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inspect international

VOLUME 5
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1

www.WileyIndustryNews.com

COVER STORY

An Easy to Use CT Inspection System without Compromise

SPECIAL TOPICS

- inspect award 2022
- Spring Trade Fairs

Partner of VISION AUTOMATICA Control emva VDMA spectronet

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inspect award 2022

inspect
award 2022
winner

1
Category
Vision

WILEY

Do not think twice, submit now!

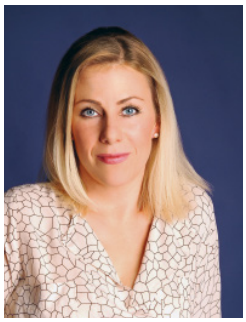
Where? inspect-award.de (German) or inspect-award.com (English)

Until when? May 13, 2022

Who? Every company whose product from the Vision, Automation and Control sector convinces with an innovative approach.

www.inspect-award.com

Trade Fair Season Begins Again!



We are living in challenging times with one disturbing news following the other. This makes it, more than ever, important to hear good news. And I can assure you that there are a lot of good news in this edition of inspect international.

First and foremost, a number of trade shows will finally be held again this year giving us the opportunity to meet in person. There will be the Embedded Vision Summit, Laser World of Photonics, and the EMVA Business Conference, just to name a few. You will find an Interview with EMVA's Managing Director, Thomas Lübkemeier, about networking as a part of the DNA of the conference on page 10.

You will also find a wealth of amazing new products and applications in our articles. This issue's cover story will even take you into a new dimension: With highly functional and exceptionally user-friendly systems, Yxlon opens up a new dimension in industrial CT inspection. Have a look at page 14 to find out more.

We have learnt how important hygiene is in the past years. The same requirements apply to machine vision environments. So, Autovimation fulfills these with their hygienic mounting system for machine vision components that eases cleaning and disinfection. You can find the details on page 26.

> «A number of trade shows will finally be held again this year.»

And, of course, it is time for the inspect award again. Check out page 12 for the registration details and information about our jury. Your product could be a winner!

Let's make this a good year despite all the turbulences. Enjoy springtime, and I hope to see you at one or the other show soon.

Happy reading,

Yours,
Sonja Schleif

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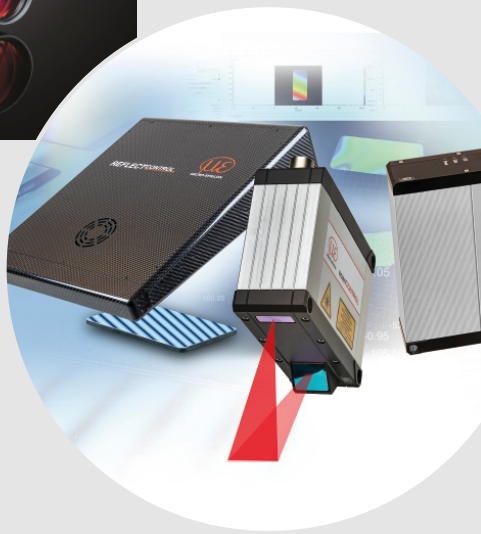

28 Powerful 3D Sensor Generation

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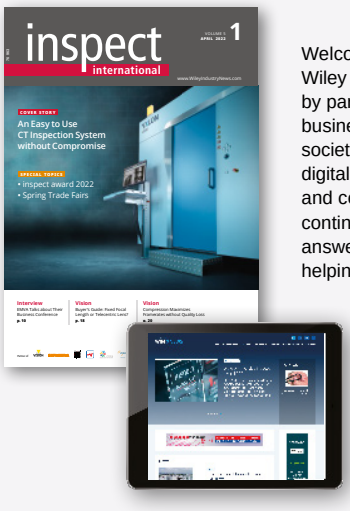
Partner of: VISION, AUTOMATICA, Control, emva, VDMA, spectronet



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www.WileyIndustryNews.com

Basler Reports Strong Annual Results for 2021

Basler presented its annual financial statements for 2021. In a financial year 2021, which was significantly affected by bottlenecks for semiconductor components, the Basler Group was able to achieve sales growth of 26 percent to EUR 214.7 million (previous year: EUR 170.5 million).

Incoming orders grew by 78 percent to EUR 322.5 million (previous year: EUR 181.6 million). The company thus set new records in terms of incoming orders and sales. The pre-tax result rose by 37 percent to EUR 28.0 million (previous year: EUR 20.4 million). The return before taxes was 13.0 percent (previous year: 12.0 percent). With these results, Basler has met the forecast despite a cyber-attack in November and grew faster than the German market for image processing components: The German Machinery and Plant Engineering Association (VDMA) reports an increase in sales of 17 percent for the industry in 2021 and a 28 percent increase in new orders.

Challenges in the procurement of semiconductor components are expected to remain the limiting factor for growth in the 2022 financial year. Furthermore, the war in Ukraine and the associated political unrest are leading to new uncertainties, the effects of which are currently still difficult to foresee, as a company speaker states.

www.baslerweb.com

Image: Basler

The main building of Basler AG in Ahrensburg.

