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Vision adds value

Industrial inspection applications for quality control have underpinned the evolution of the vision industry throughout its history. Although more recently vision has expanded into a myriad of other application areas from traffic control to sports coverage, manufacturing applications are still hugely important.

Vision technology and equipment covers a multitude of applications, adding real value to the manufacturing process. Applications range from the measurement of product and components during manufacturing, to the inspection of the integrity of packaging to the reading and verification of print, barcodes and labels.

So vision is now an enabling technology and this means that the vision industry has to satisfy a variety of customers. Those who are 'vision aware' take a greater interest in the specifications of the components and system and how they work, while a quite different group of people will be interested only in how vision can solve a particular manufacturing problem rather than the technology behind it. This provides vision suppliers with a challenge of how best to satisfy these different types of customers. Although the internet is an accepted method of keeping up to date with new developments, there is no substitute for seeing vision systems in action, so trade shows are still hugely important.

For the vision engineers, Europe's largest specialist vision show, appropriately named 'VISION' and held in Stuttgart,

Germany, has just gone from an annual to two year cycle to reflect the longer innovation and development cycles for many vision products. The UK does have its own annual vision-related show, PHOTONEX, which is held in Coventry in October. With vision in use in so many different industries, however, many companies in the UK now prefer to exhibit at industry-specific exhibitions in areas as diverse as processing, packaging, traffic, food, design, manufacturing and security to name just a few.



Typical machine vision measurements

The TOTAL Processing and Packaging show at the NEC, Birmingham 4-6 June is a good example. Visitors are expected to include people looking for vision technology components to use in their own products or plants; people looking for system integrators or consultants to help them solve their vision applications and installations and people who will be looking for complete processing or packaging systems that may very well have a vision system built into it. This profile matches well with the UKIVA's membership and this is reflected in the considerable commitment of UKIVA members to exhibit there, including Alrad Imaging, Clearview Imaging, Cognex, Leuze Electronic, Olmec UK, Omron, Sick, Stemmer Imaging and UPM Conveyors.

CONTENTS

Foreword	2
Members News	3-8
Members Directory	10
Application Articles	11-15
Technical Tips	16

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FOREWORD by Mark Williamson



The first issue of 'Vision in Action' for 2013 sees UKIVA members concentrating on the more 'traditional' uses of vision for inspection applications in the manufacturing sector. Continuing developments in vision technology improve the speed, accuracy and complexity of measurements that can be made. Two new data transmission standards have recently emerged which will further extend the capabilities of machine vision.

The CoaXPress standard was developed especially for machine vision applications by a consortium of camera and frame grabber vendors. Utilising coaxial cable for data transmission, CoaXPress is characterized by its ability to transmit much more image data than the current Camera Link® and GigE Vision® interface standards, and over distances between 40m and 100m (without the need for repeaters) depending on data rates.

The USB3 Vision standard makes use of the recently introduced USB3.0 interface for the mass market. Improved data transfer rates of up to 400 Mbyte/s and the fact that no framegrabber is required has led to a wide range of low cost USB 3.0 cameras coming to market.

These new standards will no doubt open up new applications for vision as well as allowing improved performance in current applications. UKIVA members who are vision technology suppliers and vision systems integrators will be in an excellent position to guide end-users and OEMs to the optimum solution. They can offer experience with either their own CoaXPress or USB 3.0 products or products from the world's leading manufacturers so they will be happy to advise potential users on the best route to take.

Finally, congratulations go to Olmec UK who won the inaugural UKIVA award for 'Most Innovative Machine Vision Project'. This was for the development of a vision system for the final inspection of ear drop dispensers prior to packaging at Thornton & Ross, the largest independent manufacturer of 'over the counter' healthcare products in the UK. This year's award winners will be announced on June 4.

Mark Williamson, UKIVA Chairman

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ALRAD IMAGING

www.alrad.co.uk

ELiIXA+ 8K/4K pixels CMOS line scan camera

e2v's next generation of line scan cameras, featuring new multi-line CMOS technology, is an inexpensive alternative to TDI CCD line scan cameras. It provides an unmatched 100,000 lines/s and delivers high signal to noise ratio even when short integration times are required or when illumination is limited.

The 5µm pixels are arranged in four active lines, ensuring optimal spatial resolution in both scanning and sensor directions with standard F-mount lenses. Vertical and horizontal binning functions allow the camera to be operated as 4 active CMOS lines (8,192 pixels, 5µm x 5µm pixels), or 2 active CMOS lines (4,096 pixels, 10µm x 10µm pixels).



ELiIXA+ 8K/4K pixels CMOS line scan camera

EyeVision – smarter imaging software

EyeVision is a complete image processing package for every possible application. It connects powerful software and easy installation on a standard Windows PC with a wide range of hardware for image capture and digital I/O. Easy 'Drag-and-Drop' programming allows all industrial inspection tasks to be carried out quickly and effectively without previous knowledge, allowing custom made solutions for various applications.



