

## robotics, automation &amp; vision

# Marriage of technologies creates a perfect match

Companies that supply automation, robotics and vision systems have been expounding for a long time the benefits to be derived from adopting all or some of these technologies. Today there is real evidence that the marriage of the three may well create the perfect match.

The arguments for each are well rehearsed and seem, on the surface, to be compelling. Automation can improve productivity, repeatability, speeds and reliability; robots can solve difficult handling problems as well as doing repetitive and potentially harmful tasks on the line; vision/inspection systems can eliminate damaged, mis-packed or faulty products and so reduce waste and product recalls.

But many UK companies, particularly those in the small to medium category, have shown a marked reluctance to invest, citing primarily cost, lack of skilled labour to run and maintain the systems, and the need to be ultra flexible as customers demand faster and faster delivery times and shorter runs.

Have the suppliers been able to respond to these barriers and are they succeeding? The answer is an emphatic Yes!

## Bells & whistles

Machine builders have developed customised modular equipment to meet the required levels of automation; so the buyer does not have to have ALL the bells and whistles on offer, just those needed. Additionally the advances in control and component technologies means even 'entry level' models can perform as semi- or fully-automatic machines.

For robots the chief advance is in the cost, as well as the flexibility of equipment. Stirling Paatz, managing director, Barr & Paatz, explains, "The maths in favour of robots makes sense. During a period when hourly wages have doubled, the real price of robots has halved. Mass production has pushed down prices, while flexibility and functionality have hit new peaks. Most machines will pay



*"Industrial robots are recognised as the key components in the drive towards automation and represent one of the quickest ways of boosting productivity and reducing labour costs" - Stirling Paatz*

for themselves within two years and give an average service life of 15 years."

But he warns, "Robot investment is booming in China, with a 20 per cent increase reported in the latest figures. It is expected to install more than 100,000 industrial robots by 2015. And demand for robots is also increasing in the so-called low wage economies."

While there are some encouraging signs of increased investment in the UK food sector, and if we accept robot density as an accurate indicator of automation, then with less than 100 robots per 100,000 people employed in the UK; this is below almost every other advanced or emerging nation.

A case can also be made in favour of vision systems. Not only have costs come down dramatically but functionality has increased with the development of camera technologies and X-ray equipment which can see more faults and detect a greater range of contaminants than was previously thought possible, and at very high speeds.

Mick Keane, technical director at RNA

explains, "Recent requirements and trends towards flexible manufacturing combined with quality control have pushed the use of vision system technology into process lines and component handling systems. These systems are widely used to examine component parts in detail and evaluate the image to make accept/fail decisions. Also it performs data collection to assist quality control by identifying trends."

But the real breakthrough is the marriage of all three technologies into integrated production lines. Keane gives one example, "Vision guided robotic handling systems can automate the production line where small batch runs and sensitive, difficult components have been impossible or too costly to automate. The robotic arm, used for handling and manipulating the product and camera system both share the same PC-based control system in most cases integrated with a standard robot and controller."

## Uncluttered design

More open and less cluttered designs of processing and packaging machines can now accommodate robots easily, while cameras used in vision systems are small enough to be mounted almost anywhere. Key to all this is the ability to integrate the control of all these complementary systems together so that the operator can feel 'in control'.

*On the following pages a number of experts explain how these advances make such technologies the province of all sizes and disciplines of companies.*

### FURTHER INFORMATION

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robotics, automation & vision

UK ROBOT SALES

Robot sales data for the UK market in 2009 highlight the problems the financial crisis has caused in manufacturing. And although fourth quarter figures showed a 47 per cent rise on the same period in 2008, total sales (481 units) for 2009, represented a drop of 18 per cent on 2008 and was the lowest result recorded since figures began in 1997.

The largest industry sector was food with 20 per cent of the total, an impressive rise of 15 per cent on 2008. The automotive industry remains an important customer with OEMs taking 11 per cent, down from 18 per cent in 2008. Automotive components at 14 per cent were down from 18 per cent in 2008. Aerospace and pharmaceutical, historically smaller sectors, also achieved impressive growth on 2008 of 155 per cent and 71 per cent respectively.

Sales for handling applications continue to dominate showing a growth of 23 per cent on 2008. Arc welding, at 14 per cent took second place with significant sales being made in the final quarter of 2009, although the annual total was down by 29 per cent on 2008. Palletising, at 12 per cent, was the third largest application achieving growth of 13 per cent on 2008.

**'The Voice of Automation'**

**BARA**, part of the PPMA, provides a voice for the robotics and automation industries, when dealing with government, industry, financial and academic institutions. The aim of BARA is to promote use and assist in the development of automation in British industry. [www.bara.org.uk](http://www.bara.org.uk)

# Food groups get in the driving seat

Giving his view on robotics in the UK food and drink industry is Mike Wilson, president of British Automation and Robotics Association (BARA) and director of CenFRA, who draws on his experience with British Leyland Cars

Food companies are the largest growth area for robotics and automation in the UK manufacturing sector showing a 15 per cent increase in the uptake of these technologies in 2009, according to BARA's latest robot sales figures (see left).

