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Packaging magazine

A new year in packaging automation has started, and what a different year it promises to be. Whereas industrial activities around the automobile industry remain in a state of shock after car sales collapsed, consumer industry-related companies continue to invest in the dearly needed automation of their sites.

The year 2008 ended beautifully with yet again solid growth in all different robot types. Our number of 4-axis picker robots is now well over 2,500 units. This allows us to share a broad wealth of experience, and offer you the most balanced picker robot ever, the IRB 360. Our further range of robots will continue to be upgraded and, for example, the new IRB 4600 has a number of exciting applications for our segment.

ABB Robotics remains in healthy shape as we have decided to focus some years ago on the consumer industry segment, and we can now state that it makes up an important share of our sales.

This leaves us less dented by the current market turmoil and from a more positive side, allowed us to build an extensive sales and services network globally with proven experience in our segment.

We will gladly share this with you, and we look forward to create sustainable added value together throughout 2009.

Peter Cuypers
Industry Segment Manager, Consumer Industries
ABB Robotics

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NEW ROBOT
for small but tough jobs

The latest news in palletizing for smaller jobs is a new robot from ABB, the IRB 4600. Fast, accurate, low-weight and medium-sized, the IRB 4600 features a new compact and lightweight design with an upper arm of aluminum and spur gears of ABB’s own design.

The robot incorporates QuickMove and TrueMove, ABB’s breakthrough sharp motion technology that defines precise performance and path accuracy with the shortest possible rapid cycle time – up to 25 percent less than the industry benchmark. Designed for a range of applications, the IRB 4600 is ideal for palletizing on a small scale.

The IRB 4600 comes in four versions: two short-arm versions (2.05 m) for 60 or 45 kg payload and two long-arm (2.50 & 2.55 m) versions for 40 or 20 kg. The new robot features an ultra-wide working range and state-of-the-art path performance. It can be mounted on the floor, shelf mounted, as well as tilted and even inverted.

With a weight of just above 400 kg, the IRB 4600 is the lightest general-purpose robot around. The new design without a parallel rod gives a wider working range and the compact body will fit into the user’s workshops, taking up less floor space than any other robot in its class.

Competence Center for Food & Beverage launched

At the end of January, ABB opened the doors of a facility designed to meet the needs of its partners and customers working with packaging. The new Competence Center for Food & Beverage is located in Warsaw, Poland and the aim is to provide support to ABB partners in Central and Eastern Europe. The center is not restricted to companies from the region however, but is open for any partners or customers interested in its services.

The center will work with technology, tests and training for picking, packing and palletizing applications of a wide range of products. The center facilities include a robot cell for picking and packing with a FlexPicker robot, an IRB 260 robot and PickMaster 3 software, as well as a cell for palletizing with an IRB 660 robot and PickMaster 5 software. Contact: Mats Halen at +48 22 51 52 814 or mats.halen@pl.abb.com.

www.abb.com/robotics
Finland is a country of 5.2 million people, which is not much considering it is Europe’s fifth largest country by area. But when it comes to one of the traditional pastries in the country called “Karelian pies,” there’s no denying Finns have a large appetite.

Karelian pies are made of a roundish wheat shell that holds rice porridge inside, baked in the oven for 12-15 minutes at a very high temperature. As the name suggests, the dish originates from Karelia, a geographic area that is divided between Finland and Russia.

Each year, Saarioinen’s bakery in Valkeakoski, Finland, some 90 miles from Helsinki, produces almost 40 million Karelian pies. With just a tiny fraction – 0.5 percent – of the production exported to neighboring Sweden and Estonia, it is safe to say that the Finns eat a lot of Karelian pies. About one Saarioinen nine-pack per person per year.

To get those 40 million pies – and Saarioinen is not the only producer in the country - out to their market, Saarioinen has two packing lines, with six ABB FlexPickers in total.

“Of the two lines we have, one is used only for packing of the large, traditional pies, and the other is used both for that and for packing of the smaller, hors d’oeuvre-sized pies,” says Mika Miettinen, production manager at the Saarioinen Valkeakoski bakery that also produces pizzas, Finnish meat pies, and Italian-style bread.

“Right now, we pack 10,000 big pies and 12,000 small ones per hour,” Miettinen adds.

But the three-year-old system has capacity for much more, adds Miettinen’s right-hand man, Pekka

Nice finish for Finnish pies

Stacking and packing tens of millions of traditional Finnish pies every year is no easy job if done manually. But for robots, it’s a piece of cake. Or should we say pie?
**The next generation**

The IRB 340 wash-down version of the FlexPicker that Saarioinen uses is especially suited for use in packaging applications with open food, such as meat, dairy products and ready-made meals.

It’s integrated with the IRCS controller, through PickMaster, a controller software that gives the IRB 340 a capacity of more than 150 picks per minute.

To pinpoint random objects, the PC-based software uses a high performance robust vision system. It identifies and transfers 360 degree random objects in 50 to 200 ms.