Drag and drop programming

EyeVision is suitable for all hardware platforms including vision sensors, smart cameras and PC-platforms with GigE Vision, USB, Firewire and CameraLink interfaces. EyeVision supports all 32Bit Windows-solutions as well as all 64Bit operating systems such as Windows x64 and also Linux x64. Software for OEM instruction sets and a powerful BASIC Interpreter are also included.

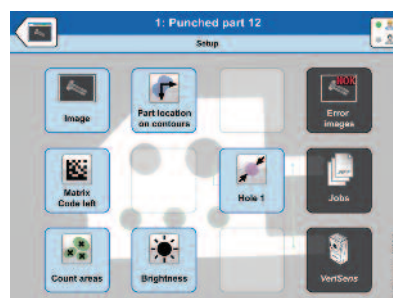
BAUMER

www.baumer.com

New VeriSens® web interface

A new generation of Baumer's VeriSens® web interface makes it easy to reconfigure vision sensors. For the first time, users can combine application-related parameters in a user configurable menu. Access is possible across all operational systems via a standard web browser without plug-ins.

Up to 32 different feature checks can be simultaneously run within one job with the VeriSens® vision sensors. Up to 9 of these features can be freely selected in the web interface and presented to the machine operator for reconfiguration. This considerably reduces procedural complexity and allows even inexperienced users to perform individual adaptations. The web interface will be available on a cross-series basis for all new VeriSens® models of the ID, CS, XF and XC series. A software update is available for current users of Baumer vision sensors.



VeriSens® web interface

New Member For UKIVA Management Committee

We are delighted to welcome Julian Parfitt, Managing Director (UK) of Framos Electronics Ltd, onto the UKIVA management committee. Julian joins Mark Williamson (Stemmer Imaging), Ian Alderton (Alrad Imaging), Julie Busby (Multipix Imaging), Paul Wilson (Scorpion Vision) and Dr. John Haddon (Panther Vision) on the committee at an exciting time for the UK Vision industry. The committee's role is to steer the Association along the path that will benefit manufacturers, vision component suppliers, system integrators and end users alike.



Julian Parfitt

Julian has a wealth of experience in the image processing field, and perfectly complements the current committee structure. Julian has been in charge of the UK operation of Framos since 2003 and is also responsible for the Framos GmbH Group international business development in the Asia Pacific region. Prior to joining Framos, he gained many years experience in the CCD sensor and LCD display technology sectors in senior management positions within Sony Semiconductors, Hitachi Electronics and Toshiba.

UKIVA contribution to vision recognized

The UKIVA was presented with a small token of appreciation for its 20 years contribution to the vision industry at the VISION Show in Stuttgart, Germany. The award was made by the VISION Show organizing committee at a dinner celebrating the show's own 25th anniversary. Mark Williamson, UKIVA Chairman said: "It was an honour for the Association to be acknowledged publicly and particularly rewarding to see that our efforts, which are concentrated on the UK vision industry, have been recognized on an international stage."

Updated membership information

A new membership document is available for download at www.ukiva.org/join.html. It covers all the key Association activities such as exhibitions, publishing and web, annual directory, newsletters and networking events.



Reading codes on product labels

COGNEX

www.cognex.co.uk

DataMan readers are powerful upgrade for small laser barcode scanner systems

Small in size but exceptional in performance, the DataMan® 50L is designed for 1-D oriented barcode reading and measures just 23.5mm x 27mm x 43.5mm with an IP65-rated housing. It is ideal for mounting in very tight spaces on production lines and in machinery. The DataMan 50L is equipped with Hotbars™, a proprietary image analysis technology that delivers the highest read rates of 1-D linear barcodes, including those that are damaged, distorted, blurred, scratched, low height or low contrast.

The DataMan® 50L can improve read rates, especially for damaged barcodes or barcodes printed on reflective or pliable surfaces and delivers read rates that can surpass 99%. It is possible to analyse "no reads" by letting the user see what the reader sees, either live on a monitor or through image archiving. A three-position lens and an integrated aimer are provided for easy setup at different working distances. There are no moving parts that can become worn out and require replacement.

FRAMOS

www.amos.eu

Sunex HDR lenses

The HDR range of lenses from Sunex is especially designed for use with Wide, or High Dynamic Range (HDR) image sensors. These lenses cut down on stray-light phenomena such as ghost images, flare, veiling glare, starbursts, etc. which would be visible to an HDR sensor. Sunex is a pioneer in HDR-optimized board-mount lens design (DSL946, DSL947) and has a proven track record throughout industrial, security, and in-car applications. Optimal lens performance is achieved through a combination of sophisticated modelling techniques, proper lens design architecture, filter choice and materials processing.



Sunex HDR lenses

MATROX VITE

www.matrox.com/imaging

Supersight Solo high-performance computing platform

This low-cost addition to the Matrox Supersight family of industrial imaging computers harnesses the full power of today's multi-core CPU, GPU and FPGA technology. Designed for computationally-demanding industrial imaging applications, Matrox® Supersight Solo™ lets users integrate a powerful system host board with multiple GPUs, FPGAs and frame grabbers in a single robust chassis.