Olympus Spins Out Scientific Solutions Business

Olympus Corporation completed the separation of its scientific solutions business to a wholly owned subsidiary, Evident Corporation. Following the divestiture of its Imaging business, this move further signifies the company's long-term strategy to cement its position as a major player in the medtech industry. The proposed split was first announced in June 2021. As a newly established wholly owned subsidiary, Evident, headquartered in Japan, continues to operate independently under the Olympus umbrella.

Source: Olympus / Evident / Wiley

Olympus' scientific solutions business encompassed the company's industrial and life science businesses. The reorganization will give the scientific solutions business the autonomy and agility to respond quickly and more flexibly to the needs of its customers.

The new company name exemplifies our unwavering commitment to continue providing high-quality products and technical expertise, allowing our customers to discover new insights and find new evidence in their areas of expertise, and a renewed focus on customer collaboration and responsiveness to customer concerns.

www.olympus-global.com

Events

WHEN / WHERE	WHAT / WHO / INFORMATION
April 26–29, 2022 Munich, Germany	**Laser World of Photonics** www.world-of-photonics.com
May 3–6, 2022 Stuttgart, Germany	**Machine Vision Forum at Control 2022** evotron-gmbh.de/de/academy
May 10–11, 2022 London, Great Britain	**Image Sensors Europe 2022** www.image-sensors.com/image-sensors-europe
May 10–12, 2022 Nuremberg, Germany	**Sensor+Test 2022** www.sensor-test.de
May 12–14, 2022 Brussels, Belgium	**EMVA Business Conference 2022** www.business-conference-emva.org
May 30 to June 2, 2022 Hanover, Germany	**Hanover Fair 2022** www.hannovermesse.de

IFM Increases Sales by 21 Percent to EUR 1.16 Billion

Image: IFM

Christoph von Rosenberg is Chief Financial Officer of the IFM Group of companies.

In the past fiscal year, IFM, a specialist in automation technology, was able to increase its previous year's sales by 21 percent and achieve a new sales record of around EUR 1.16 billion. "The fact that we have come through the crisis in such a strong position shows that our growth strategy with a diversified market and industry structure is successful in the long term," said Christoph von Rosenberg, CFO of the IFM Group, on the publication of the business figures: "A stable supply chain despite disrupted supply chains worldwide has also played a significant role in our success. In 96.4 percent of cases, we were thus able to realize a delivery on the customer's desired date in 2021 as well." Earnings (EBIT) of 10.6 percent (previous year 7.6 percent) also increased significantly compared with the previous year and reached a record level.

Personnel development also reflects the growth of the Group. With an increase of a good ten percent, the total workforce at the turn of the year was over 8,100 employees worldwide, of whom just under 5,000 work in Germany. Over 2/3 of all products are manufactured at IFM's five locations on Lake Constance. A large part of the research and development area is also located there. Accordingly, these locations are home to the largest number of employees, around 3,500 - and the need for qualified personnel remains high.

www.ifm.com

Image: Automation Technology

The new management team (from left), consisting of Managing Director Daniel Seiler and Technical Managing Director André Kasper, as well as founder Michael Wandelt

Automation Technology Gets New Managing Director

The co-founder of camera manufacturer Automation Technology, Michael Wandelt, handed over his duties as CEO to Daniel Seiler, the former CEO of IDS. Among other things, he plans to expand the US business.

Seiler, 43, will lead the company as CEO together with CTO and founder Dr. André Kasper. He thus takes over the operational responsibilities of the previous CEO and founder Michael Wandelt.

Seiler studied electrical engineering in Darmstadt, specializing in communications engineering, and later completed an Executive MBA in Frankfurt while working. He has been working in the machine vision industry for many years: starting as applications engineer at IDS Imaging Development Systems in Obersulm in 2005, Seiler led the US site in Boston to success within four years at the same company.

He then returned to the company's headquarters to take over as CEO. This was followed by two years as CEO at the laser technology startup Cycle, during which he already supported AT as a member of the advisory board.

www.automationtechnology.de

Image: Jenoptik

Jenoptik Executive Board 2022: CEO Dr. Stefan Traeger (left), CFO Hans-Dieter Schumacher.

Jenoptik with a Sales Increase of 22 Percent

Jenoptik achieved sales of around EUR 750 million in the continued operations in 2021, an increase of 22 percent (previous year EUR 615.5 million). Sales increased particularly in the Asia/Pacific region with an increase of 64.8 percent. Europe (excluding Germany) recorded a sales increase of 11.1 percent, America increased by 28.0 percent. A total of 81.4 percent of sales were generated abroad after 76.9 percent in the 2020 financial year.

