

Robotic Palletizing - The Final Frontier

By WAYNE SPOONER

Palletizing seems to be the last area to be considered when reviewing your packaging needs. It's at the end of the line, assigned very little valuable floor space and a limited budget. Today, manufacturers have many choices to consider when looking at automated palletizing.

Conventional dedicated units (row formers), are an older, proven technology, but these require a considerable amount of floor space. Robotic palletizing technology has also been available for many years. It offers additional flexibility as well as many other advantages over the older technology.

Robots can handle more than one infeed conveyor and a variety of box sizes (depending on line speeds and pallet patterns). With a MTBF (Mean Time Between Failure) of more than 60,000 hours, robots offer high reliability yet they require very little maintenance. In general, robotic palletizing cells take up

less space than conventional units.

Robots do have their limitations relative to line speeds; typically 30-40 cases per minute (CPM) but higher rates are possible by picking up rows of product. Multi-function grippers, easy-to-use software tools, and functions such as asynchronous placement enable robots to create complex palletizing patterns easily.

Robotic cells also surpass conventional methods of palletizing in that they are able to lift heavier payloads, allowing a greater number of stable layers on the pallets. With this technology many of the high costs of work-related accidents, such as back strain and repetitive motion injuries are virtually eliminated.

Most robotic palletizing cells

consist of the following equipment. Each piece is as important as the next:

Robot

Motoman Inc. offers a wide variety of palletizing robots including 4- and 6-axis robots. Typically, 4-axis robots are used for palletizing. However, when greater reorientation of the box is required or floor space is limited, a 6-axis robot with a smaller footprint can do the trick. Payloads range from 80-600 kg with work envelopes ranging from 2-3.2 meters. Robots can be configured to

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A New Standard

By JANICE CLARKE

Add the Robotics Certification Standards Alliance to our growing list of satisfied customers. While the RCSA may not fit the mould of our traditional customers, they are an example of YMC's commitment to customize our products to meet any customer's needs.

Several years ago, Dan Thompson approached YMC eager to form

a relationship. He was impressed by the level of excellence in our facility, our training methodology and our robot technology on the whole. He knew it would form a stable foundation for what would soon be called the Robotics Certification Standards Alliance. The RCSA is an alliance whose mission is to increase the awareness of

automation, standardize robotic testing and meet the need for highly skilled employees. Manufacturing statistics predict that this need will continue to grow as more and more companies look to automate manufacturing processes. How can manufacturers fill this need for educated and capable

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Robotic Palletizing *(cont. from page 1)*

accept a 1-in 1-out, 2-in 2-out, up to 4-in 4-out. An optional robotic servo transporter can be used to handle 6 to 24 pallet locations.

Gripper

Motoman has many styles of grippers available. The most common is the vacuum gripper generally used on boxes, containers and some poly bags. In some instances both vacuum and mechanical grippers are used, depending on weight and load characteristics of the product being palletized (for example, liquid-filled containers or bags filled with contents that might shift during handling). Fork-like grippers are used for bags and tray products. By adding retractable forks on the end of the grippers, the robot can be used to pick up empty pallets, thereby eliminating the need for pallet dispensers. The same gripper can also be used to pick up slip-sheets, if required. Vacuum grippers can be designed with multiple zones, allowing them to pick up several cases at a time and drop them off individually or in specific groups, oriented as necessary (asynchronous placement),

Conveyor

The next piece of the puzzle is the conveyors. Typically, Motoman will supply the infeed conveyor to bring the product into the cell. Although this sounds relatively simple, this equipment is vital to ensure load stability. In order to achieve this, rolls are either skewed or a pusher is added to ensure the boxes are properly positioned for robotic pick-up. At the other end is either a stationary pallet locator or a powered outfeed conveyor. Motoman also offers empty pallet racks, slip-sheet racks and, if required, integration of stretch wrapping machines.