Matrox Supersight Solo lets OEMs and systems integrators maximize compute density in a 4U chassis with up to thirteen PCIe® 2.0 x16 slots. It also enables increased data bandwidth with dual PCIe 2.0 x16 host interfaces. The included system host board is equipped with one or two multi-core embedded Intel® Xeon® processors. Applications for Matrox Supersight Solo are developed using the Matrox Imaging Library™ which includes tools for every step in the process: from application feasibility, to prototyping, through to development and ultimately deployment.

METTLER-TOLEDO

www.mt.com

Vision inspection white paper for beverage manufacturers

Beverage manufacturers can learn about the value of vision inspection solutions with Mettler Toledo's white paper – How to Ensure your Beverage Package Quality. Inspecting for defects such as improper fill levels, labelling errors, broken seals or chipped bottles, CI-Vision solutions provide manufacturers with a 100% detection method for damaged beverage packaging. By placing the inspection equipment at critical points throughout the manufacturing process, this sophisticated technology performs high speed inline inspections with the minimum of maintenance and operator training.

The white paper also discusses the advantages offered to manufacturers packaging a variety of products as it performs automated product line changeovers. The white paper can be requested on line at the Mettler-Toledo website.

CI-VISION
white paper





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Classification of apples

Inline inspection of bulb filaments, contact pins and print quality



MULTIPIX

www.multipix.com

New 'classifier' tool for Halcon machine vision imaging software

Halcon machine vision imaging software features a new, easy to use 'k-NN classifier', a tool that makes it possible to train a classifier in a very short time with only a few training samples. Classification-based solutions can solve many machine vision problems simply. The new algorithm in MVTec's Halcon11 can address applications that require the 'power of deduction' that have until now been extremely resource intensive to solve if not impossible.

Natural organic products are always a challenge as they have natural variations yet they belong to the same 'class' of product and so the machine vision system must classify them accordingly. For example, two apples from the same variety may have different appearances yet they belong to the same 'class' of product and the machine vision system must be able to accommodate this. Halcon11 can now handle such applications with greatly reduced development time, extending the use of machine vision into new and diverse areas.

The new 'k-NN classifier' can also be used to efficiently identify points in 2D or 3D point clouds that are closest to a given query point. For example, in robotic applications it can be applied to compute the distances to 3D objects in real-time, essential for collision avoidance systems.

Datalogic Smart series of cameras

The use of vision based systems is increasing throughout a large variety of vertical market sectors as production teams deal with the demands of increasing throughput, maintaining quality and reducing waste.

Datalogic Industrial Automation offers a complete family of high performance smart cameras and embedded machine vision systems, all utilising 'Impact Software'. Reaching both new and established vision users, the Impact Software suite is a powerful and versatile programming toolkit that delivers advanced inspection capabilities through two key software components - Vision Program Manager and Control Panel Manager. Over 100 tools, such as image filtering, product location, feature find, measure and flaw detection make it more attainable for engineering companies and OEM's alike to harness the power of machine vision.

Applications are developed and flexible powerful solutions are created using a drag and drop programming style within Vision Program Manager (VPM). This allows cost effective solutions to be created in a relatively short space of time. The Control Panel Manager provides an intuitive drag and drop configuration environment. It is a fast and powerful way to create a customized user interface for production line management and configuration of the inspection system while the program created in the VPM runs in the background.

MULTIVAC UK

www.multivac.co.uk

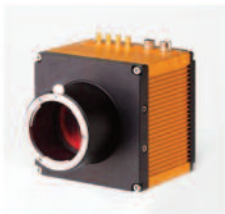
Inspection systems

Multivac Marking & Inspection has built inspection systems from various manufacturers into its labelling and marking systems as standard practice as well as having its own Multivac Vision System (MVS). The MVS is an innovative image processing system suitable for a wide range of detection and inspection applications. It allows 100% quality control in automated packaging lines with maximum accuracy, even at high speeds.

The hygienic design meets the strictest requirements for use in the food, consumer, industrial and medical sectors. MVS can be integrated into automated packaging lines including all Multivac automation components and IPC-controlled packaging machines and is also available as a separate unit with its own operating terminal.

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MEMBERS NEWS

OLMEC-UK

www.olmec-uk.com

Quality Station turnkey vision inspection systems

The QS and QS+ are part of the new 'Quality Station' range of turnkey vision inspection systems. With a footprint of just 1.2 m x 0.7 m, they are easily added to the manufacturing environment to provide inline inspection. Featuring an integral transport and reject mechanism, they can be used independently or in conjunction with other quality inspection tools such as checkweighers.

They can accommodate product up to 300 x 300 x 500 mm size and 6 kg weight at rates up to 60 m/minute. Typical applications include checking for product assembly completeness, colour or defect analysis, as well as label inspection including code reading. The QS+ can also inspect product from below.



Quality Station turnkey vision inspection system

A range of cameras, lighting and reject mechanisms are available. Vision experts from Olmec discuss the application in detail with the end-user before selecting the most appropriate components and setting up all the inspection tools needed. A rigorous and fully documented off-line testing and acceptance programme prior to installation ensures risk is mitigated for the user.