The profitability of the continued operations was significantly increased thanks to the increase in sales but also due to positive one-off effects of EUR 30.5 million in connection with the acquisitions of Trioptics and Interob and positive effects resulting from the restructuring measures taken in 2020. EBITDA improved by 67.9 percent from EUR 92.8 million to EUR 155.7 million (including PPA effects of minus 2.1 million euros (prior year minus EUR 4.6 million)). The previous year's result was burdened by costs from structural and portfolio measures of EUR 19.1 million . In 2021, EBITDA without the one-off effects reached EUR 125.2 million.

www.jenoptik.de


Image: Leica Microsystems

Dr Annette Rinck

Annette Rinck Appointed President of Leica Microsystems

Leica Microsystems has announced the appointment of Dr Annette Rinck as its president, with effect from 1 April 2022. Annette succeeds Markus Lusser, who was promoted to a new life sciences position within Danaher Corporation, Leica's parent company.

She joins Leica from Honeywell where she has spent the past seven years, most recently as general manager of global brands and companies within the building management systems division. Previously Annette worked at Eaton, Caterpillar, and BMW.

www.leica-microsystems.com

Stemmer Imaging Confirms Record Business Figures for 2021

Stemmer Imaging has published its final figures for the 2021 financial year: Incoming orders increased to 162.1 million euros, 42.4 percent more than in the same period of the previous year and 35.8 percent more than in the same period of 2019.

Sales increased by 26.1 percent to 130.1 million euros and were thus significantly higher than in the same period of the previous year and at 9.7 percent also significantly above the pre-crisis level of 118.6 million euros in 2019.

www.stemmer-imaging.com

Zebra Technologies to Acquire Matrox Imaging for 875 Million U.S. Dollars

Zebra Technologies wants to take over Matrox Imaging. This underlines the US company's claim to gain further market share in industrial machine vision.

Zebra expects to fund the 875 million US dollars (approximately 797 million euros) purchase price through a combination of cash on hand and fully committed financing under its credit facility. The transaction is subject to customary closing conditions, and is expected to close in 2022. Matrox Imaging generates approximately 100 million US dollars in annual revenue and has a higher profit margin profile than Zebra.

Last year, Zebra acquired Adaptive Vision and Fetch Robotics, already expanding its portfolio of fixed industrial scanners and vision systems. Matrox Imaging now adds expertise and products in software, machine learning and deep learning. Matrox Imaging Division headquarters will remain in Montreal.

www.zebra.com

Laser World of Photonics with Quantum Technology

Preview of the Trade Fair for Photonics Components and Systems

The Laser World of Photonics trade fair will take place from April 26 to 29 at the Munich exhibition center. For the first time, the future topic of quantum technology will have its own stage with the parallel event "World of Quantum".

While Laser World of Photonics 2021 could not take place due to the corona pandemic – at least the accompanying scientific congress existed in digital form – this year, there will be the on-site exhibition plus the additional quantum technology event World of Quantum.

Almost 50 Percent of Participants Come from Abroad

Companies from 30 countries had registered by mid-January for Laser World of Photonics, which will focus on laser systems for industrial manufacturing as well as optoelectronics and testing technology. The USA and China are particularly well represented. This means that almost half of all exhibitors filling five halls at the Munich exhibition center come from abroad. Market leaders from the photonics sector and industry-related research institutes have also confirmed their participation, including Trumpf Laser- und Systemtechnik, Coherent Shared Services, IPG Laser, Laser Components Germany, Fraunhofer-Gesellschaft, Laser 2000, Newport Spectra-Physics, Berlin Partner für Wirtschaft und Technologie, and Jenoptik Optical Systems.

Parallel Event: World of Quantum in its Own Hall

This year sees the premiere of the World of Quantum with its own hall, which will focus on what is currently probably the most exciting future field of photonics: quantum technology. This exhibition area is intended to link research, industry and users of this field and enable them to discuss the appropriate implementation of current research results in systems and to present initial examples of applications of this future technology in computing and cryptography, sensor technology and imaging, communication, and medicine. ■

Key Facts

Laser World of Photonics 2022

Date: April 26 to 29

Venue: Munich Trade Fair Center

Opening hours: 9 a.m. to 5 p.m. (Friday until 4 p.m.)

www.world-of-photonics.com

Image: Messe München

Around 50 exhibitors will showcase their new developments and over 100 application examples at the accompanying trade exhibition.

Embedded Vision Summit with over 100 Presentations

Preview of the Embedded Vision Conference

Since 2012, the Embedded Vision Summit has been the leading conference and trade fair for practical computer vision and AI applications in machine vision. This year's conference, which will again be held in person in Santa Clara, California, boasts 55 exhibitors and 100 presenters. More than 1,000 machine vision experts are expected to attend.

The Embedded Vision Summit will take place May 16-19 in Santa Clara, California. More than 100 presentations on embedded vision and deep learning technologies and tools will be offered. In addition to product and technology presentations, case studies and exciting panel discussions will liven up the program. Moreover, 55 exhibitors will present their new developments as well as more than 100 application examples at the accompanying trade exhibition, which will cover all the technical and business aspects of computer vision, deep learning, AI and related technologies.

The Embedded Vision Summit is organized by the Edge AI and Vision Alliance. They expect just over 1,000 product and application developers, business leaders, and users, all focused on artificial intelligence at the edge.