For those interested in the next generation, the IRB 360 FlexPicker is the latest ABB robot solution for precision pick and place applications, extended to three models, stainless steel, compact, and standard versions with handling capacities of one and three kilograms.

**Benefits of Automation**

Since Saarioinen has begun using three IRB 340 FlexPicker robots to pick and pack its Karelian pies, the company has found a number of benefits:

- Better working environment
- Improved reliability
- Better quality control
- Lower costs

Production manager Mika Miettinen, right and his right hand man Pekka Pettersson.

Pettersson. “We could, in theory, use the same packing line and go up to 24,000 pies per hour,” he says, and smiles.

**The ABB robots** get to work about an hour after the pies are baked, once the pies have been cooled off, the line brings them to the cell with the pickers. A camera snaps a shot of each pie for quality control, and to let the pickers know where each pie is on the conveyor belt. That information travels about 60 meters, to the computer, and then back to the pickers in nanoseconds.

The first two pickers take care of the bulk of the stacking and packing, with the third one acting as a backup, picking the ones the two first robots missed.

The pickers have soft moulds that they place around the pie and simply slide it to its place on a parallel conveyor belt: three pies side by side, three in each pile.

The piles travel another two meters, get wrapped in plastic, and then are packed into the boxes that get trucked to grocery stores around the country.

“The initiative to move away from people doing the packing to an automated solution came from us” says Miettinen. “Even with job rotation, people...”
had to stand there five hours a day and pile the pies, and we don’t want our employees to have the kind of problems with back and neck that they did.

“Secondly, with the camera, and robots, I am sure our quality is now better than in the past. There’s no human element there, the camera doesn’t get tired. And thirdly, it helps us get the costs down,” he adds.

“And, the robots will be there every Monday morning,” says Pettersson.

The switch was planned well in advance. Working with food production poses several challenges: There are hygiene and temperature considerations, and with the volumes that Saarioinen has, the margin of error was zero, and the line has been completely tailored for Saarioinen’s needs.

“It went surprisingly smoothly. We had to work with the camera a bit, and work with some of the picker materials, but nothing really major,” says Pettersson.

Leo Johansson, founder of Trimaster, the engineering company that designed the robot cell for Saarioinen agrees.

“The challenge with Saarioinen was the uneven shape and softness of the pies. We ran numerous tests with different kinds of pickers to figure it out.

“Once there was a solution for the picking, the number of robots needed was simple to calculate,” he says.

“The software that steers the operation has been upgraded several times, and the whole line develops and improves continually,” adds Pettersson.

At the end of the day, all belts and robot cells are washed by hand, but even that hasn’t been an issue. The actual pickers come apart and can easily be washed, and the robotic machinery stays hidden under cover.

Miettinen and Pettersson say that their experiences with the two lines are encouraging and will be helpful in further applications in the future.

“Many of our products are unique, they look different, so our knowledge of these pickers will surely keep us thinking of similar solutions for other bakery products,” says Miettinen.

At 2.50 euro for a nine-pack, nothing, not even an economic downturn can stop Finns from eating their traditional pies.

About Saarioinen
- Privately owned food industry group and one of Finland’s leading food manufacturers
- Saarioinen’s roots date back to the year 1469 when Saarioinen was first mentioned in historic documents. The current owners acquired Saarioinen mansion and the surrounding fields in 1941, which marks the beginning of the modern company.
- In 2007, the turnover result before extraordinary items was EUR 24.1 million
- Approximately 2,100 employees

About Trimaster
- Established in 1998, based in Tampere, Finland
- 10 employees
- Net sales of EUR 2.5 million
- Trimaster creates robotic solutions for loading of packaging lines and shipping of the product
- The first Pickmaster-controlled robots were installed four years ago, and today, there are over 40 over them in place

22,000 pies are packed per hour, which amounts to some 40 million Karelian pies sold annually by Saarioinen. That’s nearly nine pies per Finn per year.
Together, five robots and one operator turn out one Risperdal Consta blister pack every second.

The founder of the Belgium-based Janssen Pharmaceutica, Dr. Paul Janssen, was responsible for laying the foundations for the schizophrenia drug Risperdal Consta. Now Janssen Pharmaceutica is the scene of another innovation: a new packaging line where five IRB 340 robots from ABB ensure that the conveyor belts at the company produce one drug a second.

The new system is an ingenious one. System integrator Intrion combined machines from various manufacturers to make up a single well-oiled system.

The packaging line starts with the supply of syringes to the packaging machine on a conveyor belt. A vision system captures the contours of the syringe and communicates the syringe’s position to...
“A drug is always a long-term product, so it is worth the investment.”

