Introduction

To thrive in today’s competitive landscape, companies look towards robotic automation which enables them to accelerate production while maintaining the existing workforce. Pentamaster Corporation Berhad is the leader in providing advanced manufacturing automation solutions and services to high-end technology companies in industries such as electrical and electronic, semiconductor, and manufacturing. The superior computing performance and reliability of Intel® Architecture enable Pentamaster to develop the Robotic Smart Assembly Solution (ROSAS), a modular automation system for applications in various industries. Typical applications are for assembly in the manufacturing and automotive industry. However, ROSAS can also be used in the food and beverage industry where food must be handled with strict hygiene and quality checks.

A single module in ROSAS comprises a robotic arm, a vision system, and a handler mechanism. Multiple modules are configured into an automation system according to the customer’s requirements. The automation system is controlled from a centralized industrial PC (IPC) powered by the Intel® Core™ i5-3610ME processor.

Deploying ROSAS in areas that involve performing repetitive tasks brings the following advantages:

• Consistent production and quality
• Optimum use of the capabilities of skilled labor
• Streamline operation and maintenance

Gaining Consistent Production and Quality

The food and beverage industry face the challenge of producing large quantities of food products on a reliable schedule while ensuring the food is assembled and packaged under strict guidelines. To meet these demands, the process to assemble and package the food products typically involves repetitive tasks, which is an area where robotic automation can offer the greatest benefits.

The mechanical nature and computerized control of the robotic arms in ROSAS enable greater precision and control over the production of the food products. Every step of the process—beginning from picking and placing items onto the conveyor belt to arranging and packaging the items—is performed precisely and accurately. This uniformity ensures consistent production output. Before the packaged food product leaves the conveyor belt, one final automated check via vision inspection is performed to verify that the food product is packaged properly.
Optimizing the Capabilities of Skilled Workers

Deploying workers to perform repetitive tasks is not an efficient use of human resource. These tasks are better performed by robotic automation systems such as ROSAS. The greatest value of skilled workers is their ability in making decisions, learning new skills, and using their creativity to either solve problems or to discover new and innovative ways to be more productive and efficient.

With the possibility of connecting multiple deployments of ROSAS in different locations to the cloud, workers in a centralized office could manage and analyze the flow of information such as the production output, inventory of the food items and packaging materials, and quality level of the production.

Supporting this connected infrastructure is Intel® technology. The IPCs in ROSAS are based on Intel® Architecture, providing dependable operation, powerful and energy-efficient computing performance, and a standards-based architecture that is able to run commercial off-the-shelf hardware and software.

Simplifying Operation and Maintenance

The use of robotic arms in ROSAS gives the system greater flexibility to adapt to changing requirements. A worker can configure the system from the central IPC to perform the production of different food products. The multi-axis robotic arms can be configured to handle food items in multiple angles and to dynamically pick and place items in bins from a distance or in close proximity. These advantages lead to the flexible implementation of robotic automation systems in the food and beverage industry where food products come in different shapes and sizes.

The robotic arms typically come from a single manufacturer. This simplifies the maintenance of robotic arms because spare parts are readily available. Furthermore, robotic arms are built with a modular design, allowing faulty parts to be quickly replaced and minimize delays to the production. The IPCs that handle the computing requirements for ROSAS—in the vision system and handler mechanism—are based on Intel® Architecture and uses off-the-shelf components. This allows faulty components in the IPCs to be easily and quickly replaced, and if necessary, components can be upgraded for better computing capability and connectivity.

Impact to the Business

Pentamaster recognizes the potential of robotic application in the industry, which in this example focuses on the assembling and packaging of food products in the food and beverage industry. The result is ROSAS, a modular automation system that uses robotic arms and vision systems.

Using Intel® Architecture provides Pentamaster the technologies to further innovate such as providing Internet of Things connectivity. This enables the potential for remote management and remote support for the automation system.

Investing in technology based on Intel® Architecture enables industries to explore new opportunities as they expand their business.

For more information on robotic automation based on Intel® Architecture, visit http://www.pentamaster.com.my/robotic/