RNA AUTOMATION

www.rnaautomation.com

RNA expands engineering capabilities

RNA has invested in a new CNC-controlled milling machine to accommodate growth in disciplines including robotic vision systems, automated assembly systems and vision inspection machines. The new Haas CNC milling machine delivers the benefits of a high degree of accuracy, repeatability and an overall improvement in consistency and quality. With a number of new projects in the vision inspection machine sector, the added engineering capacity is needed to meet customers' needs for effective, timely project execution. RNA has supplied over a dozen high speed inspection systems to one customer alone during 2012.

The company is also implementing the latest global communications technology to improve project management and client communications. After a successful trial, RNA is planning to roll out this new system as its central online communication platform and a key tool for managing all "live" projects. Customers will have a secure "real time" access to project progress from any computer with an internet connection as well as most mobile devices.



RNA's new CNC milling machine

FRAMOS

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GEVA300 compact vision system



Compact image sensors

SCORPION VISION

www.scorpionvision.co.uk

Scorpion Basic Plus compact vision system

The Scorpion Basic Plus is the first in a series of Scorpion Compact Vision Systems and is targeting cost-effective 2D robot vision, assembly verification, identification and sorting. The system is aimed at OEM and system integrators that want a professional configurable, low cost and rugged multi camera system. At the heart of the system is the very latest release of Scorpion Vision Software Version X with new Metro look and the best Windows compatibility.

The package consists of Scorpion Vision Basic Plus (an enhanced version of Scorpion Basic designed to make accurate 2D Robot Vision), a Scorpion Compact PC (a robust solid state, fanless PC with flexible expansions slots) and 1 – 4 digital firewire or GigE cameras from Sony. The system can be connected to other devices with digital io, rs-232, modbus and tcp/ip. In addition a selection of Scorpion Vision Apps is included in the package to make it easy for the user.

STEMMER IMAGING

www.stemmer-imaging.co.uk

Low cost multi-camera vision inspection system

The new GEVA300 compact vision system is a scalable, low cost multi-camera vision system. GEVA300 supports up to 6 GigE Vision cameras coupled to an Intel® dual-core ATOM™ architecture for image processing and measurement for a wide range of inspection applications. It is suitable for end users or vision integrators across all the traditional vision inspection industries.

Six high bandwidth GigE ports are provided which are compatible with a wide range of GigE cameras, which can be mixed to suit the application need. Camera expansion is easily accommodated using commercially available network technologies, allowing large configurations to be realized with much lower system cost.

Vision solutions are setup using iNspec or Sherlock application software. The iNspec software requires little or no prior vision experience, while Sherlock offers greater flexibility to tackle more challenging inspection tasks. Both packages offer a wide selection of tools and capabilities for applications requiring positioning, identification, verification, measurement, and flaw detection.

The small, rugged, fanless construction tolerates harsh factory conditions and varying temperatures. An optional PL-USB companion module offers I/O expansion and easy integration of up to four additional Teledyne DALSA Genie cameras.

Strategic partnership with Mitsubishi Electric Europe

Mitsubishi Electric Europe has chosen Stemmer Imaging as strategic partner for the distribution of Mitsubishi Electric Europe's Contact Image Sensors (CIS) throughout Europe. The new KD series of contact image sensors is the first that Mitsubishi Electric Europe have produced targeted at the machine vision industry.

The CIS colour quality and very high scan rates can be used in applications in all areas where flat objects and materials are to be tested quickly and with high resolution, e.g. for the inspection of printed circuit boards, printed matter or LCD panels.

The use of the integrated tri-linear sensors with filter-on-chip and white LED illumination is unusual in industrial CIS products but is proven in existing line scan cameras. The products feature scan widths of 309, 617 and 926 mm and have a colour resolution of 600 dpi and a working distance of 12 mm. The line rate of 23 kHz allows scan rates of 960 mm/s equivalent to 44 µs/line. The Contact Image Sensors supply data in both 8- or 10-bit formats over a configurable Camera Link output.

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VISION



USB3 + CCD



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2.8 MP*	Sony ICX674 CCD	2/3"	4.54 μ m	1932 x 1452 at 26 FPS	Available Q2 2013
6.0 MP*	Sony ICX694 CCD	1"	4.54 μ m	2736 x 2192 at 13 FPS	Available Q2 2013
9.2 MP*	Sony ICX814 CCD	1"	3.69 μ m	3376 x 2704 at 9 FPS	Available Q2 2013

