

# BUILDING A STRONG SOFTWARE FOUNDATION

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Application Brief

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## Upgrade Machine Control to Streamline Automation, Prevent Obsolescence, and Ensure Ongoing Success

### SITUATION

In modern distribution and fulfillment (D&F) operations, where material handling equipment (MHE) and automation systems must be seamlessly integrated, establishing a robust software platform is essential for achieving long-term success. Machine control software serves as the foundation for these warehouse automation ecosystems, enabling communications and decision points among various components of a material handling system.

From managing print and apply machines and gap optimizers to general conveyance, merges and sortation, machine control provides a human-machine interface (HMI) to help end users operate their material handling system and perform key functions, such as:

- Starting and stopping of machine systems
- Providing system services and input/output (I/O) management
- Conducting material handling operations
- Troubleshooting and maintenance support

Machine control also serves as the foundational base layer upon which more advanced automation software can be added, such as a warehouse execution system (WES) or a warehouse management system (WMS).

But many programmable logic controls (PLCs) and machine control software — like Honeywell Intelligrated's ICW and BOSS — are in the sunset phase of their lifecycles. Not only will this make securing service and/or parts harder, but also prevents businesses from taking advantage of the latest breakthroughs in data storage and processing speeds. In addition, previous machine controls often relied on Windows-based servers, which are more costly to acquire and maintain. Enabling future compatibility with MHE and automation systems, as well as integration with more advanced WES and WMS software, will require upgrading to a more modern and robust machine control platform.

## SOLUTION

To support the next generation of warehouse automation hardware and software, Honeywell Intelligrated has developed a modern machine control solution within our next-generation Momentum software platform called MC4. MC4 is designed to give our customers a flexible and stable base layer upon which they can construct best-fit software solutions. It allows you to layer on additional Momentum WES and WMS functionalities or integrate with other equipment and software providers.

By building in these flexible, advanced and stable integration capabilities, we can help you to create tailored software solutions which leverage only the specific capabilities that your operations need — without introducing unnecessary system complexities or destabilizing your critical software infrastructures.

To help connect MC4 with the software layers above it, the Momentum software suite leverages a lightweight middleware layer called machine control business logic (MCBL), which is also referred to as Momentum Embedded Services.

MCBL receives instructions from MC4 to enable more advanced capabilities and perform basic equipment control functions such as: label printing, routing, alarms and events, data tracking and business intelligence (BI), history, reporting, visual status monitoring and host system communication.

## EXTEND YOUR CAPABILITIES BY ADDING WES AND WMS FUNCTIONALITIES

A core advantage of MC4 is its ability to integrate with the more advanced functionality available within the Momentum software suite. By adding WES and WMS capabilities to the MC4 machine control software foundation and MCBL middleware layer, we can help you to achieve your next levels of automation execution and fulfillment control.

While MC4 and MCBL provide a robust set of capabilities that can serve the needs of many D&F operations, Momentum WES delivers the advanced fulfillment and holistic automation tools needed to address escalating e-commerce complexities. At its core, Momentum WES is powered by Decision Intelligence, an advanced data science engine that processes real-time data — from machine controls, scanners, photo eyes and edge devices — and leverages it using artificial intelligence (AI) techniques and machine-learning (ML) algorithms.

By detecting patterns in live and historical data, Decision Intelligence enables proactive decision-making among automated systems to drive productivity and efficiency in all order fulfillment operations:

- Order management and fulfillment execution
- Workload balancing and resource coordination
- Intelligent, real-time order release, routing and prioritization
- Dynamic resource planning for the entire material handling system

As the capstone and top layer of the Momentum software system architecture, Momentum WMS is designed to support a variety of industries and D&F operations, such as: pharmaceutical, e-commerce, apparel, cold chain, third-party logistics (3PL), manufacturing and retail. From inbound receipt and order fulfillment processing to replenishment and outbound distribution, Momentum WMS provides seamless integration of essential workflows and key warehouse functions, including:

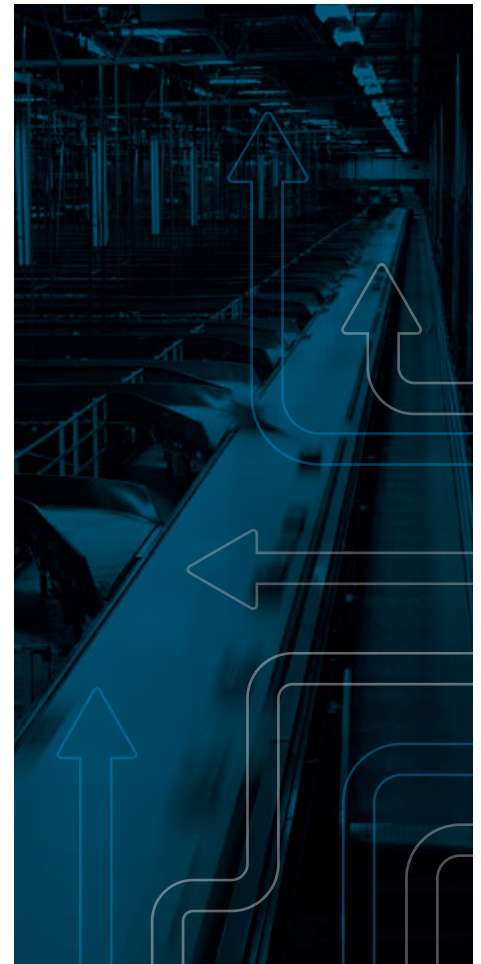
- Enterprise resource planning (ERP) and/or host system integration
- Inventory receiving and replenishment
- Real-time inventory tracking
- Order fulfillment
- Label printing
- Packaging and shipping
- Reporting and dashboard
- Transportation management integration
- Distributed order management integration

Both Momentum WES and Momentum WMS are designed with a modular infrastructure that allows you to add functionalities, automation technologies and fulfillment processes as needed. As a result, the Momentum software suite provides the configuration flexibility to continually adapt as your business grows to meet ever-changing customer demands or business requirements.

The Lifecycle Support Services (LSS) team from Honeywell Intelligrated can help to identify areas that need to be upgraded within your operation.

Our expert consultants and engineers leverage decades of project management and controls software experience to develop targeted automation solutions and software upgrades that meet your operational objectives.

Whether you need to upgrade your existing machine control platform or add Momentum WES and WMS functionalities, the LSS team can maximize the performance of your warehouse automation software to meet the increasing demands of e-commerce fulfillment.



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