Workshops on AI in the Edge

New in 2022 is the Edge AI Deep Dive Day, a series of workshops focused on specific topics in AI in the edge domain.

The keynote speaker for the Embedded Vision Summit 2022 will be Dr. Ryad Benosman, a leading leading expert in the field of neuromorphic sensing and computing. Benosman is a professor at the University of Pittsburgh and an associate professor at the CMU Robotics Institute. In his keynote "Event-based Neuromorphic Perception and Computation: The Future of Sensing and AI", he will explain the fundamentals of bio-inspired, event-based image sensing and processing approaches, explore their strengths and weaknesses, and show that bio-inspired image processing systems have the potential to significantly outperform traditional visual AI approaches. ■

Key Facts

Embedded Vision Summit

Date: May 16-19, 2022

Venue: Santa Clara Convention Center, Santa Clara, California

www.embeddedvisionsummit.com

Images: Edge AI and Vision Alliance

The vision tech community can at last meet again in Europe at the EMVA Business Conference as shown here during the last physical conference 2019 in Copenhagen.

"Finally, the Vision Industry in Europe Can Come Together Again at the EMVA Business Conference"

Interview with Thomas Lübkemeier, Managing Director of the EMVA

The 20th EMVA Business Conference kicks off in Brussels on May 12. At the top of the agenda is networking within the European machine vision industry. No less exciting, however, are the presentations on the economic situation and, for the first time, on cyber security, but also artificial intelligence, hyperspectral imaging or Industry 4.0. And one thing Thomas Lübkemeier, Managing Director of the EMVA, makes clear in the interview: if the Belgian authorities do not expressly forbid it, the conference will definitely take place.

inspect: The EMVA Business Conference has now had to be cancelled twice due to the Corona pandemic, but now it can finally take place – albeit in Brussels instead of Sofia. What will the participants be offered?

Thomas Lübkemeier: The conference location in Brussels is not a disadvantage – on the contrary: we are in the heart of Europe, many participants travel by train or even by car and the pandemic situation can be easily assessed. Brussels as the European "capital" offers the optimal infrastructure for hosting an international conference. In addition, Belgium has a vibrant vision tech scene, as we will also learn during the conference. These are ideal conditions for the vision industry in Europe to finally come together again in person at the EMVA Business Conference.

inspect: What will be the main topics of the conference?

Lübkemeier: As usual at the Business Conference, the lecture program will offer a mix of current technical vision topics and lectures that go beyond the industry's usual horizons. Traditionally, the opening keynote deals with the current economic situation, which will be expanded by this year's speaker to include a geopolitical component. For the first time, the important topic of cybercrime/cybersecurity will be a focal point with two contributions. Artificial intelligence, platform development of lenses, progress in image sensors, especially in the non-visible spectrum, machine vision in Industry 4.0 are further technical topics, as well as a presentation of the exciting machine vision activities in the host country Belgium.

inspect: The pandemic is not over yet. What safety measures do participants need to be prepared for?

All images: EMVA

Networking is a central element of the EMVA Business Conference DNA.«

Thomas Lübkemeier,
Managing Director of the EMVA

Lübkemeier: These are essentially measures that we have all already become accustomed to. The rules on wearing mouth-to-nose protection are continuously being adapted, currently mandatory in Belgium on public transport and in the health sector. During the conference and certainly at the seat, the mask can be removed as things stand.

inspect: How do the conference hotel's premises support these efforts?
Lübkemeier: We very consciously chose a hotel in which all rooms have windows that can be opened for ventilation. A terrace area and a walk-in courtyard invite guests to linger, and the hotel's own underground parking garage makes it easy to reach the hotel by car.

inspect: What networking opportunities does the Business Conference offer?

Key Facts

EMVA Business Conference

Date: May 12 to 14, 2022

Venue: Steigenberger Wiltcher's, Brussels, Belgium

www.business-conference-emva.org

Lübkemeier: Networking is a central element of the EMVA Business Conference DNA and is actively supported by the online registration platform. After registering, all conference participants can arrange individual B2B meetings with each other in advance, which then take place at specially provided tables during the conference breaks. This makes access to interesting discussion partners plannable and no longer dependent on coincidence. In addition, the social part of the conference, i.e. the get-together on Thursday and the evening event on Friday, also offers plenty of scope for mutual exchange.

inspect: What do you think the chances are that the conference will be canceled again because of Corona?
Lübkemeier: There are no signs of that at the moment. Of course, we are in constant contact with the hotel as the venue. As long as the green light comes from there and thus indirectly also from the Belgian authorities, the EMVA Business Conference 2022 will take place. ■

AUTHOR
David Löh
Editor in chief of inspect

inspect award 2022: Submit Your Product Now!

Machine Vision Innovation Award

The application phase for the inspect award 2022 has begun. All machine vision and optical metrology companies are invited to submit their products by May 13. This year, the six winners of the two categories will receive a trophy in a completely new design.

inspect award 2022

At www.inspect-award.com, machine vision and optical metrology companies can submit their most innovative products free of charge to apply for the prestigious inspect award 2022. A jury of five experts will select the ten most innovative products in each of the categories "Vision" and "Automation + Control" from all the applications. The readers of inspect and all visitors of wileyindustrynews.com are then called upon to vote for the winners.

