

# Innovative Packaging Solutions for Pharmaceuticals, Cosmetics, Medical Devices, and Consumer Goods

Application Brief (AB0442008)

Robotic Tray Loading

**Application:** Robotic Tray Loading of D-cell Batteries

**Products Used:** TaskMate Robotic Loader with FANUC M-6iB Robot



## The Challenge:

A battery manufacturer needed to update an automated system that loaded D-cell batteries into a variety of trays with several pack patterns. The customer required a single solution that would handle all of the required tray sizes. To minimize costs, the customer requested that the existing components for battery delivery, orientation, and accumulation be utilized in the design.

## The Solution:

ESS engineers designed a complete system that robotically loads a variety of tray configurations with eight (8) or 12 D-cell batteries. The final solution reconfigured existing equipment to integrate with a FANUC M-6iB multi-axis robot, a custom end effector, and programming to replace a SCARA robotic system. The new system handles multiple SKUs, increases production speeds and maintains fast, tool free changeovers.

## How it Works:

Batteries enter in a single infeed lane. The upgraded system includes a servo-driven tray indexing system, which divides the single lane into two lanes before entering the robotic cell. Preformed trays enter via the existing tray infeed conveyor. The batteries are reoriented for loading, and a vacuum style end effector picks multiple batteries and places them in the tray in the correct number and orientation. Full trays required two or three picks for full loading; in some configurations the system first picks and places a sensor card in the tray before loading batteries. Loaded trays exit on a conveyor to downstream packaging. Program options for tray loading include:

- 8-Pack Diamond Pattern (two rows of three and one row of two)
- 12-Pack or 8-Pack Family Pack (two rows of six or four batteries)
- 8-Pack Single Row (one row of eight batteries)

The tool-free size changeover consists of moving a single rail on the infeed and selecting the new size on an HMI, which uses Ethernet connections between the HMI, and the PLC. Discrete I/O allows the system to communicate with equipment downstream, and the HMI displays systems faults.

## The Results:

The installed system represented a significant equipment upgrade for the customer, increasing their line reliability and the production speed by 33%. By integrating existing components into the new line, the customer saved unnecessary equipment costs and reduced overall waste. As an experienced system integrator, ESS needed only three (3) days to remove the old system, install the upgraded robot, mount the existing components to the new system, debug and test the system and restore the line to full production. The system beat production expectations by 15% on the first day in service.



Robotic Cell for Loading Trays with Batteries



Batteries and Trays at Infeed



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