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MEMBERS DIRECTORY

VISION TECHNOLOGY PROVIDERS

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ClearView Imaging Ltd www.clearviewimaging.co.uk T 0845 606 0457	ClearView Imaging is a supplier of vision components, including a wide range of cameras, frame grabbers, software, embedded systems, smart cameras, vision processors, lighting and optics.
Cognex UK Ltd www.cognex.com T 01327 856040	Cognex is the world's leading vision company, with over 150,000 systems delivered. We offer a complete range of vision solutions, from smart cameras to powerful framegrabbers.
Framos Electronics Ltd. www.framos.co.uk T 01276 404 140	Framos is a specialist distributor of digital and electronic imaging devices and complete cameras. Both area and linear CCD and CMOS devices are offered with full technical support for design and integration.
Imperx Incorporated www.imperx.com T +1 561 989 0006	Imperx, Inc. was founded in 2001 by a seasoned team of senior executives with a proven track record in developing advanced digital imaging products. Imperx designs, develops and manufactures state-of-the-art imaging products for a variety of markets.
Lambda Photometrics Ltd. www.lambdaphoto.co.uk T 01582 764334	Lambda Photometrics distributes a broad range of machine vision products. These include fibre & LED lighting, lens systems, cameras (CCD, linescan, smart CMOS), framegrabbers & software.
Leuze electronic Ltd www.leuze.co.uk T 01480 408500	Leuze electronic 'the sensor people' are the experts for sensors. They also specialise in smart cameras and identification products.
Matrox Vite Ltd www.matrox.com/imaging T 01895 827281	Matrox Imaging is a leading designer & manufacturer of PC-based hardware & software for machine vision, image analysis & medical imaging drawing on an unparalleled 25 years of industry experience.
Multipix Imaging Ltd. www.multipix.com T 01730 233332	The wide range of products offered includes frame grabbers, cameras, lenses & imaging software together with a highly experienced support service.
National Instruments UK Ltd. www.ni.com/uk T 01635 523545	National Instruments manufactures hundreds of integrated software & hardware products, which are used to replace &/or communicate with traditional instrumentation.
Omron Electronics (UK) Ltd www.omron.co.uk T 01908 258 258	Omron Electronics manufactures a wide range of vision-based industrial solutions, ranging from cost effective vision sensor products to high-end vision controller and camera products.
Scorpion Vision Ltd www.scorpionvision.co.uk T 01590 679 333	Scorpion Vision Ltd is the UK representative of Tordivel AS of Norway. Founded in January 2006, the company has the remit to promote, advise and manage sales and support of Scorpion Vision Software.
Sick (UK) Ltd www.sick.co.uk T 01727 831121	IVP offers cameras for high-speed 3D machine vision for OEMs and vision integrators. IVP's 3D technology can replace or complement traditional 2D inspection. The outstanding performance is a result of a proprietary CMOS sensor technology.
Stemmer Imaging www.stemmer-imaging.co.uk T 01252 780000	The premier UK machine vision components distributor providing leading vision technology, advice and development services to OEMs, integrators and corporate customers.

VISION SYSTEM INTEGRATORS & CONSULTANTS

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FS Systems LLP www.fssystem.co.uk T 01933 625162	FS Systems is a UK specialist in machine vision. Our product range covers, Vision & Control machine vision components, and GenVis and RoboVis PC-based vision systems and vision training.
Loop Technology Ltd www.looptechnology.com T 01305 257108	Loop Technology Ltd provides development and integration services for automated processes involving machine vision systems and/or motion control systems. They produce automation systems for the electronics, automotive, printing and packaging industries.
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Stein Solutions Ltd T 07787 568307	Stein Solutions provide inspection and optical sorters.
UPM Conveyors www.upmconveyors.co.uk T 01753 548801	UPM Conveyors provide complete automated conveyor & vision systems

ALRAD IMAGING

www.alrad.co.uk

Automated optical inspection system utilizing CoaXPress

Electronics manufacturers must invest in automated solder paste inspection and automated optical inspection (AOI) equipment in order to maximise efficiency and acquire quantitative information that may be used to streamline the manufacturing process and reduce manufacturing defects. By increasing first pass production yields, manufacturers are able to decrease costs, save time, and reduce the need for non-value added rework and repair. A new AOI system, featuring high resolution cameras and using the newly introduced CoaXPress (CXP) data transmission standard, has been proven to increase throughput by up to 500% thereby maximizing production efficiency and return on investment. The new AOI system, developed by MIRTEC, combines 25 Mega Pixel 2D Inspection with advanced Digital Multi-Frequency Moiré 3D inspection to provide precision inspection of SMT devices on finished PCB assemblies.

Systems may be configured with a state-of-the-art CoaXPress 25 mega pixel top-down camera system for exceptional 2D inspection speed and accuracy and four 10 mega pixel side-view cameras. The side view cameras may be used to inspect part markings and other regions of interest that are inaccessible with the top down view camera. This is particularly advantageous for thru-hole applications. CoaXPress camera technology is capable of providing data transfer rates of 25 Gbit/Second. The combination of the ultra high resolution cameras with CXP data transfer rates makes testing quicker and improves accuracy since there is no need to stitch together multiple images. An advanced six phase lighting system uses multi color LEDs to illuminate inspection areas from six different angles to provide superior solder joint characterization and co-planarity inspection of leads on gull-wing devices. True 3D inspection of SMT devices on finished PCB assemblies is achieved using a total of four Moiré inspection probes. This proprietary system yields precise height measurement used to detect lifted component and lifted lead defects as well as solder volume post reflow.

A comprehensive Package Type Library provides simple "Drag and Drop" component programming. The Automatic Teaching Tool (ATT) software provides automatic teaching of component locations using CAD centroid data. Typical programming time is under one hour per assembly.