The total of six winners in the "Vision" and "Automation + Control" categories will then be awarded at the Vision trade fair in Stuttgart at the beginning of October.

20 Nominated Products are Presented in Detail in the June Issue

In the June issue of inspect (to be published on June 13) and on www.wileyindustrynews.com, the nominated products will be presented to the public in a prominent position. In the November issue, all winning products will be honored in detail. In addition, all winning companies will receive the right to use the coveted inspect award winner logo free of charge. So, it pays to take part. ■

Application deadline: May 13, 2022

The application phase for the inspect award 2022 runs until May 13, 2022.

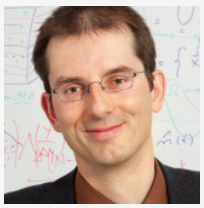
Apply now at www.inspect- award.com!

If you have any questions, David Löh, Editor-in-Chief of inspect, will be glad to answer them at david.loeh@wiley.com.

A Brief Introduction: The Jury

Anne Wendel
Since 2014, Anne Wendel has been responsible for the Machine Vision department at VDMA with around 120 member companies from Europe. Her work focuses on networking events, statistical analyses, standardization, press and public relations, and trade fair policy. In the latter function, she supports the further development of Vision and Automatica, for which the VDMA is the technical and conceptual sponsor.

Thomas Lübkemeier
Since 2013, Thomas Lübkemeier has led the Barcelona-based European Machine Vision Association (EMVA) as secretary general. He is an engineer in electrical/automation engineering and, among other things, was stationed abroad for several years for German companies and, after his return to Germany, was responsible as managing director for various foreign subsidiaries.



Prof. Dr.-Ing. Michael Heizmann
Even after his doctorate at the University of Karlsruhe in 2004 on a topic of image processing for forensic technology, Prof. Dr.-Ing. Michael Heizmann remained faithful to image processing for many years. Since 2016, he has been Professor of Mechatronic Measurement Systems at the Institute of Industrial Information Technology IIIT at the Karlsruhe Institute of Technology (KIT) and also Institute Director (collegial institute management) of IIIT. He is an expert in theoretical image and signal processing as well as in surface metrology and inspection. Since 2006, he has headed the technical committee 8.12 "Machine Vision in Measurement and Automation Technology" of the VDI/VDE- Gesellschaft für Mess- und Automatisierungstechnik (GMA), which publishes the VDI/VDE/VDMA guideline series 2632 "Machine Vision".

Paul-Gerald Dittrich
Paul-Gerald Dittrich holds an M. Eng. in electrical engineering/system design. He is a research associate in the field of spectral imaging at the Ilmenau University of Technology in the Faculty of Mechanical Engineering in the department of quality assurance and industrial image processing. He also works at Spectronet as a project manager to improve project-specific collaboration between companies and research institutions that develop or apply image processing and photonics for quality assurance.

David Löh
After his journalistic beginnings at daily newspapers during and after his studies, David Löh took a liking to the world of trade magazines. He started out in the automation industry, which he left in favor of an exciting assignment at a plastics trade magazine. After another stint in a responsible position, he returned to automation industry at the end of 2019 to take over as editor-in-chief of inspect.

A New Dimension in Industrial CT Inspection

While Versatility and Ruggedness Are Desirable, Ease of Use Is Key for Advanced CT Systems

The development of Yxlon's new CT systems UX20 and UX50 combined both state-of-the-art technology and the results of their open ears for customer requirements. As a result, the system is not only highly functional but also exceptionally user-friendly.

The demand for industrial X-ray computed tomography is constantly growing. The range of applications is enormous: CT is used in the research and development of new products, materials, and manufacturing methods, as well as in natural sciences and industrial production, and more. And every day, due to rapid advancements in technology, new fields of application are opening up. No other technology than CT can create three-dimensional virtual twins of a part that can be inspected, analyzed, and even measured in detail at any point in its interior. But it doesn't always make sense to choose a high-specific CT system. Where part diversity, fast inspection with changing requirements, high availability, and high performance are concerned, that's where you want an all-rounder that meets as many of your needs as possible. It should be robust and durable and not capitulate to harsh environments or continuous

> A user should not have to spend a long time learning about physical principles and special knowledge in X-ray technology.«

use. And if it even can get upgraded to meet the challenges of tomorrow, this solution is a future-proof investment.