Now a major market for automation and robotics, the UK food and drink sector is in many ways in a similar position to the automotive industry back in the 1970s.

Today auto-companies use robots extensively, but it was only 30 years ago that the industry had to face the challenges now being tackled by food manufacturers.

Initial challenges for auto-sector came from the robots themselves, plus a lack of application knowledge. To tackle these problems teams of dedicated engineers were employed to work with robot suppliers. However, most food and drink manufacturers, particularly smaller businesses, have very limited engineering resources and one of the most significant challenges for the industry is the identification of solutions for these concerns. Companies do not have the luxury of engineering teams to develop and test new applications in the way the automotive industry did 30 years ago.

The knowledge and experience gained by robot manufacturers over the last 30 years, has led to the development of easier to use robots that provide extensive functionality and very high levels of reliability. This improved product and superior performance is also provided at a much lower

price; robots now cost less than half that of 20 years ago.

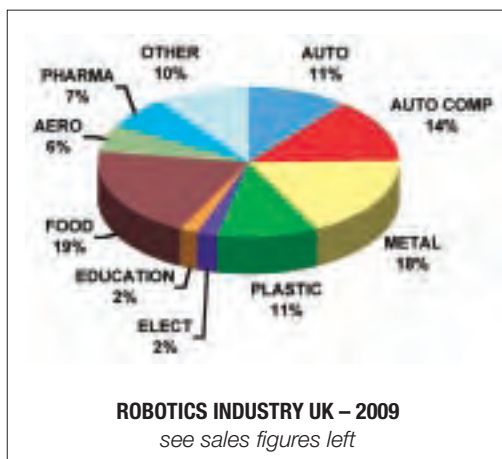
Robot and automation suppliers have recognised that different applications require different capabilities. General purpose robots are no longer built; machines are designed for particular applications such as picking and palletising, and recent models, such as the ABB FlexPicker and the Fanuc M-430iA, were designed to meet hygiene and wash-down standards for food applications.

There has also been significant progress in associated equipment and supporting technologies. For example integrating vision systems within a robot to provide an easy and affordable solution where conveyors present randomly positioned food products.

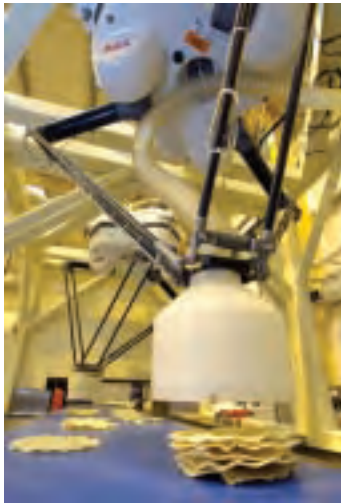
Another issue, solved by gripper technology, is the type of products being handled which are often delicate and/or of variable size and shape. RTS Flexible Systems has recently installed a robot system to pack poppadoms immediately after frying, and we all know how delicate they are! And Festo has developed a gripper concept, the FinGripper, which adapts its form to the object being picked; even delicate fruit, such as peaches, can be gripped without bruising.

Most challenges for robotics in the food and beverage industry can now be solved and there are many applications for which solutions not only exist, but are proven in production. These range from palletising through to secondary packing, primary packing and even food preparation, such as lettuce processing.

Food manufacturers in the UK lag far behind



## robotics, automation & vision



their European counterparts but there is increasing recognition that competitiveness can be enhanced through automation.

Engineers in food manufacturing do not have the time to develop new ideas, knowledge or skills, and have limited experience of robotics, which is proving to be a significant barrier to their introduction to the food industry. There are many proven and highly-effective solutions that can be applied easily to businesses but uptake is hindered by companies' lack of

resources or awareness of relevant suppliers.

Companies that do make the first step and contact automation suppliers are often reliant on their own knowledge and expertise, but selection of the correct supplier is often 'hit and miss', with better qualified suppliers left on the side lines.

Few customers prepare a detailed specification for suppliers and without clear direction from the customer problems often occur later in the project, while investigating and identifying issues which may affect the solution are impacted. Basic descriptions are reliant on the supplier interpreting the requirements correctly and the impact on performance can be significant.

While automation provides reliable performance, it does not have the same adaptability as humans and there must be some control of all factors that affect execution – whether tolerances on sizes, positions, or other characteristics like environmental factors. Recognition that competitiveness needs to be improved is driving the increasing interest in automation in the food sector just as it did for the automotive industry; and the lower cost of robotics is helping this process.

Automation performs reliably over many hours and does not suffer from lapses in concentration or tiredness, while vision systems remove the risk of operators missing rejects. Systems will still be performing reliably after 10 years significantly enhancing business beyond the initial payback period. In almost all cases a leasing arrangement, even on single shift operation, will provide a financial return from day one.