25 megapixel CoaXPress camera from ISVI Corp

MULTIPIX

www.multipix.com

Visibake gives confidence, consistency and quality to baked goods

Potts Bakery Pty, based in Australia has become famous for its sourdough and speciality loaves. A recent expansion strategy extended manufacture to include hot cross buns. Potts recognised they faced two key challenges if they were to breakthrough with the major retailers; firstly, to demonstrate a proven track record of consistent delivery of the stringent, high quality standards demanded. Secondly, Potts need to drive a step change internally in both manufacturing quality performance and quality focus within the Bakery Unit. The VisiBake product from Omni Machine Vision, UK offered a simple and unique solution to this challenge. Potts installed and commissioned the units complete with a bespoke option specifically designed for the inspection of hot cross buns.

Visibake inspection capabilities include:

- Monitoring and reporting of the bread bake colour
- Common 'defects' in bread products that detract from the visual appearance of the product
- Height measurement resolution of +/- 0.3 mm on selected area of interest

For hot cross buns, the system also identifies poor crossing quality and centralisation, colour and cross variation and poor cross centralisation on hand crossed buns. These all detract from the visual appearance of the buns.



Good and bad crosses on hot cross buns

APPLICATION ARTICLES

With a food grade stainless steel construction, minimal crevices and full, wet wipe down of all exposed working surfaces, the standard system uses an industrial 16" full colour touch screen control rated to IP65, which is capable of storing >3 million PDF product reports. The heart of the image processing is based around the powerful Halcon machine vision library supplied by Multipix Imaging Ltd. Multipix has since signed Omni Machine Vision as a Halcon Certified Integration Partner. The new system was used as the key driver for change in quality performance across the whole of production using the accurate and consistent measurable data and trends as the basis for baked product quality, consistency and operational performance improvement.

Not only has the improved quality allowed Potts Bakery to win an order for 15 million buns compared to 340,000 sold the previous year but also it has reduced the incidence of customer returns and return claims.

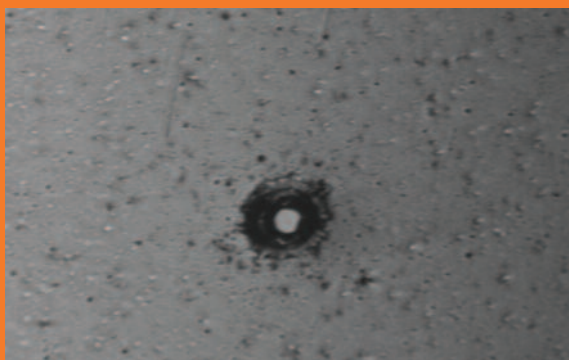
OLMEC-UK

www.olmec-uk.com

High speed web inspection for laser-machined holes

Olmec-UK has partnered with web handling specialists, Universal Converting Equipment Ltd, to produce a vision system capable of real-time measurement of laser machined holes in film. The vision system is mounted directly onto the web, which runs at 350m/min. Lasers are used to perforate the extruded web material with hole sizes from 30 – 120 μm depending on the particular requirement. The vision system must check that each hole is present and measure it to ensure it meets specification, and must be capable of working on pre-printed or plain films.

Given the size of the holes, the speed of the web and fluctuations in the speed of the web, the correct triggering of the camera, imaging and illumination is extremely challenging, and any component which can add delay



60 μm laser machined hole imaged at 350 m/min web speed

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Scorpion Vision introduces a new range of USB3 databus products.

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must be bypassed. Four lasers are spaced across the web, with a camera at each laser position to make a measurement. Each camera was configured with 2.5 mm field of view, meaning that each camera pixel corresponds to 2 μ m. The speed of the web means that over 5mm of film passes through the field of view every millisecond. The system must process the data from the 4 cameras in less than 20ms to keep up with the web manufacturing speeds.

The time at which the laser fires to make a hole is locked against a high resolution encoder to allow a specific distance to be counted before triggering the camera and light. However a number of other factors influence the exact triggering position. Key to the success of the project was the development of a proprietary algorithm which searches for the hole but disregards imaging locations with no hole features. This algorithm controls the encoder input so that the hole can be found and once found, its position tracked. This enables the system to know whether to trigger earlier or later. This algorithm also provides the operator freedom to add or reduce web tension which also impacts the trigger location. Four channel lighting control of blue spot lights provide a reliable and repeatable light output. An algorithm was also developed to find the holes in noisy images based upon the target hole size entered in to the laser system. This helps avoid detecting background noise as a hole feature.



OMRON

www.industrial.omron.eu

Automated spigot assembly

A leading automotive parts manufacturer is using a solution based on an Omron SCARA robot, used in conjunction with a vision system and other automation products for the automated assembly of an injection-moulded plastic spigot.

The assembly process involves fitting four compression limiters of two different sizes to the spigot. The limiters have to be accurately positioned and pressed into place to a precisely defined depth. Once fitted, they have to be retained with a specified force. The final stage of the process is to carry out a leak test on the completed spigot assembly to verify not only that the limiters have been fitted correctly, but also to check the integrity of the part itself.