Chris Vleeschouwers, Intrion

Intrion at a glance
- Founded in 1973
- Intrion is a result of the merger of Createch Engineering and Dolmen Industrial Projects
- Yearly revenues are 25 million euro
- 150 employees

Benefits of robots
- 60 blisters per minute
- Extremely accurate
- PickMaster software aids flexibility
- Save operator from doing repetitive work
- An ROI of less than two years
- Robot is very reliable with a meantime between failure of over 100,000 hours

the first robot so that it can quickly and easily pick up and place the syringe in the blister.

The blisters are also made there directly, created from a roll of environmentally friendly, heated pvc using compressed air and a vacuum seal. The blisters are then filled with three Risperdal Consta components: the syringe, the needle kit and the vial containing the drug’s active ingredient. Three robots quickly and accurately place their own component into the blister. The robots are continuously communicating with each other. For example, Robot 3 will know exactly where Robot 1 has already placed a syringe and where it should then position the vial.

A color camera then scans the filled blister to verify that all components are present. If an irregularity is detected, the blisters concerned are transported to the waste container. Approved blisters go to Robot 4, where the package leaflet is added. The fifth and
final ABB robot then applies a foil cover to the blisters intended for retail and places them on a conveyor belt to be packaged in cardboard boxes.

The robot installation can produce 60 finished blisters per minute. This production rate could never be achieved manually. Two people would be needed for each component – needle kit, syringe and vial – so a total of six people would be required simply to fill the blisters. At the moment, only one person is required to continuously supply the machines with vials and needle kits.

A complete exclusion of humans is impossible in this setup. “Because we are dealing with drugs, everything must be inspected by humans,” says Janssen Pharmaceutica project engineer Eric Kooremans. “This is too important. No matter how accurately a machine is set up, it is never infallible. We also test the robots every day. Every now and then, our operators put the wrong product into the blisters, to see whether the system’s inspection functionality is working properly. So far, we haven’t caught the robots doing anything wrong.”

In June 2008, Intrion started constructing the Janssen packaging line. It took three months to build, validate and put into production, but all parties agree that it was worth the effort and the investment. “A drug is always a long-term product, so it is worth the investment,” says Intrion operations director Chris Vleeschouwers. “We would never suggest such a system for a trendy, non-food product that will only last a short while. The PickMaster software application is a huge advantage of the ABB robots. It is an extremely flexible control tool. You can link external devices up to it, as we have done here with the color camera.

“It is also a very open system that can be programmed efficiently by our specialists. Until last year, no other robot manufacturer offered a similar ‘FlexPicker’ type of robot. It is an exceptionally fast and accurate robot for this purpose. We make it do one hundred picks and places a minute. It could theoretically handle almost twice that many, but then we would be compromising on accuracy, which we should never do where drugs are concerned.”

One of Janssen Pharmaceutica’s main reasons for choosing the robot system is the great flexibility it offers. The robots can also easily pick other products to be placed into blister packs. If traditional supply systems were used, the initial investment would be much higher each time. The robots will maintain their purpose and value if they are ever removed from the line. They can easily be expanded, reprogrammed and used for other lines and products.

One final and significant advantage of using packaging robots is that the robots do the simple, repetitive work. Nobody has to stand by a conveyor belt all day placing syringe after syringe into the blisters. The operators carry out inspections and provide a regular supply of products, which results in much more job satisfaction.
No more manual labor for fruit

When Australian cannery SPC Ardmona switched its palletizing system, it found other advantages other than just packing more pallets. The new system also opened up opportunities for new business.

Staying competitive in the fast-moving consumer goods business requires staying on top of the latest developments in safety and production technology. So when SPC Ardmona needed to replace its case palletizers, it saw a significant opportunity to get the utmost out of a new flexible automation system. The company is no stranger to flexible automation and already had a number of ABB robotic systems in their plants.

The challenge was to develop a high speed palletizing system capable of handling a wide variety of pack types, sizes and pallet patterns – from wrap-around cartons to open-top and shrink-wrapped trays of canned food. Not only did the system need to handle cartons with layer stabilizing glue on their tops, it also needed to handle low-profile open-top trays, shrink-wrapped trays and even loose cans.

“There were several drivers behind the project. We have high production standards for our plant and wanted to modernize the palletizing to remove manual intervention, maintain the highest level of safety and have equipment that is well supported for the future,” says Brett Mortison, Logistics Operations Supervisor, SPC Ardmona.

The heart of the system is an innovative layer-forming solution using the IRB 260 robot. Combining the accuracy of the IRC5 conveyor tracking with the speed and robustness of the IRB 260, SPC Ardmona has been able to use a simple and reliable...
About SPC Ardmona

SPC Ardmona is a premier name for fruit, with popular brands such as Goulburn Valley, Taylors and IXL. Products include not just packaged fruit and vegetables, but condiments, sauces and marinades as well.

Formed by the amalgamation in 2002 of SPC – originally founded in 1918 – and Ardmona – founded in 1921 – SPC Ardmona has been owned by Coca Cola Amatil since 2005. Their products are marketed both nationally under the SPC brand, Ardmona brand and Goulburn Valley brand as well as internationally under the SPC brand and several private label products sold principally to Japan, Canada and the U.K.