Essentially, companies that do invest will be those who gain business in the future.

### Find out more ...

**CenFRA** was created to provide support and assist food and drink manufacturing companies improve their competitiveness by introducing automation. The Doncaster-based centre is supported financially by Yorkshire Forward and is independent of any robotics supplier. It provides a factory audit to identify those areas where automation could be beneficial and this is supported by factory simulation software to model the operations and test alternatives to ensure the optimum solution. The centre has now conducted over 150 audits of food and beverage manufacturing sites, the majority of which would benefit from the application of automation. [www.cenfra.co.uk](http://www.cenfra.co.uk)

# Getting fresh with food

Fresh food markets such as dairy, fish and fresh produce are benefiting from the integration of robotic and flow-wrapping technology first developed for wet wipes.

Developed by PFM Packaging Machinery, working with robot manufacturer ABB and using its FlexPicker which operates at speeds up to 50 picks/minute, the integrated system is finding particular favour for fruit or vegetables that require orientation and automatic inspection before loading into shaped trays.

Most recently PFM and ABB have co-operated to produce a loading system for pulp trays of fruit such as pears that require orientation. The vision system employed on the robots provides reliable quality control for undersized, damaged or blemished product, states PFM.

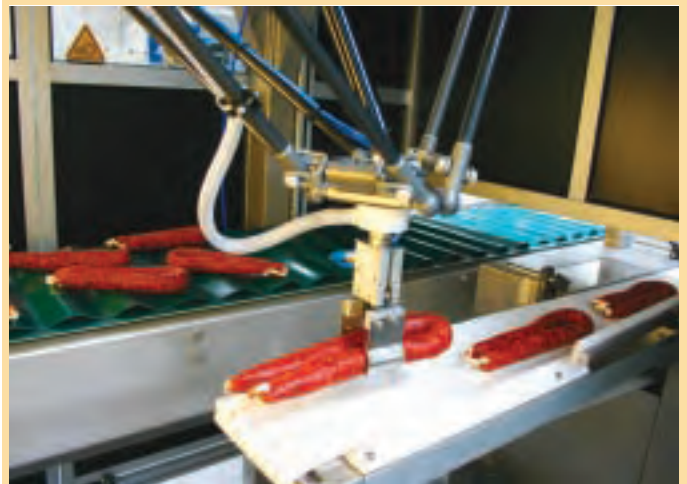
"Up to now much of this work has been carried out manually but falling costs of robotics and payback times of 18 months or less are persuading packers across Europe, even in areas of low labour cost, that automation with the ABB robot is an economic proposition," explained PFM's sales and operations director Chris Bolton.

The integration work was carried out by PFM's dedicated robotics department using purpose-developed software to link the machines. "Understanding of the application and the flow-wrapping process is the key element in successful integration of robotics and so PFM decided early on to employ its own specialists, versed in both technologies," said Chris Bolton.

In the cheese industry PFM's latest application is to employ robots on flow-wrappers to provide packers with automatic means of bringing wedges, which emerge from the weigh-cutting machine facing alternately left and right, into a single orientation.

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*PFM applications in the meat industry include a 24 hour operation handling sausages and salami arriving on a conveyor at random. Product is transferred to the flow-wrapper infeed in the correct orientation and pitch*

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# 'Tiny' robot knows its place

AA Robotics range of 'Tiny' palm-sized SCARA robots have a mounting surface so small that they fit into the palm of a hand. The Yamaha robots are designed for compact production processes for high-

precision tasks in manufacturing assembly and packaging for electronics, pharma, medical and plastics industries. They are designed for mounting inside a machine for pick and place applications. The smallest of

the two 4 axis robots has a 500g payload, a reach of 120mm - 150mm and a pick and place cycle of 1 second. Its sibling has a 180mm - 220mm reach (1kg payload).  
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the 'Tiny' range is Ansi compliant and CE marked. Each robot has two air pipes in the arm for gripper control and six electrical signals for feedback.

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## Oil keeps flowing

Comma Oils production of 20 and 25 litre plastic oil canisters is benefitting from a new palletising system made by Italy's LITA and supplied by UK agent Engelmann & Buckham.

Replacing manual operations, the 'Robodue' Cartesian axis robot takes canisters from filling equipment via a single infeed conveyor, and stacks them on the pallet row by row. Layers are built up so that each layer inter-locks with the next for overall stability.

The machine can be changed easily from UK (1,000mm x 1,200mm) pallets to Europallets (800mm x 1,200mm).

An automatic empty pallet destacker and automatic stretch wrapper, programmed to optimise the security of the finished pallet complete the installation.

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## robotics, automation &amp; vision

**SMEs CAN afford to automate!**

*Machinery Update* asks Nigel Steel, European sales manager, Electromechanical & Drives Division, Parker Hannifin his views on the future for automation.