Industrial automation expert, ALPHR Technology, proposed a machine with a PLC-controlled rotary assembly station, which would produce one finished part every 20 seconds. This solution is based on an Omron SCARA robot with a vision system. The operator manually loads a part into one of the "nests" in the machine's rotary assembly table. A pneumatic cylinder pushes the part fully home and then the table indexes. Next, the robot takes the four compression limiters, one at a time, from vibratory feeders and places them into the part.

Two Omron FQ vision sensors confirm that the limiters are all present and correctly positioned, and then the table indexes again, moving the part to a station where the limiters are inserted with pneumatic cylinders and then a force push out test is carried out. The table indexes once more to bring the part to the final station where it is pressurised and tested for leakage. Depending on the results of the test, the part is transferred either to the pass bin or the fail bin, configured to ensure that defective parts can never be accidentally mixed with good products. Passed and failed parts are automatically counted, and the machine notifies the operator when the bins are ready to be emptied. The percentage of reject parts produced by the new machine is greatly reduced, as the dependable robotic placement of the compression limiters and the 100% inspection by the vision sensors make it virtually impossible for incorrectly assembled parts to go forward to the final testing stage.



Automated spigot inspection system



Sentinel screenshot

SCORPION VISION

www.scorpionvision.co.uk

Sentinel App keeps tabs on a beer canning palletiser

A large UK canning plant wanted to monitor an unmanned palletiser station in the factory. The palletiser is a large machine that receives beer cans at the end of the production line and stacks them automatically onto a pallet before wrapping and making ready for a forklift.

The canning plant consists of two large warehouses, one containing the palletiser line and the other where the canning process is completed, and where most of the staff are located. Unfortunately, the palletiser can stop for a number of different reasons and the reasons behind a stoppage are not always obvious.

Running with a small number of operators to optimize efficiency meant that the canning line required a cost effective method of monitoring the palletiser to not only view the line remotely but to also allow historical viewing of the key elements. Off-the-shelf CCTV recorders have limitations both in image quality and automation capability.

The specification was for a real-time digital recorder, with zero image compression, that could record at up to 30 frames per second from 4 cameras, controlled by the palletiser itself. With so much data generated, a method was also required of post processing the image frames into a video file so that the previous 30 minutes could be reviewed at leisure.

This requirement led to the development of the Scorpion Sentinel App. Equipped with four Sony XCG-V60 VGA Gigabit Ethernet cameras located at strategic points on the palletiser system, the App was created with innovative video processing routines that would stitch together images from all four cameras and save each sequence in a video folder ready for preview on demand. In addition, the App is controlled from the palletiser plc through a digital I/O that starts and stops recording in sync with the production line. As the normal operation involves many periods of waiting, it is important only 'live' data is recorded.

The output is efficient parcels of video data, recorded at relevant points in time, archived by time and date. So now, when the palletiser stops for no apparent reason, a video file can be reviewed to find the moment in time when the incident happened. It is then possible to investigate further by finding the corresponding high quality, uncompressed video frames from any of the cameras at that time.

Scorpion Apps are a suite of products from Scorpion Vision Software that undertake specific tasks. They are defined by their straightforward interfaces with an easy to use GUI.

STEMMER IMAGING

www.stemmer-imaging.co.uk

Automatic monitoring of chocolate bars

Stemmer Imaging has worked closely with image-processing specialist Kdorf Automation, based in Kempen, Germany and the Lower Rhine University to develop an automatic system for random sample testing of chocolate bars. The particular challenges posed are the hygiene requirements and the irregular shapes of the chocolate bars. Sweet manufacturers need to be able to carry out checks on the geometry of the bars to ensure that they conform to the specifications.

The system features a plastic-coated stainless-steel carriage, which provides the adhesive friction necessary for transporting the bars and is very easy to clean. The operator can then choose the type of bar in a drop-down menu, which automatically sets all specific parameters for the bar, e.g. dimensions, tolerances and greyscale transitions.



Look for UKIVA and several of its members on Twitter.
<http://twitter.com/ukiva>

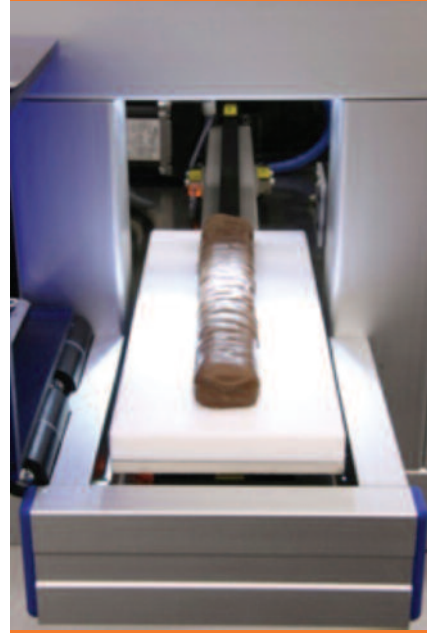
APPLICATION ARTICLES

The imaging system features two linescan cameras equipped with telecentric lenses to record plan and side views of the chocolate bar. Stemmer Imaging supplied all of the imaging components including cameras, lenses, framegrabbers, lighting and the Common Vision Blox Foundation Package imaging toolkit. An integrated linear system accelerates the bar over a few centimetres, after which it is then moved with constant speed between the two cameras.