Better with automation

Since SPC Ardmona has installed IRB 660 and IRB 260 robots for their palletizing, it has seen a number of benefits:

- A significant increase in the number of pallets produced per shift.
- Easier to comply with safety and operational processes.
- An improvement for workers who no longer have to manually palletize, which can be physically demanding and create safety problems.
- The flexibility has opened up new opportunities that have already resulted in new business.

“The system was very innovative.”

Brett Mortison, SPC Ardmona

... gripper. The robot comes down over the top of the carton on the in feed conveyor, slides the carton into the required position on the layer forming conveyor then lifts just off to clear the placed carton and goes straight back to grab another carton from the in feed.

The formed layer of cartons is transferred into the waiting gripper of an IRB 660 layer-palletizing robot. The IRB 660 robot moves from the pickup position to the top of the palletizing stack where the layer is released. Layers are formed so quickly, two IRB 660 robots are required to keep up. “The system was very innovative and we saw new opportunities in that for our business,” says Mortison.

It is the IRB 260 robots that steal the show, however. Anyone passing the system is mesmerized by the robots’ speed and precision. But it’s not just fascinating to watch from the outside. The IRB 260 robots give flexibility in pattern and product handling that allows much easier development of new products to suit consumer needs. “The flexibility has enabled marketing to try some innovative things,” says Mortison. “And that’s already resulted in new business.”

The line was installed in early 2007, and is being well-utilized. “At peak production we run around the clock, seven days a week,” says Mortison. Aided by ultra-reliable operation and high uptime, the system has set new records for the number of pallets produced per shift.

An increase in the rate of pallets produced isn’t the only benefit that SPC Ardmona has obtained from the new palletizing solution. With the robots, constant manual intervention is no longer necessary, and by removing the need for manual work the company has found it easier to comply with safety and operational processes. It has been a boon for workers. “The operators have been keen learners and embraced the technology wholeheartedly,” says Mortison.

SPC Ardmona’s investment in flexibility, reliability and safety mean it’s not just the cans that are in safer hands.
Meeting the needs of meat handling

Packing meat is a delicate process, especially when the packaging needs to be perfect. When the Swedish meat wholesaler Atria needed to improve its production, it turned to automation.

In 1907, when Oskar Lithell started a modest charcuterie operation in basement premises in the little town of Kumla in central Sweden, it was the beginning of an enterprise that would grow to become the Atria Group, one of Sweden’s biggest food suppliers, with a turnover of 11.7 billion Swedish crowns (1.7 billion U.S. dollars) and 5,800 employees.

At Atria Chark & Deli, the company’s facility in Årsta on the outskirts of Stockholm, meat is packaged that is destined for the tables of customers of the Swedish food retail giant Coop. Each day, some 9,000 plastic crates of ground beef and other cuts of meat are packaged – on peak days, there can be up to 11,000 crates packed. The facility handles some 10,200 metric tons of meat each year. The meat itself is provided by suppliers and comes from Sweden, as well as Finland and Denmark.

Until 2007, the meat was handled by flowpack machines and manually. But Atria’s primary customer, Coop, raised their demands, requesting that the operation be automated. “The demand came from Coop,” says Denniz Erol, local manager at Atria Chark & Deli. “Coop required top sealing for all of its products. Which is how the products look, as well as how they are displayed in the store. Coop wanted labels that are easy to see and to read by consumers.”

For Atria, it was also a matter of improving capacity in a limited amount of space.

The company turned to FlexLink, an international automation specialist that came up with a solution that uses robots throughout, coordinating with Wecoma, another specialist in material handling, and software company Nemco.

The process begins with manual controlled inspection of the meat by some 25 employees who ensure that the products are undamaged in any way and are the proper color, among other things. Once
Atria at a glance

- Founded: 1907
- Employees: 5,800
- Turnover: USD 1.7 billion
- Facilities: Sweden, Finland, Denmark, Russia and the Baltic countries
- Products: meat, fish, poultry pre-prepared salads, sandwiches and other foods, cheese, frozen ready-to-eat
the meat passes inspection, it is sent to appropriate packing stations, depending on the cut and type. Cutlets, cubed beef and other cuts of meat of variable weights are sent to three stations where they are manually packed. But ground beef, which makes up 60 percent of Atria Chark & Deli’s products, goes to the new automated system.

These two other stations each has its own IRB 260 packaging robot. Here, each station is fed trays of meat with a fixed weight, which are then packed into SRS return crates.

The crates are sent up a small elevator to rails that run over the entire packaging station. The crates are sent along the rails to the palletizing station, where two IRB 660 robots handle six crates at a time that are loaded onto a pallet below the robot. When the pallet is full, it’s sent by truck to the delivery station in preparation for transport.

The project began in September 2007, and was installed by November 2007.

