For Immediate Release

For More PR Information, Contact:
Gaye Jacobs, Power PR
P (310) 787-1940
F (310) 787-1970
E-mail: press@powerpr.com

A Holistic Approach to Mail Manufacturing Systems

The need for absolute accuracy in mail manufacturing underscores the importance of an integrated system in which every component works together seamlessly to achieve results that are greater than the sum of its parts.

Despite the rise of digital marketing, direct mail is still broadly utilized by many businesses like retailers, educational facilities, non-profits, real estate professionals, financial companies, healthcare, and political organizations to get their marketing messages out to target audiences. By delivering personalized, targeted messages directly to recipients' homes, direct mail provides a tactile medium through which businesses and institutions can create stronger, more meaningful connections.

Furthermore, recent advancements in data analytics and printing technology now enable the creation of highly personalized mail pieces tailored to individual consumer preferences and behavioral patterns designed to improve engagement and response rates.

However, this level of personalization makes it increasingly difficult to keep variable elements—such as inserts, envelopes, and cards—precisely aligned without errors. Addressing these complexities requires a holistic approach to equipment selection and system integration, ensuring that every component works together seamlessly to support accuracy, efficiency, and overall production quality.

"Taking a holistic approach means looking at a situation, system, or problem as a whole rather than focusing only on individual parts in isolation. The idea is that all components are interconnected, and the success or health of the entire system depends on how these parts work together," says David Loos of MCS, Inc, a company that designs, manufactures, sells, and

supports industrial inkjet imaging, tracking, and inserting systems and solutions for the mail manufacturing industry.

A high-volume personalized mail manufacturing system functions as a coordinated network rather than a standalone machine. Most systems are a combination of technologies from inkjet systems that employ different types of technologies and even inks, to inserters, card attaching systems, and tracking and cameras that verify printed information is correct, and that items are properly matched together. Software often ties the entire process together.

In many cases, the individual components that make up a system are supplied by different manufacturers, often located in various regions across the globe. When key technologies are sourced overseas, the primary equipment supplier may lack the in-house engineers or product designers to customize hardware or software, leaving little flexibility for modification or improvement.

While many components are built with integration in mind, assembling them into a unified, high-performing system requires careful coordination and is far from automatic. This is where system integrators play a vital role. Available through distributors or equipment manufacturers, integrators work to ensure compatibility and functionality across the entire process.

Alternatively, there can be significant advantages to working with suppliers that can offer a customized, end-to-end mail manufacturing solution. With this approach, organizations gain a cohesive system engineered from the outset for speed, accuracy, and scalability, backed by direct accountability for system performance.

“By owning and controlling the technology in-house, the company engineers can make changes or customizations as issues arise to provide a superior solution with full accountability for results from design to implementation to nationwide support,” says Loos.

Loos breaks down the component parts of a mass mail manufacturing system and provides examples of how, when integrated cohesively, they can work together to deliver superior results through a more holistic approach.

Inkjet Printing Systems

The foundation of modern mass mail manufacturing is the industrial inkjet system. These are not ordinary printers but highly specialized machines that can produce variable data printing at extremely high speeds. They support hyper-personalization by printing individualized text, graphics, addresses, and even variable barcodes on each piece of mail.

Different printhead technologies—such as piezo and thermal inkjets—can be employed, and inks can range from water-based dyes to UV-curable pigments depending on the substrate. High-end inkjets can run at more than a thousand feet per minute, even when every piece of mail is customized.

In mail manufacturing, the printing and personalization stage often relies on different types of inkjet technology, selected according to the requirements of each job.

For projects focused solely on addressing, a high-speed monochrome inkjet typically provides all the necessary performance. However, full-color applications require production-grade color inkjet systems designed to manage variable data efficiently at scale. In cases involving mixed-media production—such as combining envelope addressing with card imaging or individualized graphics—facilities often deploy multiple inkjet systems, each purpose-built and calibrated for its specific function.

Loos says MCS, for example, offers several industrial inkjet systems under different product families, intended for personalization, addressing, page printing, or envelope printing.

The Eagle series is a flagship line: for example, the Eagle 20 Inkjet Printer is positioned by MCS as ideal for high-speed addressing, tag printing, and barcode printing tasks. The Eagle 30 and

Eagle 40 models extend the throughput and drop-size options, while the Eagle 8530 / 8540 series target wider media formats (8.5″ width) with 600 dpi print quality at competitive speeds.

In addition, the company offers the Falcon line (which historically has been their HP-based addressing platform) for envelope addressing and versioning tasks. The Osprey systems (e.g. Osprey 26 or Osprey 72) are emphasized in the context of card-attaching lines and high-speed printing in mixed media lines.

For full-color or "process color" printing (i.e. four-color), MCS promotes the new Harrier and Condor as its process-color inkjet line and also Merlin K146c as a cut-sheet process-color press solution.