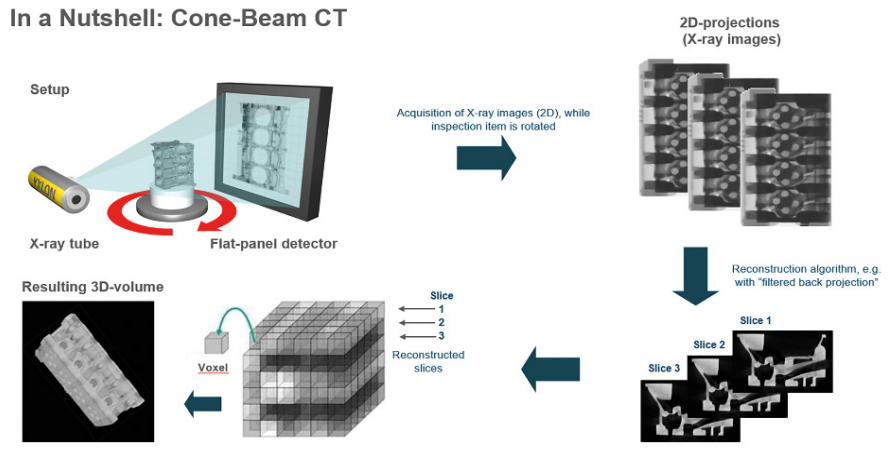
A New Level of User-Friendliness

"At the same time, a modern inspection system should be easy to operate. A user should not have to spend a long time learning about physical principles and special knowledge in X-ray technology to achieve good inspection results," says Peter Kramm, Senior Product Manager at Yxlon. "We listened carefully to our customers: compact, fast systems that are exceptionally easy to use via our Geminy software platform and always deliver great results. Various presets and automations, such as the automatic sequences for detector calibration and image sharpness measurement following ASTM E1695, make the user's daily work much easier. With UX20, the creation of test sequences is just as easy as the testing itself supported by graphical icons, wizards, and clear menu navigation. Meanwhile, the Yxlon Healthmonitor integrated into Geminy has become indispensable for the operators. It uses a traffic-light system to indicate the current status of the system, e.g., the color changes from green to yellow when no calibration data is available for geometry correction or detector calibration. The ASTM E1695 test reports can also get conveniently accessed via the Healthmonitor."

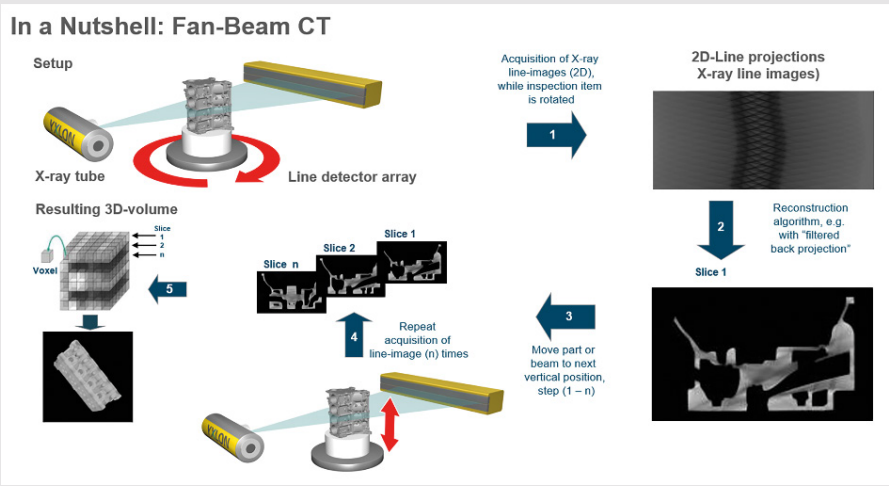
Going Larger

Yxlon UX50, with its high power of 450 kV and a generous inspection envelope, is particularly suitable for large and dense parts weighing up to 100 kg. It enables the precise analysis of traditional drive technology parts, such as engine blocks and cylinder heads, as well as e-mobility components, such as cast rotors with their complex internal structures. The use of a flat-panel or line detector depends on the inspection task. Therefore, UX50 offers three configurations: equipped with a flat-panel detector, line detector, or in the full version, both flat-panel and line detector. Regardless of which the customer chooses to invest in based on their current

Cone-Beam CT with Flat-Panel Detector vs. Fan-Beam CT with Line Detector

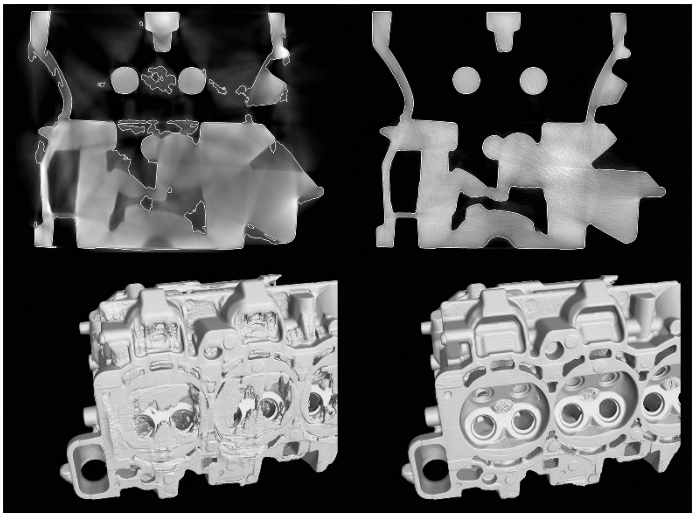


In basic principle, cone-beam CT acquires hundreds of X-ray images from all angles within one complete rotation of the test part, which subsequently get reconstructed via software to a 3D volume.