“It felt like building a JAS fighter plane in a week,” says Erol, who was impressed with the high-tech solution and the ease with which the installation went. “The installation made by FlexLink went quickly and painlessly. Everything worked well, thanks to good planning and cooperation between FlexLink and Atria. We were only closed a total of six days, of which three were for the installation itself.”

And the company is happy with the ABB robots, which were chosen by FlexLink. “We’ve had previous good experience using ABB,” says Hans Grönqvist, FlexLink sales representative who worked with Atria on the project.

Since the beginning, Atria has seen positive results. Production capacity has gone from 40 kilograms of meat per hour per person to 60-65 kilograms of meat per hour per person. The normal capacity is 9,000 crates per day. More can be produced for seasonal needs, such as grilling season, or holidays. And working conditions are better for employees, Erol says, who no longer need to do the same lifting and hauling, for example.

So far, there is only one shift, but the company sees the possible need to go up to two shifts. Which won’t be a problem for the robots! ☺️
Green food requires green production

Consumer demand for green products has long gone beyond granola and tofu. What consumers want are products that are produced environmentally from start to finish.

- Eco-friendly. Sustainable. Call it what you will. But one thing is certain: we’ve come a long way from tofu burgers in “green” production in the food and beverage industry. And perhaps the biggest lesson of all is it’s not what you make, but how you make it.

Consumers today are demanding “environmentally friendly” food products, which involves calculation of the complete life cycle cost (including environmental factors) of the product. But it’s not enough that manufacturers strive toward green practices. Consumers want to know through labeling and product certification specific information about their purchasing decisions, especially in terms of CO₂ output.

In response to concern about global warming, and subsequent consumer and legislative demands, many companies are striving to measure their “carbon footprint” - the environmental impact of their manufacturing processes and products in terms of CO₂ and other greenhouse gas emissions. A number of organizations around the world, such as the U.K.-based Carbon Trust, are developing carbon labels to display on product packaging. The labels show the carbon production embodied in the product. Walkers’ potato chips and Innocent drinks are two examples of U.K. products that bear carbon labeling.

But as helpful as carbon labeling may be, it is not a complete measure of the total effect of a manufacturing process on the environment. “Green” manufacturing is about the full impact of an entire process and not just a specific outcome.

Some retailers are taking a “big picture” approach towards environmental issues. “At Sainsbury, we look at CO₂ in terms of energy and in a broader context,” said Stuart Lendrum, print and packaging manager for U.K.-based Sainsbury food stores in issue No. 29 2008 of Inspire magazine. “Besides energy, we look at transport, sustainable construction, water, and waste. If you look at just one piece of the puzzle, it can lead to an emphasis in the wrong place.

“Climate change is certainly a key driver of our environmental policy, but our primary concern is sustainability. For example, we strongly support the Fair Trade Federation, which takes a holistic approach toward product sourcing, and we actively offer our customers Fair Trade products. The interplay among environmental, social, and economic issues is very complex, which is why we work hard at always trying to see the full picture.”

One of the strongest trends in food production is pouch, or flexible, packaging. In the United States alone, demand for pouch packaging, including the non-food sector, is expected to grow 6.1 percent annually and demand for stand-up pouches is expected to increase almost ten percent annually through 2012, according to The Freedonia Group, a business research company.
Launched in 2008, the ABB FlexPicker IRB 360 robot is the next generation of the IRB 340. It retains delta configuration for superior performance, meaning less waste and higher production.  
- Handles payloads up to 3 kilograms – targeted toward packaging
- 110 picks per minute with 3 kilogram payload – which means over 20 percent improvement in average cycle time
- Flexible formats and grippers. No downtime when changing from one packaging format to another
- Completely watertight design for quick, easy cleaning
- Second generation QuickMove and TrueMove motion control systems with automatic error detection system
- Modified arm design: requires less floor space than IRB 340
- Improved component design for even less maintenance
- Uses less energy than IRB 340 - in ABB test cycle the mean power consumption for the IRB 360 (477 W) is 15 percent lower than for the IRB 340 (562 W).

FACTS

The IRB 360 is the latest generation of the FlexPicker, with a 20 percent improvement in cycle times.
There are lots of reasons for the popularity of pouch packaging. A foil or multi-layer film pouch is conducive to bright, eye-popping graphics while a clear barrier material allows consumers to see the actual product inside. Both qualities are important factors in brand differentiation. Pouches are also economical for short product runs, which allow manufacturers to launch more product variants faster. And pouches are an excellent packaging format for the fast-growing convenience and prepared foods, and single-serving portion market segments.

But is pouch packaging “green” enough? In some ways, this is a moot issue. Visit any major food store and it’s clear that pouches are here to stay. With newer applications such as microwavability and product extensions (mix and serve directly from the pouch), expect pouches to be even more ubiquitous in the future.

