems and features from other successful MPM printers that were designed prior to Momentum (and still in use today). Momentum's alignment repeatability is +/-12.5 microns @ 6 sigma, Cpk > 2. Its 6 sigma capability is designed in and independently verified. Wet print accuracy is 20 microns @ 6 sigma, Cpk ≥ 2. Tighter performance tolerances mean higher repeatability with fewer defects.

HiE (for High Efficiency) is a single-rail printer with servo motors, rather than stepper motors, driving the vision system's X, Y, and Z axes. Faster than steppers, servos drive the vision gantry at high speed and thus increase throughput and cut cycle time, making the Hi-E an efficient, high volume printer.

The Elite is the top-performer, offering the highest throughput and shortest cycle times. It's configured with a highly-efficient triple track rail system featuring an input buffer, a central processing section, and an output buffer.

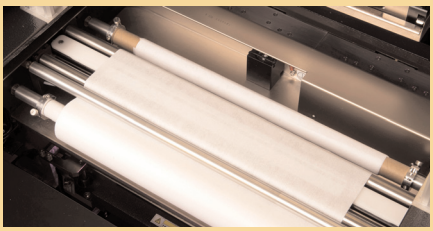


The Momentum Dual Lane printer configuration leverages all the advantages of dual lane processing to deliver fast, accurate printing of high volume products such as mobile phones, automotive assemblies, PCs and notebooks. Its industry-leading ability to process up to 12" wide boards simultaneously complements its patented unique software capability to switch over to full size board manufacturing (up to 24" x 20") in single lane mode. Speedline is the only manufacturer in the industry that can provide this flexible capability.

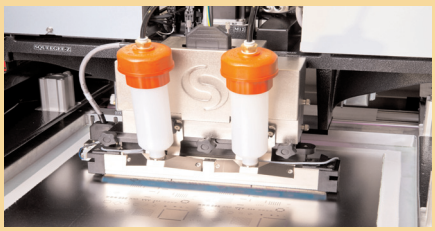
Momentum's Patented Technology

- EnclosedFlow™ Print System
- SPI Print Optimizer
- Camalot Inside
- EdgeLoc™ Board Clamping
- RapidClean™
- Auto Pin Placement
- Paste Height Monitor
- RapidView™ Inspection
- Benchmark™ 4.0
- BridgeVision®
- StencilVision™

Innovative Standard and Optional Features for Momentum Series Printers



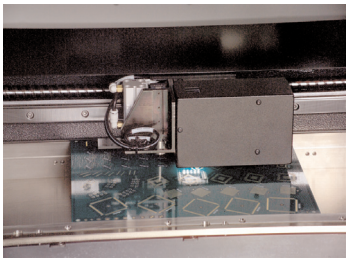
RapidClean
RapidClean is a high speed stencil solvent cleaning innovation that slashes cycle time and improves stencil cleaning performance, especially for fine-pitch. RapidClean reduces 3 wipe strokes to 2 and cuts cycle time by 5 – 6 seconds per print cycle over the standard wiper. And because fewer cleaning cycles are required, RapidClean can save up to $10K USD per annum in paper savings per printer.



EnclosedFlow
The MPM EnclosedFlow Print Head delivers uniform aperture filling and superb printing performance especially for fine pitch devices, with tremendous savings on solder paste over squeegee blade printing – in excess of 50% over blades for dramatically fast ROI. Print fine features such as 01005s and 0.3mm pitch CSPs with up to 50% greater volume and 25% lower deviation than metal blades.

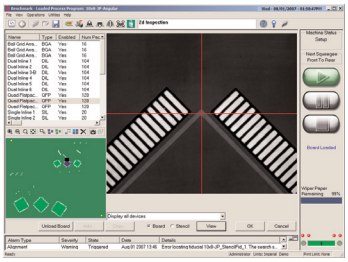
Camalot Inside
Only Speedline, with industry-leading core competencies in printer AND dispenser technologies, can bring both together to the customer's advantage. Camalot Inside consists of two dispense pumps integrated into one printing machine. Camalot Inside provides ultimate flexibility, allowing the dispensing of two different materials, or the same material (doubling dispense throughput speed) with two needle sizes to easily administer multiple dot sizes.

Patented, Innovative Features add Capability and Value to your Process



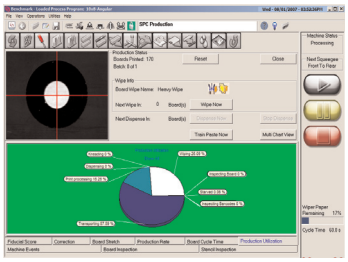
MPM Vision System & Inspection

MPM's patented printer-based Vision and Inspection system is a cost-effective way to verify print and paste deposit results. It's flexible enough to handle the complete range of today's most challenging components. This system measures the amount of paste covering the target pad and compares it with the required coverage. 2D Inspection is integrated directly into the stencil printer to provide an immediate source of data.