These inkjet systems often integrate with the system software and workflow tools to handle variable data, job layouts, drop size control, and color versioning.

High-Speed Web Presses

In some systems, large-scale high-speed web presses complement the inkjet units. These presses can print massive volumes of continuous-roll paper stock before cutting and finishing.

Web-fed industrial inkjet page printing systems can be integrated with continuous roll web configurations, essentially fulfilling many of the same purposes as a web press—namely, high throughput continuous printing—while adding personalization capabilities.

One product of note is the TK 500/1000 Inkjet Web System, which is engineered to work inline with existing web or bindery lines, flexo or offset presses, or as a stand-alone web-to-cut/fold/finish system. The TK 500/1000 supports simplex and duplex printing, variable drop size grayscale, and operates at speeds up to 1,000 feet per minute (fpm) depending on configuration. It is designed to interface with standard web finishing equipment (cutters, folder, unwind/rewind, etc.), so that printers can convert continuous roll stock into finished page or mail components.

Inserters

Inserters are machines that automate the process of folding, collating, and placing materials into envelopes. They are indispensable for transactional mail and marketing campaigns where multiple documents, cards, or flyers must be matched correctly with the right recipient envelope.

High-capacity inserters like the FlowMaster can process up to 12,000 envelopes per hour. They may also include verification add-ons to ensure every set of documents is correctly assembled and nothing is missing or mismatched.

There are also optional enhancements for inserters, such as OE (On-Edge) stacker options that allow for increased output stack capacity, automatic offset tray breaks, and labor reduction features.

Card Attaching Systems

When mail pieces require loyalty cards, membership cards, or promotional cards, card attaching systems are employed. These machines can affix single or multiple cards directly onto letters, brochures, or carriers. Some lines are designed with dual-stream functionality, doubling output by attaching two cards simultaneously at speeds of up to 20,000 pieces per hour.

Card attaching line systems integrate with the inkjet personalization and tracking systems to ensure correct matching between the card and its mail carrier.

Tracking and Verification Systems

Accuracy is paramount in mail manufacturing—particularly when handling financial statements, healthcare records, or other sensitive data. To maintain absolute precision, tracking technologies such as the Perfect Track suite monitor each stage of production from start to finish. These systems manage critical functions including match mailing, read-and-print operations, insert verification, and electronic double-detection. They also record detailed production data—operator credentials, machine IDs, piece IDs, and time stamps—and can even capture images of

individual mail pieces to verify compliance. This level of documentation ensures each piece reaches the correct recipient while keeping organizations fully prepared for audits.

The Perfect Track system is designed to deliver comprehensive output verification across the production line. Perfect Track supports key applications such as matching, read-and-print, insert verification, and electronic double detection.

The system accommodates up to 12 cameras and 48 sensor slots, with the capability to read 1D/2D barcodes, OCR fonts, and other identifiers. It integrates seamlessly with inkjet systems—including the Falcon, Eagle, Osprey, and Condor—as well as with inserters and tip-on equipment.

It operates in multiple modes, enabling tracking, matching, read-and-print, and output scanning across various machines. Optional modules expand functionality further, adding database logging (capturing time, date, operator ID, piece ID, and status), PDF audit generation, divert confirmation, and integrated read-and-print verification within the same production workflow.

Cameras and Imaging Systems

Cameras act as the first line of defense against production errors, scanning and verifying variable data on every printed piece to ensure accurate personalization. These imaging systems also perform integrity checks, confirming that inserts, cards, and envelopes are properly matched before sealing to maintain complete process accuracy.

There are a range of camera modules—such as MicroVision, C100, line-scan, and invisible IR models—within its tracking suites. Because MCS designs and manufactures all core components in-house, including cameras, tracking controllers, software, and inkjet modules, its architecture is fully integrated. This design allows tracking modules to be easily transferred between machines throughout a facility, providing exceptional flexibility and operational efficiency.

Software Integration Platforms

Underlying all the physical machinery is software that orchestrates the workflow. These platforms connect databases of customer information with inkjet systems, inserters, and verification modules. They manage versioning, drive multiple printheads, control personalization logic, and handle error reporting.

For instance, MCS' Raptor software can simultaneously drive different inkjet technologies, providing flexibility across print formats. Additionally, remote access and troubleshooting capabilities allow technicians to diagnose and resolve issues quickly, minimizing downtime.

Conclusion

A successful mail manufacturing setup works best when all parts of the process are connected and coordinated. When every part communicates and supports the others, accuracy improves, production speeds up, and errors are greatly reduced.

Taking this kind of all-in-one approach creates a smoother, smarter operation that can handle personalized mail and strict quality demands with ease. It turns a collection of machines into a unified system where everything works together for better results, higher reliability, and consistent performance.

For more information on MCS and their inkjet printing solutions, visit www.mcspro.com, call 800-728-0154 or email glenn.toole@mcspro.com.

# # #