But pouches can be environmentally attractive. They can be inexpensive to produce, and they are lightweight and stackable, which makes them easy to transport and store. This means reduced transportation and storage costs. So it’s not surprising that some companies have reported significant environmental gains in terms of CO₂ emission and solid waste disposal in pouches over traditional packaging. Although pouches are a good green choice for production, transportation and storage, they are not so far easily recyclable, but this looks to change as well with at least one manufacturer who has now launched mono-material pouches.

Another development in “green” production is automated solutions and robots. “Green” production is ultimately an argument for efficiency – itself a function of product and process design. ABB offers several robots specially designed for picking, packing, and palletizing – basic operations in the food and beverage industry. Of special interest is the FlexPicker robot (model IRB 360 replaces model IRB 340).

The FlexPicker can help food manufacturers dramatically reduce product waste, a major resource and energy cost for food manufacturers, and increase productivity. After installing the FlexPicker IRB 340 on one product line, crisp bread manufacturer Wasa-bröd experienced a 50 percent reduction in product waste and a ten percent increase in productivity. Pretzel manufacturer Roland Murten AG experienced a significant reduction in scrap, with breakage of its delicate product going from 15 percent down to 2.3 percent, which also allowed the company to cut power consumption on its main production line by some 12 percent (a savings of USD 17,000 per year).

Says Walter Fuchs, head of production at Roland Murten: “You have to take more than just procurement costs into account. The savings in operational costs also need to be factored in, and in our case we achieved significant reductions in costs for staff, energy and wastage.”

“The FlexPicker IRB 360 is a key driver of our environmental policy, but our primary concern is sustainability.”

Stuart Lendrum, Sainsbury

The FlexPicker needs relatively little floor space and energy for operation so additional production-related and energy savings were also achieved. Although manufacture, operation, and disposal of the FlexPicker itself entail certain environmental costs, which are carefully analyzed by ABB’s own sustainability criteria, production benefits to customers far outweigh these costs.

Robots are a tool for improving total efficiency, the heart of the matter when it comes to eco-friendly production and sustainability. Says Ben Miyares, vice president of Industry Relations for the Packaging Machinery Manufacturers Institute (PMMI) and keynote speaker at the 2007 ABB Global Packaging Forum, “We need to stop thinking about pricing in terms of what a robot costs, and instead look at the total cost of operations.”

This includes benefits for “green” production.
Fast and flexible with new software

Palletizing is made easy with the right software: PickMaster 5.

When it comes to palletizing, line engineers and operators have a new friend in ABB’s PickMaster 5 packaging software. The software not only reduces the need for robot programming to a minimum in the engineering phase. It also provides maximum flexibility and safe uptime in production. The result is a savings in hundreds of hours in programming and testing leading to a safe and maintainable solution for years to come.

PickMaster 5, the second generation palletizing software from ABB, is based on more than 10 years of palletizing experience carried over into a modern and highly flexible new palletizing software.

All the features needed to create a robust palletizing application are included in the software and no robot programming is required even if the software is open and accessible for the highest flexibility. A key element is that the software is designed to be forgiving when it comes to late changes in the application, without causing re-programming.

PickMaster 5 applications are configured off-line on a standard laptop with application specific data. The resulting configuration is transferred to the IRC5 robot control over the Ethernet. Once configured and transferred, PickMaster 5 runs independently of the PC on the IRC5 controller, either using the FlexPendant as a comprehensive operator’s panel or remotely controlled from a line control unit. While an operator easily starts, stops and supervises the palletizing process, he or she can also make up for unforeseen exceptions in the normal productions process by intuitive interaction with the PickMaster program – no matter if there was a dropped product or a malfunctioning feeder. This makes the PickMaster 5 software tightly integrated in the palletizing environment, yet very flexible and adaptive through its generic communication interface.

The PickMaster 5 software is designed to allow the highest degree of flexibility over the whole product life cycle. In the palletizing system design phase, the user can then fully focus on how to achieve the highest productivity and new products can safely be added later and immediately put into production. This can be done with no worries about the final outcome as the new pallet loads can be examined regarding reachability and intermediate stack heights are supervised to avoid collisions.

The software breaks down the configuration information and generates all necessary information the controller needs to run the application. Since no programming is required, late changes can be done without causing any re-programming.

Incoming products no longer must be assigned to one specific infeed/outfeed over the time. PickMaster 5 easily and directly adapts to changes in how the products are fed and also where they should be palletized, without any re-programming.

PickMaster 5 can handle multiple infeeders and multiple outfeeders in simultaneous production. Mixing different products from many stations to one pallet is as easy as distributing loads to several palletizing stations. A powerful pallet-pattern generator is included involving multi-drop movements with multi-zone vacuum tools or mechanical grippers.

**Features of PickMaster 5**
- Easy to use graphical Line and Project configurator
- Automatic pattern layer calculation
- Library and import function for patterns
- Automatic generation of optimized robot movements
- Stack height search
- Collision avoidance
- Reachability check
- Speed and acceleration control
- Built-in gripper configuration
- Generic station signal interface
- Integrated station sequence logics
- Error recovery
- Dual operator interface
  – from FlexPendant or remote
- On-line tuning
- MultiMove

**>FACTS**
In the United Kingdom, at the Tetley GB Ltd tea packing plant, robot downtime is slashed using a new innovative online service.