...With GerberEZ Teach

GerberEZ Teach makes the industry's most advanced inspection system more powerful and user-friendly. With its user-friendly tool bar and features like fast component identification, custom device, off angle, and device specific capabilities GerberEZ Teach makes 2D inspection programming a point and click routine.



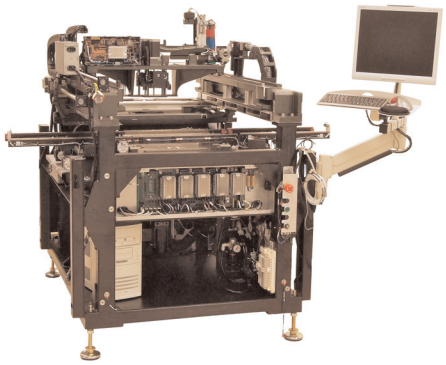
BridgeVision and StencilVision

BridgeVision is a patented method of analyzing bridge defects on circuit boards in the post-print inspection process. This innovative system utilizes texture-based image acquisition algorithms and a digital camera system with telecentric lenses to support the accurate identification of paste deposit defects. StencilVision utilizes texture-based technology to check the underside of a stencil for solder paste contamination. Wiper operation can be driven by the results obtained.

Momentum - Built on a Solid Foundation

Strength and stability are prerequisites for accuracy and precision when system parts are in motion and moving about at high speed. The Momentum's major assemblies are driven by precision ball screws, not belts, which eliminates the need for calibrations. The work nest and camera gantry are decoupled for optimum motion stability, shorter settling time, and faster board and stencil alignment.

CAN Control Drive Architecture supports faster processing speeds and the consequent overall reduction in wiring reduces Mean Time to Repair (MTTR). Momentum's rigid frame is welded for low vibrations. This allows for higher repeatability and great reliability over time. Board alignment is achieved with minimum table motion; thus the PCB travels to the stencil more quickly.



The Momentum series is designed with production needs and the needs of the operator in mind. They're champion performers, meeting the demands of high throughput and accuracy, yet at the same time are easy to learn, easy to use, and offer user-friendly features including built-in wizards in the Benchmark software program that provide direction for all machine functions, utilities, and error recovery.

Momentum: Features and Capabilities that Deliver Measurable Value

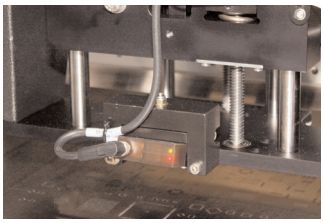
Real value can be measured in terms of yields. More good and reliable product with fewer defects. Momentum delivers high yields, and higher profitability through a very low cost of ownership and operational efficiency.

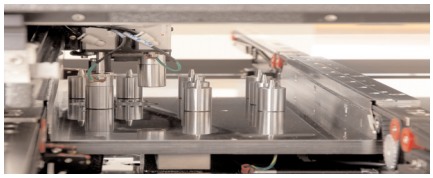
EdgeLoc Board Snugging

The EdgeLoc system securely holds the board during printing using a side snugging technique. Flippers engage to secure the board across the top edge, which ensures board flatness, and removes any warpage from the board. This technique delivers the best print quality and is the most adaptable system for the widest range of applications. A 'must' for thin board printing.

Paste Height Monitor

The Paste Height Monitor is designed to prevent defects caused by inadequate volumes of paste on the stencil. It combines advanced software and sensor technology to accurately monitor the paste bead for volume consistency. The sensor is mounted on the back of the squeegee head and measures solder paste bead diameter during the front-to-rear stroke. It's a non-contact solution that can automatically add more paste to the stencil as it is needed.



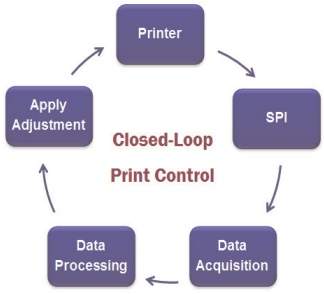


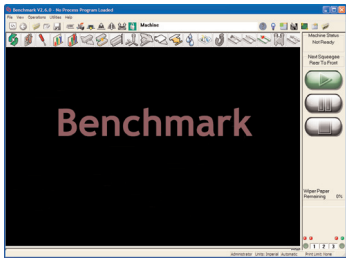
Auto Pin Placement

Automatic Pin Placement is MPM's patented tooling solution that uses the vision gantry to precisely place and remove tooling pins. The carousel holds 48 pins to match and support the largest board size. A standard grid for single sided boards or an exact pin placement for double sided boards can be developed.

SPI Print Optimizer

SPI Print Optimizer brings your Solder Paste Inspection (SPI) machine into communication with your MPM printer through a specially-developed common interface. When the SPI machine 'sees' X, Y and theta offset problems on a just-printed PCB, it analyzes the data virtually instantly and gives the printer instructions to correct those offsets, automatically, and 'on the fly'.