Fan-beam CT is the ultimate for inspecting very large and dense test parts. Here, the test part is scanned pixel layer by pixel layer from all angles. The individual layers get reconstructed via software to a 3D volume. This scanning technique is more time-consuming but virtually free of artifacts.

The seamless combination of both methods allows for detailed and fast results even for challenging parts. Starting with a cone-beam CT and the creation of the 3D volume, fan-beam CT is applied for defined ROIs (regions of interest) and provides the optimal data for their in-depth analyses.



Example for Image Optimization via Software Tools: ScatterFix
• Cone-beam CT without (left) and with (right) ScatterFix

Configuration with flat-panel and line detector

requirements, they can easily upgrade the system to the full version later when the need should arise.

When using the flat-panel detector, Yxlon UX50 masters all possible techniques such as circular-path and helical CT in the QuickScan mode with a continuous rotation of the test part or the QualityScan rotating the part step by step. Filters and image enhancement tools are also available: There are various methods for beam hardening correction to adjust undesirable gray-value gradients in otherwise homogeneous materials, which is necessary for a reliable pore analysis. Metal artifacts occur in particular in complex components consisting of plastics and metals. With the help of MAR (metal artifact reduction), these unwelcome effects causing the less dense material to partially 'disappear' get significantly reduced. ScatterFix 2.0 is the latest version of Yxlon's ScatterFix functionality for large, massive, and highly scattering components. ScatterFix reduces interfering scattered radiation during or after the scan, thereby improving the quality of CT data, for example, to optimize surface determination.

In addition, various field-of-view extensions both vertically and horizontally maximize the possible part spectrum. Even with Yxlon's line detector CTScan 3, UX50 offers a horizontal field-of-view extension unique in the market as an Yxlon patent. And with the appropriate image optimization tools, you always get the best results and high-quality CT data for reliable material analyses.

Making the Right Choice

When deciding on a detector configuration and perhaps even considering the equipment with both detector types, you should consider the range of components and materials you need to inspect and the appropriate inspection method in each case. Cone-beam CT with a flat-panel detector and fan-beam CT with a line detector both have their advantages and disadvantages for the different test parts. Particularly dense materials require fan-beam CT, but this is much more time-consuming than cone-beam CT. With the full configuration of both detectors, the user is prepared for every test part and can switch them by mouse click within a test sequence, including the automatic transfer of the calibration data. Switching between CT and DR (digital radioscopy/fluoroscopy) within an inspection sequence is just as easy. When it comes to the pure detection of defects, one usually first obtains an overview with digital radioscopy and switches to CT where more details are required, analyses of, e.g., porosity or measurement tasks must get performed. Due to the possible manipulation of the test part using joysticks and the lateral movement of the flat-panel detector, via joysticks too, rapid fluoroscopic examinations are also possible in the UX50. DR is supported by numerous digital 2D live image filters, automatic 2D inspection reports, the possibility of using predefined 2D inspection sequences, and even documenting inspection decisions at the touch of a button on the control unit. HDR-Inspect (High-Dynamic Radioscopy) ensures outstanding detail recognition even in the DR image.

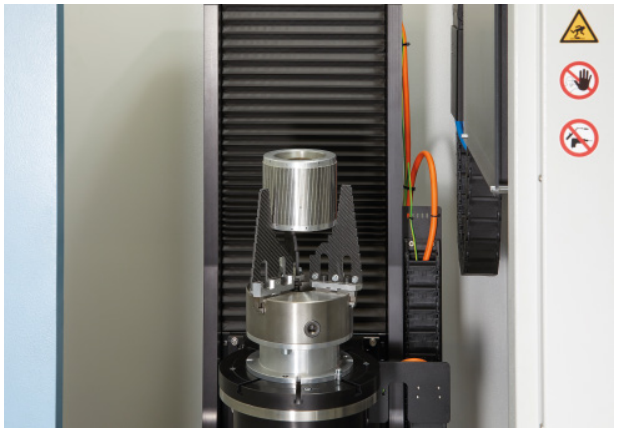
Typical Test Parts for UX50

- Components made of aluminum, steel, and superalloys,
- Mechatronic assembliesm,
- Electromobility drive components and batteriesm,
- Geological samples,
- Fossils for paleontological research.