***Smaller producers still see automation as beyond their means. Is this purely down to cost, or are there other reasons?***

Historically, automation systems have been seen as the preserve of larger manufacturers due to their complexity, the associated need for ongoing staff and other support requirements. Add the historic cost of purchasing and operating such systems, and it is easy to see why many companies felt that automation was not for them. Today the reality is somewhat different.

***Can automation be a viable solution in small to medium operations now?***

New technologies, changes in manufacturing processes and a greater emphasis on usability have led to simpler, more modular and scalable products which have opened up automation to a wider range of applications and smaller businesses.

By simply adopting a process of doing 'what is necessary' rather than 'what is technically possible', OEMs and end users can develop systems that are not overly complex or unwieldy and lead to tangible production or cost benefits.

***Can you describe some of the key developments and why they are useful for the processing and packaging sector?***

Electronic and mechanical components have benefited greatly from new technologies and materials in the last 20 years; this has led to smaller and more compact automation systems. Technological advances have provided more functionality in products as standard; examples include electronic cam profiling and application macros, making it simpler to automate existing processes and applications.

The wider availability of technologies such as ATEX approved motors and IP65 washdown actuators have opened up automation into areas previously considered too problematic or challenging. Advanced manufacturing techniques and new material developments offer higher levels of accuracy and repeatability at reduced cost, opening the possibility of automating more packing and process applications.



***Advances in modular automation systems are available now to integrate into existing lines. Can they be integrated effectively and what are the benefits?***

For many years, larger control systems' manufacturers developed proprietary communications protocols, preventing OEMs from selecting products from other vendors and effectively 'locking' them into one manufacturer's products. In recent years, open, non-vendor specific communications have been developed such as Ethernet and Ethercat, allowing OEMs to select components that most suit their application.

This is leading to the development of guidelines and standards for control system architectures, such as those being created by the Packaging Workgroup of OMAC (the Organization for Machine Automation and Control). These guidelines will ensure the inter-operability of equipment.

***One reason that producers still use manual operations is because they are 100 per cent flexible. Can new automation systems offer similar performance?***

With the almost exponential rise in processing power automation systems have

increasingly become more flexible, especially when equipped with modern vision systems. This allows faster product changeover with reduced wastage and improved product handling, reducing damage or loss.

Automation is primarily used to provide consistency and accuracy to repetitive, labour intensive or hazardous operations. But these tasks need to be performed in sufficient volume to justify the cost.

***In which areas are the new systems most effective?***

Packaging is often the bottleneck for manufacturers. The ability to run repetitive systems without a break and to the same level of consistency is a major driver for automation of packaging operations. Product scrappage or loss can be minimised, traceability ensured and manual handling eliminated.

***Where is the 'tipping point' to make SMEs invest in this new technology?***

When deciding to invest in automation, manufacturers need to be clear about their expectations in terms of increased production, freeing up labour and improved product handling and control, and choose a system that matches these expectations.

***Where do you see the next big advance?***

Linear motors are increasingly finding favour in the micro-machining, bio-medical and research industries where dynamic performance and high levels of accuracy and repeatability are pre-requisites. As the technology matures and the costs of such systems reduce OEMs will look again at what this can offer.

These motors could cause packaging and process equipment cycle times to fall dramatically, increasing productivity and reducing on-going running costs, all within a smaller physical envelope.

*Parker Hannifin is a major supplier of automation solutions to the processing and packaging sectors.*  
www.parker.com

vision systems

# Seeing is believing!

**UK Industrial Vision Association's Don Braggins explains why vision systems are now firmly established for processing and packaging**

A tour of the PPMA Show in September last year, soon after UKIVA became a PPMA Special Interest Group, was very encouraging. It indicated that vision systems were no longer being viewed as a great new adventure but as commodity items desirable as 'factory add ons' at the end of a processing or packaging line.

This should come as no surprise when one reads the claims of Cognex, probably the best known brand in vision technology, to have sold more than half a million systems in over 30 years. The changes during that time have been immense – vision systems are now far more robust in their performance and far more economical to install and apply. Vision systems no longer cost more than coding or labelling machines whose output they are often used to check.

For the food processing industry, which always has to consider 'cleaning in place' for equipment, a big breakthrough came in 2006 when the Gigabit Ethernet standard was agreed. This allowed cable lengths well over 100 metres between a digital camera and its associated processor.

This means that the camera can be contained in a small (and therefore

inexpensive) environmentally-protected housing while the bulkier processor, typically a PC, can be housed in a normal office environment (*Figure 1*). An alternative way of achieving almost the same economy is to use a so-called 'smart camera' in which the processing is carried out within the camera housing and the output is either an 'accept/reject' signal or a small amount of data; however there are limitations on the capabilities of such devices.