Benchmark 4.0 User Interface

Benchmark 4.0 operates with the Windows 7 operating system and incorporates the familiar Benchmark GUI and functionality, with added improvements in feature function that come from using Windows 7. 4.0 also incorporates a unique, empowering new Open Software Architecture, OpenApps (patent pending), that creates new communication possibilities for easy two-way communication between the printer and Manufacturing Execution System (MES).

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MPM MOMENTUM® SERIES SPECIFICATIONS

BOARD HANDLING	
Maximum Board Size (X x Y)	609.6 mm x 508 mm (24” x 20”)
Staging Mode - Momentum Elite	457 mm x 508 mm (18” x 20”)
A dedicated workholder is required for boards with an X size greater than 20”	
Minimum Board Size (X x Y)	50.8 mm x 50.8 mm (2” x 2”)
Board Thickness	0.2mm (0.008") to 5.0mm (0.20”), up to 6.0 mm (0.24”) without top clamp foils
Maximum Board Weight	4.5 kg (9.92 lbs)
Board Edge Clearance	3.0 mm (0.118")
Underside Clearance	12.7 mm (0.5") standard Configurable for 25.4 mm (1.0”)
Board Hold-Down	Fixed top clamps, centernest vacuum Optional EdgeLoc
Board Support Methods	Magnetic pins Optional Gel-Flex, vacuum pins, support blocks, patented auto-tooling or Grid-Lok

PRINT PARAMETERS	
Maximum Print Area (X x Y)	609.6 mm x 508 mm (24" x 20")
Print Gap (Snap-off)	0 mm to 6.35 mm (0" to 0.25")
Print Speed	Up to 305 mm/sec (12.0"/sec)
Print Force	0 to 20 kg (0 lb to 44 lbs)
Stencil Frame Size	737 mm x 737 mm (29" x 29") Adapters available for smaller sizes

VISION	
Vision Field-of-View (FOV)	106. mm x 8.0 mm (0.417” x 0.315”)
Fiducial Types	Standard shape fiducials (see SMEMA standards), pad/aperture
Camera System	Single digital camera - MPM patented look up/down vision

PERFORMANCE	
Total System Alignment Accuracy and Repeatability	±12.5 microns (±0.0005") at 6 sigma, Cpk of greater than or equal to 2.0*
Qualification is performed using production environment process variables; print speed, table lift and camera movement are included in the capability figure.	
Wet Print Deposit Accuracy and Repeatability	±20 microns (±0.0008") at 6 sigma, Cpk of greater than or equal to 2.0*
Based upon actual wet printing with positional accuracy and repeatability verified by a 3rd party measurement system.	
Cycle Time	
Momentum HiE	7.5 seconds standard
Momentum Elite	6 seconds standard

FACILITIES	
Power Requirements	200 to 240 VAC (±10%) single phase @ 50/60Hz, 15 A
Air Supply Requirements	100 psi at 4 cfm (standard run mode) to 18 cfm (vacuum wipe) (6.89 bar @ 1.9 L/s to 8.5L/s), 12.7 mm (0.5”) diameter line
Height (excluding light tower)	1638.4 mm (64.5") at 940 mm (37.0”) transport height
Machine Depth	1593.1 mm (62.72")
Machine Width	
Momentum HiE	1202.7 mm (47.35”)
Momentum Elite	1675.5 mm (65.96”)
Minimum Front Clearance	508 mm (20.0”)
Minimum Rear Clearance	508 mm (20.0”)
Machine Weight	
Momentum HiE	862 kg (1900 lbs)
Momentum Elite	899 kg (1982 lbs)
Crated Weight	
Momentum HiE	1155.5 kg (2547 lbs)
Momentum Elite	1192.5 kg (2629 lbs)

* The higher the Cpk, the lower the variability with respect to the process specification limits. In a process qualified as a 6 sigma process (i.e., one that allows plus or minus 6 standard deviations within the specification limits), the Cpk is greater than or equal to 2.0.

Specification is subject to change without notice. Please consult factory for specifics.

Speedline technologies

Knowledge in Process

An ITW Company

ABOUT SPEEDLINE TECHNOLOGIES

Speedline Technologies, a division of Illinois Tool Works, (NYSE: ITW), is the global leader in process knowledge and expertise for the PCB assembly and semiconductor industries. Based in Franklin, Massachusetts, U.S.A., the company markets five best-in-class brands — Accel microelectronics cleaning equipment; Camalot dispensing systems; Electrovert wave soldering, reflow soldering, and curing, and cleaning equipment; and MPM stencil and screen printing systems. For more information, visit us at www.speedlinetech.com.

Speedline Technologies maintains an ongoing program of product improvement that may affect design and/or price. We reserve the right to make these changes without prior notice or liability.