Tea time

Tea is known the world over for its tea. And its tea packing plant in Eaglescliffe is the sole producer in the United Kingdom of the famous Tetley tea bags. But when Tetley GB Limited, part of the Tata Group, was having a spate of problems that affected its production in Eaglescliffe, the company turned to ABB for a robot monitoring technology solution that identifies potential crises before they escalate, or sometimes even occur.

Previously, the plant’s maintenance manager, Colin Trevor, had been experiencing problems with the production line, with some robots occasionally tripping out on alarms and causing delays to the whole production cycle. The company uses two IRB 6600 robots from ABB in the packaging of its tea.

“We had been experiencing a number of breakdowns during production with spurious alarms,
causing the robots to periodically stop,” says Trevor. “This obviously caused some concerns with our engineers, who were not sure what the fault was and, because of this, we spent a lot of time re-setting the robots, hoping the next breakdown wouldn’t occur.”

Eventually, Tetley called an ABB engineer to the site, who helped to trace the problem to a fault with the alarm settings on the robots. “Although the problem was easily remedied within just 30 minutes, the downtime we’d incurred through trying to trace and rectify the fault meant that several hours of production time were lost,” says Trevor. “It was for this reason that we were keen to try out ABB’s remote service agreement.”

The agreement provides access to ABB’s remote monitoring technology, which uses a service box and system infrastructure installed into the robot’s control system. Using these tools, ABB can monitor and collect data on the wear and tear and productivity of robotic cells, which can then be shared with the customer if required. This helps to ensure stops in production are prevented rather than ABB simply assisting in recoveries.

To prevent future disruption to production caused by unplanned downtime, Tetley has now fitted ABB’s remote service technology to robots throughout the plant.

David Pownall, Lifecycle Services Manager for ABB’s UK robotics business, underlines the value that a remote service agreement can bring: “In today’s competitive environment, business profitability often relies on demanding production schedules that do not always leave time for exhaustive or repeated equipment health checks. Our remote service agreements are designed to monitor our customers’ robots to identify when problems are likely to occur and ensure that help is dispatched before the problem can escalate. In over 50 percent of the cases we deal with, our robots can be brought back online remotely, without any further intervention.”

Commenting on the impact of the agreement, Trevor says that the remote service package has already dramatically changed the plant. “We no longer have break-down issues throughout the shift, helping us to achieve much longer periods of robot uptime,” he says. “As we have learned, world-class manufacturing facilities need world-class support packages. Remote monitoring of our robots helps us to maintain machine uptime, prevent costly downtime and ensures my employees can be put to more valuable use.”

With manufacturers needing to invest in robots to reduce labor costs while increasing productivity and quality, a service package is key to the purchasing decision process, says ABB’s Pownall. “We are determined that our commitment to service should be the reason why customers choose ABB and continue to partner with us in their future investments,” he says. “Our service expertise, plus our wealth of experience in effective preventive, planned and scheduled service and support, means that maintenance should no longer be viewed as a high-expense activity. Instead preventive maintenance can help our customers ensure their production line runs according to plan and on time, every time.”

**Facts**

Better service

At Tetley’s tea packing plant in Eaglescliffe in the United Kingdom, the company gained a number of benefits from ABB’s Remote Service for the IRB 6600 robots the company uses for packing tea:

- Less downtime
- Better-maintained robots
- Better use of employees
- Less service needed as problems can be solved before a service technician is needed
Keeping Swiss time

Forget the Alps. Forget cheese fondue. No one can say they have truly visited Switzerland without having bought something from a Migros supermarket.

Migros was founded in 1925 in Zurich by Gottlieb Duttweiler who had the original idea of selling only six basic food products at low prices to clients which, in those days, did not have ready access to markets of any kind. When Migros started out, it sold only coffee, rice, sugar, noodles, coconut oil and soap from trucks that went from one village to another.

Today, Switzerland’s retail giant Migros employs 80,000 people and offers services that spread from supermarkets, its core business, to banking and holidays. More than 530 Migros supermarkets are spread across the Alpine country — making it in effect impossible to ignore. Migros says that a quarter of the food in Switzerland is purchased at businesses belonging to the Migros Group. This is due to the fact that 99 percent of Swiss families shop at Migros, at least once a year, says the company.

Some 90 percent of products sold at Migros supermarkets are in-house products and 50 percent of those are from its own factories — including Bischoffszel near St.Gallen.
Bischofszell’s specialization is canned fruits, jams, tea drinks, fruit juices, pre-prepared soups, potato products such as crisps and French fries, and frozen food products from vegetables to prepared meals.

“In one year we produce 2000 products for a worth of about 500 million Swiss francs,” says Herbert Zoller, Head of Project Investment at Bischofszell.