At 'Vision 2009' in Stuttgart, a new standard, CoaXPress, was proposed which is as good as Gigabit Ethernet for conveying digital images over long distances. Moreover it is faster and can use the coaxial cable which has been the staple way of transmitting analogue CCTV for many years, making upgrades from analogue to digital cameras very simple.

The advantages of using digital rather than analogue output cameras are the same as for any digital alternative to analogue, e.g CD over vinyl records, with the added advantage that digital image output preserves the remarkable geometrical accuracy of the image sensor in the data, while analogue transmission



*In-Sight Micro smart vision system (Courtesy Cognex UK)*

loses it completely. This makes accurate measurement much more reliable in the digital domain and, although precision measurement may not seem important in food processing or packaging, it also means that a lower resolution and hence probably cheaper digital camera can be used in place of higher resolution analogue.

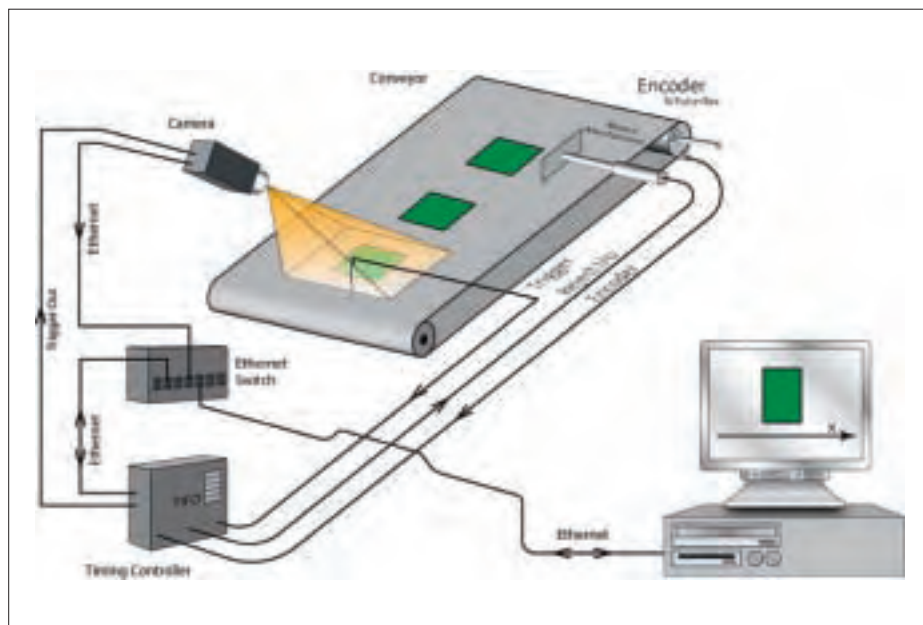
***There is now a ready acceptance of vision as an 'end of line quality check'. The next step will be to introduce vision into intermediate steps, because it is now sufficiently affordable.***

The economic advantages can be considerable, for example by preventing value being added to a half-finished product which is already unsaleable.

An early British success story for vision is an example of in-process economic advantage. Ceramic tiles are made by a process that first bakes undecorated clay to form 'biscuits', followed by the application of glaze and a second firing. If the biscuit is defective, the glaze (which is more expensive than the biscuit) will be wasted, so it is best to inspect at the biscuit stage, and discard unglazed defective items than to leave the inspection to the end of the process.

Although most UKIVA members supply imaging systems that work at more or less video rates, their products now also include infra-red systems and high-speed video, both of which can be useful in detecting malfunctions and excessive wear in all sorts of machinery. However these, especially high speed video systems, are usually short term problem solving solutions rather than being part of a production line.

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*Figure 1. Typical configuration for automatic GigE Vision image capture of items on a conveyor belt (Courtesy STEMMER IMAGING)*

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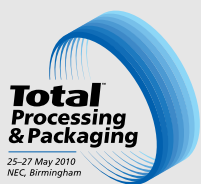
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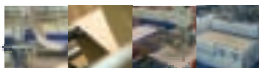


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## vision systems

# More vision with X-ray

Loma Systems makes the case for X-ray over traditional inspection methods

Vision systems are becoming the preferred choice of inspection on processing and packaging lines and are increasingly commonplace in manufacturing operations as a tool for quality assessment and process control.

The main drivers have been the requirement to improve product safety and maintain brand protection. X-ray inspection offers more complete contaminant detection as it can see and eliminate non-metallic as well as dense contaminants such as bone, stone and glass. Today's machine vision systems can accurately conduct item inspections ranging from missing components or internal fillings to verifying the volume and ratio of product within a pack. Furthermore, X-ray systems ensure all products leave the factory undamaged to meet high quality consumer expectations.

X-ray inspection systems offer a solution to metal detection in products packaged in aluminium trays, metallised films, or other materials that render traditional metal detectors

ineffective. Metallised film and foil packaging present a challenge for conventional systems but X-ray has the ability to inspect the density of the product and packaging, allowing accurate and reliable images to be viewed.