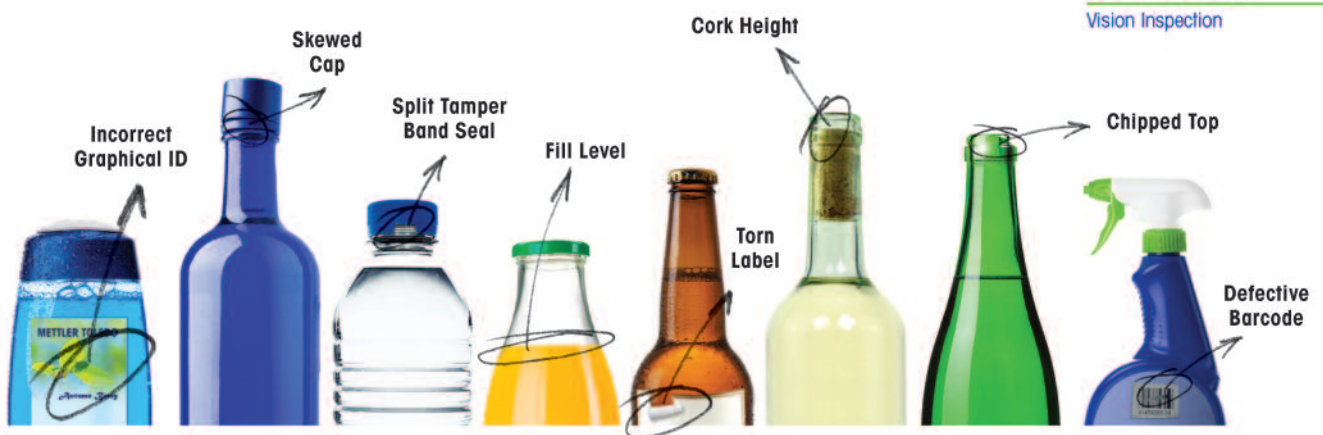
Measurements are made to an accuracy of 100 µm. Images of the bars are displayed along with the maximum recorded values for length, breadth and height. These are marked red or green to show clearly whether the test results lie within the required tolerances. Because of the irregular surface structures, several hundred points on the bar are measured, depending on the size of the bar.

The software can compensate for inexact insertion of the test objects. If a bar is laid askew on the tray, the software provides an exact electronic orientation of the recorded image in plan view before carrying out the measurements. If the test object is in a skewed position, a signal warns the operator that the bar must be re-inserted in the correct position. The test results are passed on to a further program for statistical evaluation for quality assurance. The complete test protocol with all measured values and the recorded images of plan and side view are saved by the system for documentation.

The system has successfully entered service with customers and has also been adapted to measure the volume of other confectionery and is now being used for meat products too.



Chocolate bar inspection



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VISION AWARD

Once again UKIVA will announce this year's winner of the UKIVA Award for 'Most Innovative Machine Vision Project' at the PPMA Group Industry Awards at the National Motorcycle Museum on June 4. The award will be presented at a glittering gala dinner in front of 400 industry personnel, and this takes place on the first night of the Total Processing and Packaging Show which is located at the adjacent NEC in Birmingham.

The awards evening will be hosted by radio presenter Paul Ross (brother of Jonathan Ross) and BBC presenter Amy Garcia. Anyone wishing to attend should contact Grant.Collier@ppma.co.uk or call Grant on 020 8773 8111. The event is sponsored by ABB Robotics, FESTO, KUKA, Linx Printing Technologies, Sutton Winson, tna, and Machinery Update Magazine.



Robert Pounder from Olmec-UK receives last year's 'Most Innovative Machine Vision Project' Award

TECHNICAL TIPS

Some useful technical tips from UKIVA members:

Is CXP right for you? (Matrox Vite)

This white paper introduces CoaXPress, compares it to established standards like Camera Link® and GigE Vision®, describes the applications for which it is best suited, and discusses how this standard may evolve.

www.matrox.com/imaging/media/pdf/products/developers_center/is_cxp_right_for_you.pdf

3D Laser Scanning – lasers and machine vision (Alrad Imaging)

The use of lasers as illumination sources in machine vision applications is a standard practice in achieving accurate, simple, and flexible representations of objects under inspection. Of particular use are the structured light laser products. The core principle of use is triangulation and this document explains the principles of triangulation and its translation to industrial use.

www.alrad.co.uk/datasheets/Imaging/3D_Laser_Scanning_-_Lasers_and_Machine_Vision_FINAL_042712-Copy.pdf

Sensor configuration and data rates (Stemmer Imaging)

This technical tip provides an overview of how imaging deals with colour. It is split in to two sections. 'Sensor configurations' looks at three methods of acquiring colour data, while 'data rates' shows how different setups affect data rate, and how to calculate data rates.

www.stemmer-imaging.co.uk/en/technical+tips/5244-Sensor-configurations-and-Data-rates



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