Off-Line Programming

Motoman has developed PC-based software (MotoPallet) that allows the end-user to generate pallet patterns off-line. This is a simple three-step process and will take an operator roughly 20 minutes to generate an interlocking pattern.

Application-Specific Palletizing Robots

Designed specifically for palletizing applications, Motoman's new EPL-series "Expert Palletizing" robots are a family of high-performance manipulators that feature a utilities management package with internally routed air and I/O signal lines, providing a unique, optimized method for connecting to the end-of-arm tooling that eliminates pinch points and potential interference. These application-specific robots are available in 160-, 300- and 500-kg payload models to meet a wide range of palletizing requirements. An economical, more compact 5-axis EPL80 model is also available.

PalletWorld Solutions

Motoman also offers fully integrated modular PalletWorld® palletizing solutions that include the robot(s), end-of-arm tooling, conveyor modules, and workcell protection.

If automating palletizing is in your future, give us a call and we will Pick It Up.

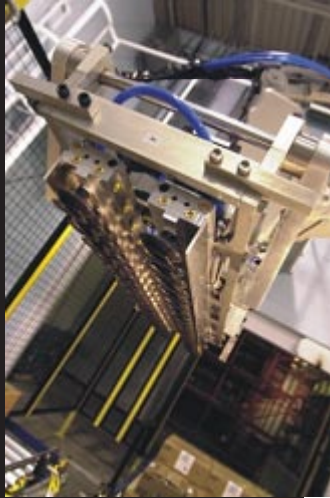
Wayne M. Spooner has been a Regional Sales Manager serving Eastern Canada and the Quebec region for the past 9 years.

Motoman Makes It Easy

In April of this year, Motoman hosted a three day technical forum for a contingency of integrators. Its purpose was twofold—to introduce the 2006 Integrator Program and to recognize fruitful partnerships.

More than 60 individuals from Canada and the United States joined with the Motoman sales force at the Annual Motoman Solution Provider Forum. The "Working With Motoman - That's Easy" theme was chosen to reflect this year's drive to make it easier for all of our partners to sell and use our products. Awards for outstanding achievement in innovation and sales were handed out in the evening of the second day. We are pleased to report that for the 15th consecutive year, Flow Automation won the Integrator of the Year Award based on high unit and dollar volume sales for 2005. Flow Automation's head office is located in Burlington, ON, Canada.

If you received an invitation, yet were unable to attend, please feel free to contact our Aftermarket Department. They'll be glad to fill you in on what you missed!



*Yaskawa
Motoman
Canada Ltd.
is pleased to
announce
our:
10th
Anniversary
Celebration
on
Sept. 20, 2006*

*Guest Speakers,
Technical
Forums, Product
Demonstrations
and More...*

Invitations to Follow

Audits vs. Preventive Maintenance

Audits and preventive maintenance are two plans developed for customers concerned about preserving the investment in their robotic equipment. They are not interchangeable plans, as each plan was created to address entirely different situations.

An annual preventive maintenance plan includes a simplified diagnostic check and the minimum required maintenance for your robot. It can take a qualified technician anywhere from two to five hours per robot to complete and is appropriate for any robot at any stage. An audit on the other hand, includes a more extensive diagnostic check of the equipment without actually doing any of the repairs. It can take just as long to complete and will require sophisticated tools and software. It is most often used to judge the status of robotic equipment prior to redeployment and will include repeatability tests to ensure the robot is operating at peak performance. Both procedures will provide a comprehensive report based on findings.



Feel free to call 905.569.6686 and ask for Brian Smith for help determining which maintenance plan is right for you.

A New Standard *(cont. from page 1)*

programmers? It all starts with training. "Colleges are not always the best choice for robotic training," Thompson explains. "The number one training in the world is training performed by the manufacturers, i.e. direct training as opposed to third-party training." Not only that, but colleges sometimes have difficulty changing curriculums mid-stream to keep up with the ever-changing standards. We won't have that problem. We offer "of the moment" training so that our students will be trained on current equipment.