Products presented in bulk form, such as cases or euro boxes, are more difficult to inspect and will typically have a lower inspection sensitivity. Where dense materials such as glass, ceramic and porcelain are used the sensitivity may also be reduced; shape, positioning and material will determine the type of X-ray machine required.

Systems usually feature an integrated PC and touch screen to make units easy to operate, while a high speed USB connection allows product information to be accessed simply and quickly.

Several companies now offer X-ray inspection equipment as part of their range bringing the benefits of high-speed, continuous and accurate operation, and ushering in a new era for automated food processing technologies.



X4 SideShoot


Loma's X4 SideShoot X-ray system for foods allows inspection of vertically oriented packs and products such as cans, bottles or PET cartons. It operates at speeds above 600 packs/minute, can be integrated into high-speed lines and its auto-configuring algorithms eliminate false rejects.

The X4 FinePitch X-ray is suited to processors and manufacturers who require more sensitive inspection for products like chicken bone splinters.

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robotics, automation & vision

# Parallel link with more payload

Close on the heels of the introduction of its first lightweight parallel link design robot, the 0.5kg M-1iA, FANUC Robotics has launched its larger 6kg payload version, the M-3iA. Aimed at assembly and packing

operations, the parallel link structure allows it to be located in confined areas.

Its cylindrical work envelope, 0.5m deep by 1.350m diameter, is concentric to the M-3iA robot mounting base, making it

straight-forward to position and guard, says FANUC. Available in both 4 axes and 6 axes the company has produced food and pharmaceutical versions.

The 4 axes model M-3iA/6S has a hollow wrist for routing hoses through the centre of the gripper, reducing interference, hose breakages and downtime while permitting very fast work piece rotations, it says.

Applications requiring more complex positioning are suitable for the 6 axes M-3iA/6A with its



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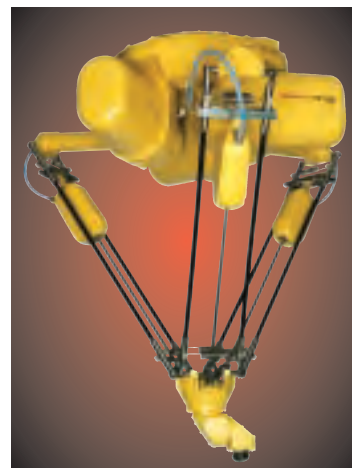


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## Italian vision

TM Robotics has formed a partnership with Italian vision specialist Tattile to provide a complete robot vision solution.

The partnership means that end users and integrators of Toshiba Machine industrial robots have the option of using Tattile's proprietary vision processors, cameras and software as part of a single, seamlessly integrated system.

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## Integrated versatile high speed picking and flow wrapping line in first UK demonstration

May's Total Exhibition will be the show case for the first UK demonstration of a new flexible Schubert high speed line.

The line, set up to handle a confectionery product, incorporates a Fuji FW3400 flow-wrapper specially manufactured to fit within the modular TLM frame of robotic packaging machinery built by German robotic specialist Gerhard Schubert.

In the demonstration the Schubert vision-controlled F44 pickers are used to pick and load three confectionery products into either a U-Card or 10 products in to a plastic tray. The U-Cards and Trays are automatically loaded into the wrappers infeed by a Schubert F2 picker. This system is capable of loading 400 single products / min into the tray and up to 300 single products / min in to the U-Card. Due to the modular design of the system with the addition of further TLM frames and F44 pickers the line throughput can be further increased.

To save space, and maintain high levels of output, Schubert's design is based on a counter-flow principle. Naked product entering on a wide conveyor belt is picked and transferred at the chosen count in to the infeed of the Fuji machine running in the opposite direction, all within the footprint of the TLM module. The robots, controlled via a quality control vision system, are programmed to ignore any misshaped or broken products thus constant quality is maintained.

This style of line is ideally suited to pack not just confectionery or food products with a change of tooling the line would be suitable for packaging cosmetics, pharmaceutical, medical devices or virtually any product which can be picked and placed automatically.



## Second Fuji System further Increases Speed and Efficiency for antibiotics test kit

Trek Diagnostic Systems, East Grinstead, has further reduced the labour cost, increased efficiency and throughput speed for packing trays of antibiotics used in laboratory diagnostic tests. The second purpose built flow-wrapping line supplied by Paramount Packaging Systems further improves the handling, checking and packing operation to maintain high quality and throughput.

Trek supplies its Sensititre brand trays to medical and veterinary laboratories, where

they are used with patient samples to determine the most effective antibiotic to counter an infection.

"Previously a considerable amount of hand work was involved, loading and unloading the trays between the dryer, labelling, addition of desiccant and flow-wrapping," explains Darren Frost, production manager at Trek. "Now the line is automated, with minimal handling of the product, the risk of contamination is reduced and the aluminium lid is no longer necessary."



