



Intelligent Robot Solutions



Application: Palletizing

Industry: Electronics

Products Used: S-420, HandlingTool Software



Six-axis S-420i easily handles heavy products.

Challenges:

After a day of heavy lifting, many employees in the shipping department of this manufacturer suffered from back strain and potential injury. With aggressive goals to solve ergonomic issues, maintain production rates and improve stacking repeatability, the company enlisted an engineering specialist to lead the search for alternative palletizing methods. "We evaluated several ideas, including dedicated palletizing equipment," said the engineer. This type of hard automation was ruled out because of its lack of flexibility. The team also considered repackaging some products to make them suitable for manual handling. However, repackaging was a costly undertaking which would make boxes less awkward, but still not relieve workers from heavy lifting.

It was decided that a flexible automated system would be the best way to handle palletizing the extensive line of lawn mower products. The system would need to be smart enough to handle the entire end-of-line operation, from random incoming product identification, to outgoing stretch-wrapped pallets. In addition, and without manual intervention, the system would be required to meet production rates of about one lawn mower every 16 seconds or one work bench every 10 seconds.

Solution:

The customer faced significant challenges at the end of its production line. In a typical day, over 1,400 units of cased product, weighing as much as 70 pounds each, rolled off the line and into the arms of an employee. To top it off, once a case was lifted from the conveyor, workers were required to twist and place boxes onto one of several pallets. While some cased products could be easily picked from the conveyor and stacked uniformly, many containers were awkward in size and shape, requiring additional lifting to form sturdy stacking patterns. In particular, the toolmaker's line of lawn mowers and work benches posed significant employee strain because of the products' large size and heavy weight.

FANUC Robotics Canada, Ltd. was selected to supply the automation. The customer provided valuable input throughout the engineering process, making the final solution a true team effort.

Solution *(cont.)*

The new automated system consists of an articulated robot, a robot end-of-arm-tool (EOAT) for handling the products, a PLC control system, bar code scanner, Norpak product conveyors, Wulftec pallet conveyors and automatic stretch-wrapper, and appropriate safety barriers. Overall project costs were reduced by utilizing existing equipment, such as conveyors, integrated by C.A.P.S., (Can AM Packaging Systems). Key to the system was FANUC Robotics' S-420i six-axis robot.

The S-420i family of robots offers payloads of up to 155 kg, and a state-of-the-art R-J Series Controller. The robot was outfitted with HandlingTool application software and an Allen-Bradley Remote I/O (AB-RIO) network connection. The R-J Series Controller, Allen-Bradley PLC controller and conveyor system successfully interact with the robot to meet production requirements. "The S-420i easily handles our product variations," said the engineer. "In fact, after working with the robot, we've found that its flexibility will allow us to handle production increases or future plant modifications."