



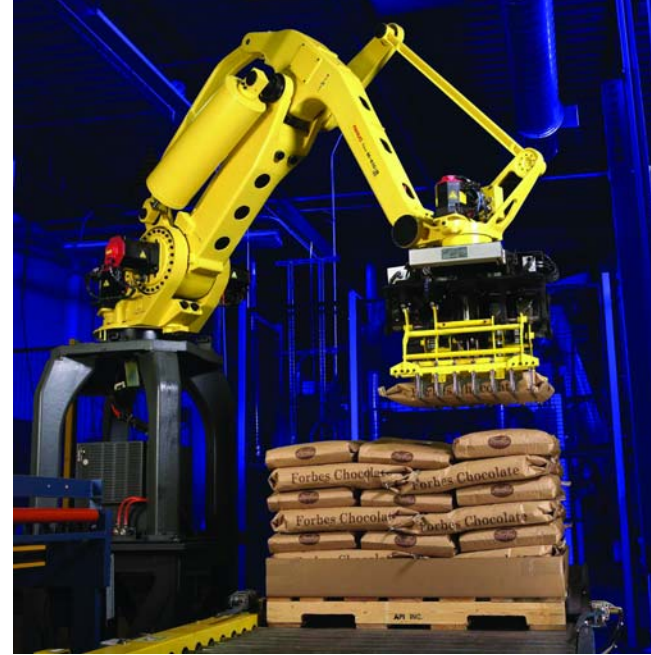
# Intelligent Robot Solutions



## **Application:** Bag Palletization System

**Industry:** Food

**Products Used:** FANUC Robotics M-410iB Robot  
Bag Handling End-of-arm Tooling  
In-Feed Accumulation Conveyor  
Pallet Accumulation Conveyor  
Push Button interface Panel  
PalletTool Software



The M-410iB robot is ideal for palletizing bags, bundles or boxes.

### **Challenges:**

After examining several options, this company chose to install a complete FANUC bag palletizing system to help increase efficiency and ensure repeatable quality. The company has a proud history in the food industry, supplying cocoa and flavorings since 1901.

When it came time to modernize, company management wanted to retain the quality of products provided by a small, family-owned business while upgrading their plant to meet current production and efficiency demands.

The facility had limited space available for palletizing automation, raising several layout design challenges. The robotic palletizing system needed to fit in an area restricted by existing equipment and had to allow complete access to adjacent aisles. The operators also needed easy access to other process equipment around the robot system as part of the plant's normal operation.

### **Solution:**

To address these challenges, FANUC Robotics provided a demonstration of the system prior to finalizing the proposal. The demonstration validated the proposed palletizing system as well as throughput requirements. Once the functional challenges were met, FANUC Robotics worked with the company to develop multiple iterations of system concepts to find an optimal configuration that met all of the process requirements with minimal disruption to existing processes.

FANUC Robotics supplied palletizing system hardware consisting of the FANUC Robotics M-410iB robot, bag handling end-of-arm-tooling, in-feed accumulation conveyor, pallet accumulation conveyor, and a push button interface panel.

The M-410iB robot is a high-speed, four-axis robot designed specifically for palletizing applications. The 160 kg payload version was selected for the application.

## Challenges *(cont.)*

The palletizing system had to handle four different sizes and styles of bags and accommodate changes in each bag's filled dimensions and firmness. The robot software program had to allow flexibility to easily adjust palletizing positions to quickly adapt to the wide range of bag variations.

In addition to all these variables, the system had to be capable of palletizing the product on two different sizes of pallets and fit different unit load heights. The pallet type and load heights were pre-specified based on individual customer requirements.

## Solution *(cont.)*

The main interface point for the palletizing system is through the FANUC Robotics *i* Pendant. The *i* Pendant has a multiple window color display, which allows input and adjustment of system palletizing parameters, and provides quick access to diagnostic and help information. In addition to the *i* Pendant, a limited function push button interface panel was also included. The operator uses the interface panel to signal the robot when a pallet is staged and the peripheral components are ready for automatic operation.

Based on the specific customer order, the operator uses the FANUC Robotics *i* Pendant and PalletTool software to select the appropriate pallet pattern, bag size/type and number of layers to be palletized.

The operator positions the appropriate empty pallet on the load end of the pallet accumulation conveyor and attaches a corrugated base to the pallet. Once the pallet is prepared, the operator pushes a button on the interface panel to indicate that the pallet is ready for transfer into the robot work envelope. The M-410*i* robot, powered by the R-J3iB Controller, signals the conveyor to transfer the pallet to the palletizing position where it is clamped to ensure consistent positioning for the palletizing process.

After passing through an upstream labeling operation, filled bags enter the robot work envelope. When in position on the in-feed conveyor, the robot picks up a bag and places it onto the pallet. The robot, which relies on operator input through the *i* Pendant, continues the palletizing operation until the unit load is completed.

When the load is complete, the robot controller initiates the transfer of the pallet out of the robot work envelope where it is removed with a forklift. The multiple zones on the pallet conveyor allow the robot system to transfer in a staged pallet and continue palletizing after the completed pallet is transferred out of the work envelope.