The sheer expanse of the Bischofszell Bina food factory underlies the number of shelves it has to fill across the country. Nestled in the valley below the town of Bischofszell, it looks more like another town rather than a factory.

Some 850 people work full-time producing food products for its parent company Migros, 600 of which in production.

Zoller says that robots have an important but limited role in the production of food products, due to the delicate handling needed for food. Still, Bischofszell has not shied away from the use of robots but has merely locked them into a specific link in the production chain. They have practically taken over all the packaging and palletizing roles.

The Bischofszell factory is ABB Switzerland’s second largest robotics client with 17 machines, spreading across eight different models.

“Our interest in robots is dependent on the solution and function the robot provides and its greater flexibility,” Zoller says.

He adds that Bischofszell had been using robots for the past ten years, but that rather than replacing employees it has merely freed them to do other – less menial – jobs.

“It is crucial for us, however, that within two to three years we see a return on the capital investment in the robot,” says Zoller.

An example of a successful introduction of a robot was when an IRB 660 was introduced in 2007/2008 to remove empty glass containers from a pallet.

One pallet, with 4,000 glass jars on it, is first stripped of a plastic covering by an employee before being channeled toward the robot. The robot then, with a suction gripper system, removes the top protective layer and places it on a stack of other protective layers before returning to the first layer of glasses (over two hundred glasses per layer) and taking them up to carry them to a mechanism that channels the jars onto a conveyer belt. The robot then returns to remove the next protective layer, stacks it, and grips the next layer of glass jars. Some 17 layers and nearly 4,000 glass jars later, the robot then removes the pallet and places it on another pile before starting on a new stack of glass jars.

“The job was done by one woman, under non-ideal conditions – it was a hot part of the factory. But while the machine is not necessarily faster, it has freed up the woman to do other things,” Zoller says.

Another robot, the IRB 340, was introduced some six years ago to package salad boxes. Zoller again says the key advantage is that it has freed two employees for other jobs.

“The robot is also more flexible in terms of shifts – if we need a double shift it will just do it – no complaining.” However he adds that even if the robots could work faster that is not possible because the food products have to be handled by humans due to their delicacy and so the speed on the production line was inevitably set by human labor.

Zoller says that at key point in Bischofszell’s investment decision in robotics is the possibility to outsource their management – from solution creation to after-sales service.

Then Moveline entered the picture.

Moveline is an independent company which provides technical assistance and after-sales service. Working as a link between ABB and Bischofszell, it was
Migros at a glance
• Founded in 1925 in Zurich by Gottlieb Duttweiler who had the original idea of selling only six basic products, such as oil, sugar and coffee, by truck to villages with no access to markets
• In 1997 Migros had over 82,000 employees and sales of CHF 22,697 million
• 530 Migros supermarkets are now spread across Switzerland
• 25 percent of food in Switzerland is purchased at businesses belonging to the Migros Group
• 99 percent of Swiss families shop at Migros, at least once a year
• Some 90 percent of products sold at Migros supermarkets are in-house products and 50 percent of those are from Migros owned factories

Moveline at a glance
• Founded in 2002 by five former ABB employees
• Today has seven employees and a 4 million CHF annual turnover
• Plans, creates and integrates full robotic systems
• Focuses on consumer and manufacturing industries
• Provides ready to use robots and/or improves existing robotic systems
• Provides post-sale handling and maintenance service

Benefits for Migros
At Bischofszell there are one IRB 340, two IRB 4400, three IRB 640, two IRB 140, three IRB 6400, two IRB 2400, two IRB 660 and two IRB 6650 robots, with an additional IRB 6650 due for 2009. The benefits include:
• Employees freed to do less menial jobs
• Improves employee working conditions
• Greater production flexibility
• Return on investment in two to three years
• Higher reliability
• Lower maintenance costs

able to provide the technical knowledge combined with an understanding of the food sector that satisfied both ABB and Bischofszell.

Moveline, created in 2002 with seven employees, has worked hand-in-hand with Bischofszell and ABB to find the best automotive solutions for the factory.

"Especially, in this time of economic crisis, it is crucial to cooperate, discuss, argue and then find a solution. This is at the basis of a successful project, from both sides," says Zoller.

Bischofszell’s relationship with ABB and robots is continuing and in 2009 a new IRB 6640 robot, the factory’s third, will be installed. It will be inserted into a soft-package drinks palletizing chain which currently under a mechanized system, can pack 12,000 drink containers an hour. The new robot, which will replace two machines, will increase the speed by 50 percent and 18,000 drinks will be palletized every hour.

While food production may well still need the human touch, robots have certainly shown what they can do to speed things up, Swiss time. ☺
This is not a robot.

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Introducing robot-based automation is the fastest way to build new packaging machines. By complimenting your new or existing packaging line with ABB robots, you can cost-effectively improve performance, up-time and reliability. All with increased flexibility to quickly adapt to changing needs.

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