After filling and drying, rows of trays are loaded manually onto the infeed of the packing line, where they are inverted by a belt conveyor system and phased using a Fuji FFS150 feeder into the flights of the main conveyor.

The first operation is print-apply labelling, to identify each tray along its side with a bar code which includes lot number, expiry date and product code. Label presence and code is verified automatically by a camera system linked to a reject system which, rejects every tray unless a positive accept signal is received.

Next, a desiccant sachet is cut from a reel and automatically placed on the tray, its presence is again verified and the tray is rejected if the desiccant is not present.

Wrapping then takes place on a Fuji Alpha 6 FW3410 BSB machine. This is an inverted flow-wrapper, with the film feed from below, allowing the trays to be handled upside down with the longitudinal seal formed above the tray.

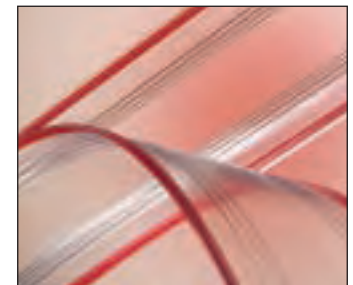
The long dwell Sealing system provides the extra dwell time necessary for secure, hermetic seals on the high barrier aluminium foil/polyethylene laminate employed by Trek. Line speed is up to 100 trays a minute.

"Reduced risk of contamination is a key advantage of the line," points out Darren Frost. "However a further benefit is that highly repetitive work has been eliminated, along with the potential for repetitive strain injury."

## Honeytop Tortilla Wraps Incorporate ZIP-PAK® Resealable Closure

Honeytop Speciality Foods has introduced a convenient new resealable packaging for its range of tortilla wraps, sold under the brand of a leading UK retailer. To this end, Honeytop bought the Fuji FW3410B Alpha horizontal flow wrapper featuring a Zip-Pak RESEAL 360XM resealable closure applicator unit from Paramount Packaging, distributor of Fuji Packaging Machinery.

Honeytop, a market leader in the supply of ethnic breads, tortillas, and pancakes throughout the UK and Europe, was the first to adopt the new technology from Paramount Packaging. "This new machine and the reclosable packaging style help us to differentiate our products on retail shelves," says David Laurence, Joint Managing Director of Honeytop Speciality Foods. "Reclosable packaging offers consumers the added flexibility and convenience they demand."



The RESEAL 360XM applicator uses the ZIP-PAK® Press-to-Close™ ZE70 (7mm) resealable closure, an easy-to-use secure seal that locks in the freshness and aroma of Honeytop's tortillas. This technology allows the product to be opened and reclosed at the consumer's convenience, maintaining quality until the entire contents are consumed. In addition, the new resealable package allows brand owners to keep valuable marketing messages in front of the consumer up to the last use of the pack. The hybrid machine is ideal for a wide range of industries including bakery, frozen and chilled food, as well as hardware and pharmaceuticals.



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## robotics, automation &amp; vision

# Firm grip on chilled and frozen food

Sigpack Systems, a Bosch Packaging Technology company, has developed a robotic packaging line, the Delta Robotics Smart Core, for the chilled and frozen food market and protein industry.

The high labour intensity usually needed to load products into trays in frozen food manufacturing is challenging due to the cold environment, hygiene requirements and the irregular shape and consistency of products. Cold conditions for the workers can lead to errors and contamination is very likely.

A new, hygienic design provides easy and safe cleaning not just for the robot, but also the complete frame, transport belts, vacuum systems and grippers, says Sigpack. All components are designed according to food regulations. And the modular design of the machine allows manufacturers to create bespoke solutions for their individual production needs.

Its basic frame is an integrated control cabinet and its height and position are adjustable. Also, being made out of welded sheet metal means it is both rigid and lightweight, to allow ease of

positioning and integration with other modules.

The further frozen products have to travel to packaging equipment the greater the possibility of the product thawing en route, which can affect the ability of the end effectors of a robot to grasp the product. The machine has vacuum suction grippers which allow food to be held irrespective of size or surface condition. Product damage is avoided through product specific design of the grippers.

Smart Core features sloped surfaces that facilitate the easy run-off of cleaning fluids. The machine is also easier to clean and inspect as there are no housings or cavities, says the company. All components coming into contact with food (grippers, vacuum pipes, and conveyors) can be detached and replaced allowing them to be 'Cleaned Out of Place'. Cleaning time is cut by 50 per cent it is claimed. In the washdown version stainless steel and only FDA-approved materials are used.

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## Line handles vials gently

An ampoule line featuring a fast and versatile ampoule feeding system has been developed by Marchesini Group to pack delicate and fragile glass ampoules, vials and capsules.

The line consists of a Farcon FB320 thermoformer, Robomaster robotic feeder, and MA255 cartoner with Robocombi robotic feeder.