After Thompson explained what his goals were, YMC and its team of instructors were able to customize the courses to meet their requirements. While most people who attend the YMC Technical Education Centre are manufacturing employees or robot operators, the RCSA will be catering to a different population. Our courses had to be tailored to appeal to a particular crowd with a particular knowledge base. The RCSA will do their own testing in order to meet vendor neutral standards. Prospective employers can then be confident they are getting a certain calibre from the resulting pool of students.

The Robotics Certification Standards Alliance anticipates an enrollment of 720 students within the next 12 months.



Upcoming Courses for Motoman Strategic Partners (MSP's)

MotoSim EG

The Yaskawa Motoman Canada Technical Education Centre will be upgrading the MotoSim EG course to reflect the newest version of MotoSim, MotoSim EG.

Our standard MotoSim EG course of 4.5 days will be offered starting in early fall. Meanwhile, to accommodate requests from our MSP integrator partners, we have added shortened and accelerated MotoSim EG courses to our schedule for the following dates:

June 28 - 30, 2006

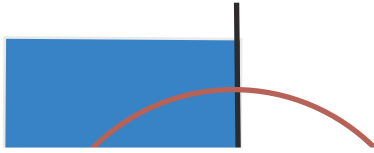
July 19 - 21, 2006

XRC REFRESHER

For those MSP integrators with limited Motoman training, an XRC REFRESHER course will be offered July 17-18, 2006. For more information on these courses, please contact your Regional Sales Manager or Elaine Higgins, Training Coordinator, at 905-569-MOTO. (905-569-6686)

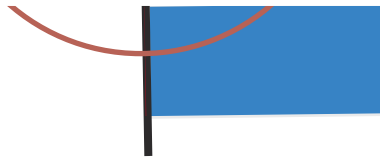


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Programming Tips

What is the best way to program my Motoman Robot?

BY JOHN SCIME

This question gets asked more often than you think. While there are no fast rules for robot programming, there are some fundamentals that must always be kept in mind when developing a program.

Keep it Simple

Remember, after the robot is programmed, there may come a time where modifications or additions will be required and you may not be available to do them yourself. Try to develop your program in such a way that other technicians will be able to sort it out in a timely and efficient manner.

Minimize Use of Position Variables

Use these variables only when necessary (Such as when a program path requires displacement when cameras are used). Position variables are tied to tool files and/or user specified coordinate systems. Unless specified, position variables are global and their values can be inadvertently changed by commands

in other programs which will cause the robot to move to unpredictable positions. Any changes made to tool files will also cause unpredictable motion.

Use a "MASTER" job to coordinate the logic when multiple programs are necessary.

The master job should handle I/O setting, checking for home position, and calling up child jobs. Avoid calling jobs from other jobs as the software will only allow 8 calls without returning to the parent job resulting in a stacking error.

Set a Proper TCP (Tool Center Point).

This is especially important when circular interpolation is required. Without a proper TCP, the resulting circular motion will be very erratic. TCPs also affect the cubic zone data. If the TCP is changed, the cubic data will also change. Also, use the automatic weight calibration function to set the tool weight. This helps to obtain the best acceleration rate for

the manipulator and also provides more accurate data for the collision detect functions. It is mandatory for functions such as Servo Float.

Motoman robots differ from other brands in that the TCP does not directly affect the programmed interpolation point. The control system reads the number of pulse counts on each motor rather than XYZ data of the tool. If you program the robot with a TCP and then change the TCP, the positional data will not be affected. The robot can be set up as "XYZ" data by using the optional Relative Job function. This is useful for offline program shifting and camera data displacement of programmed points.

If you are ever in doubt of how to approach the programming of your Motoman robot, do not hesitate to call our Application Technicians. Often times, they can point you in the right direction over the phone, saving you countless hours of reprogramming and down time.