Robomaster can carry out up to 80 pick-up cycles/minute. The ampoules are loaded standing upright on a vibrating infeed conveyor, the surface of which is treated with a special process that makes its sliding performance extremely fluid. This means that the ampoule 'slides' without friction and excessive forces that could cause damage. It places ampoules in the trays not only while they are stationary but also while they are moving thanks to the tracking function of the thermoformed belt.

If the line is connected directly to a machine upstream, it can store the excess products in a buffer to avoid stoppages.

The trays filled with the ampoules then pass to



the cartoning machine using the Robocombi. The trays are tracked, picked-up and placed gently in the cartoning machine bucket chain without any intermediate placing or transfer steps. This enables a totally positive transfer motion.

Giuseppe Monti, engineering director, commented: "Our robots are not 'foreign' objects that are merely 'added' to our machines, they are controlled and managed by the same control unit and are an integral part of it."

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### ON THE SIDE

When Warwick University's International Research Centre urgently needed some machine guarding for their training programme BARA member Axelent stepped in to offer help. Axelent's sales manager, Nick Hardwick, contacted Ken Young from Warwick University to offer to supply its latest machine guarding system, X Guard™.

This has been developed to ensure compliance with a new EC Machine Directive 2006/42/EC that came into force on December 29 2009.

The Centre stands to benefit from a safety element, as it had the need to separate two robots, as well as having the latest guarding fully compliant with new legislation to show in its training room, where it can be demonstrated in action.

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In a recent installation for automotive components ATM Automation's vision system needed to be capable of inspecting two variants of product, both left-hand and right-hand. Components are inspected for defects such as missing clips/screws; component colour; airbag retaining bolts. ATM claims its system is adaptable to other products including pharmaceutical components.

Designed with a manual and automatic function, it comprises 3 high resolution camera systems with LED array lighting linked to a graphical user interface screen. The inspection results and images per part are displayed graphically. It is also linked into the factory network/Scada system. All data is backed up to provide full product traceability.

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robotics, automation & vision

# ‘Look no hands’ for microwave wrap



## Double Delta for cereal bars

Cama has perfected a packaging system for a major bakery company using its latest double Delta ‘Triaflex’ robot. This represents another step forward for Cama’s range of ‘custom made’ robots, says the company.

Cereal bars arrive at 650/minute and are loaded on edge and flat into an electronic cartoning machine by the two Delta robots before being packed in cartons at 170 packs/minute.

Triaflex reaches a speed of 150 cycles/minute. It can function on single and double line tracking systems, and can be used to carry out tasks that are particularly complicated, such as managing and loading products on continuous motion machines.

Coupled with an ‘intelligent’ vision system the robot can work in three dimensions, with 360° head rotation, picking random products from the production line belt and positioning them accurately.

It is also equipped with four controlled axes and carbon fibre arms for gripping or placing products in all positions.

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An end-of-line palletising system from Smurfit Kappa Machine Systems, incorporating a new FANUC Robotics M410iB palletising robot, is now operating at the Panasonic microwave oven plant (PMUK) in Cardiff.

The plant had moved towards Cell manufacture and away from flow-line operations which meant increased levels of manual operation, as the existing equipment proved unreliable.

Daniel Humphrey, PMUK’s home appliance manufacturing general manager explains, “There are eight manufacturing cells producing over 300 variants of microwave. These were manually transported from each cell to a palletising area where manual operators used lifters to stack the ovens and then manually wrap them. The problem was that this involved three to four people collecting many products, in 10 different sizes, from several locations.”

Smurfit Kappa designed and installed a conveyor system to collect from each cell. These merge into a single conveyor taking all ovens to a palletising area where first they are identified by a single bar code reader and then directed to one of eight holding conveyors. When a holding area has sufficient ovens to complete a pallet the ovens travel to the palletising pick up location. The system PLC provides the palletising pattern and quantity details to the FANUC robot.

Smurfit Kappa also developed a gripper to accommodate all oven variants (15kg to 35kg). The robot picks up two ovens and places them in



the correct pattern to optimise pallet size. Average time to complete a pallet is one minute.

“We now have just one operator in the palletising area and there is no lifting. The system has been designed to be straightforward and it works effectively,” concluded Humphrey.

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## Faster vision with new platform

Demand for high speed vision systems capable of delivering accurate results in a simple format and without false waste has led Olmec to develop its Simple Vision Platform (VP2). Primarily for use in medical, pharmaceutical, food and consumer industries it utilises powerful code reading algorithms and provides a user friendly, self-sufficient menu driven system, says the company.

This means that inspection of unstable items can now be handled successfully thanks to the increased sensitivity of cameras, more robust software algorithms, and increased processing power that enables faster inspection. Based on

Omron’s Flexpect Vision Platform, operators can learn to use the system in less than 20 minutes. There is no need for character code training, while for bespoke applications the operator interface is supplied with a specific menu. The system provides maximum uptime and minimal set up time, says Olmec.

Applications include code verification and 2D barcode reading; complex multi camera line scan systems detecting defects on difficult to image products; and automation combined with vision.

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