All images: Yxlon International

System Set-up and Movement Axes

1 X-ray warning lamp in LED technology
2 Temperature-stabilized, high-efficiency Yxlon line detector CT Scan3 with tungsten collimator and brass housing
3 Motorized switching between line detector and flat-panel detector application with just one mouse click and automatic transfer of detector and geometry calibration data
4 Large flat-panel detector, which can be motorized horizontally moved for a CT scan with field-of-view extension or a 2D fluoroscopic inspection
5 Powerful 450 kV mini-focus tube with variable collimators to reduce scatter radiation
6 Turntable attachment, suitable for fixing specific part holders and Yxlon calibration specimens
7 Fast, motor-driven vertical movement of the test part
8 Air-conditioned, dust-protected control cabinet
9 Pushbutton for safe positioning with door open and reduced speed
10 Fast motorized cabinet door
11 Manual axis for setting the geometric magnification in three positions
12 Height-adjustable control panel for comfortable working in a sitting or standing position
13 Intuitive Geminy user interface for easy operation



Supporting traditional drive technology as well as e-mobility

Comprehensive Accessories

However, the technical features and capabilities of the system were not the only considerations during development. And user-friendliness is not limited to simple operation via intuitive software but also includes ergonomics. As with the UX20, the control panel is attached directly to the system and is height-adjustable for ergonomic working. It is clearly arranged and can be precisely operated using pushbuttons and joysticks, even when wearing gloves. A desk extension is available for working with a mouse, which can be mounted on the left or right side of the table as desired. The pushbuttons on the outer wall of the booth in the door area also offer further convenience. Here, the exact manipulation of the test part is made possible on sight with the door open. An optional loading crane is available for test parts of very great weight. Extensive accessories and extras such as the carbon part holder and the 60 cm turntable for exceedingly large samples can greatly simplify everyday work. And the separate CT evaluation station is available in various performance classes and can be set up where the inspector can work best. The high-performance computer is protected in a closed rack, either furnished with a fan or air conditioning. ■

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Fixed Focal Length or Telecentric Lens?

The Perspective Decides Concept and Advantages of Telecentric Lenses

In optical metrology applications, telecentric lenses – in contrast to fixed focal length lenses – have the advantage that they provide correct measurement results even when the distance to the object varies.

How do telecentric lenses work? And how exactly do they differ from fixed focal length lenses? This article introduces the peculiarities and explains why telecentric models are predominantly used in optical metrology.

Similar to human vision, fixed focal length lenses (also referred to as entocentric lenses) have an angular field of view, resulting in objects further away being imaged smaller and vice versa. In a metrology setup, this property is undesirable because the measurement result, e.g. the diameter of a component, is not meant to change even if the test specimen is not positioned exactly but only within a certain tolerance range in front of the test system. In optical terminology, this phenomenon is referred to as parallax or perspective error, meaning the change in magnification depending on the working distance. In telecentric lenses, this undesirable property is eliminated or greatly reduced by their design. Figure 1 shows two identical objects at different distances from the respective measurement setup. The left image shows the scene taken with a fixed focal length lens, for the right image a telecentric lens was used. Despite the significantly different distance of the two cubes from the lens, they are shown the same size in the right image. This visualization is achieved by ensuring that the chief ray runs parallel to the optical axis in the design of the lens. This is the defining characteristic of an object space telecentric lens. However, this also means that at least the first lens element must be at least as large in diameter as the workpiece itself to be inspected.

Depth of Field

It is often mistakenly assumed that telecentric lenses have a greater depth of field than fixed focal length lenses. Ultimately, however, the depth of field is determined by the f-number of a lens; telecentricity only has an indirect impact. The f/# is, among other things, decisive for the diameter of the lens. This diameter is anyway large with telecentric optics compared to a fixed focal length lens, all other parameters being equal. Therefore, it is common for telecentric lenses to start only at f-numbers of about f/6. This is to reduce the diameter, design complexity, but also the cost of a telecentric lens. Fixed focal length lenses can often be opened up to f/1.4 – which is unattainable for telecentric lenses.

It should also be noted that when comparing the f-numbers of telecentric and entocentric lenses, it is easy to confuse two different parameters. For fixed focal length lenses, the value usually engraved on the lenses denotes the image space f-number for infinite working distance. The choice of this working distance makes sense for several reasons, a quite pragmatic one being that fixed focal length lenses can be used over a large range of working distances and there is no other "universal" working distance that is applicable to all lenses regardless of focal length or manufacturer. For telecentric optics, however, this choice does not make sense; after all, the working distance is finite and fixed for these lenses. Accordingly, in order to ensure comparability, a parameter known as working f-number is used. It is calculated by weighting the theoretical f-number based on infinity with a factor that depends on the specific magnification of the respective lens. For a correct comparison with the f-number of a fixed focal length lens, the value engraved on this lens must be converted by the same factor.

There is another interesting property of telecentric lenses that can give them advantages over entocentric optics in some applications. Due to the lack of perspective, objects become uniformly blurred when you reach or go beyond the limits of depth of field.

If you look at a round object with telecentric optics and leave the focus area, the object will become symmetrically blurred. An algorithm can therefore still determine the correct position of the center of mass. With fixed focal length lenses, the object would be distorted asymmetrically into an ellipse depending on its position in the image, and it would not be possible to determine its exact position. In this respect, it is possible to extend the nominal depth of field in special situations without necessarily having to accept losses in the quality of measurement results. Depending on the application and algorithm, it may even be advantageous to work with a certain amount of blurring. If the transition of an edge is distributed over several pixels instead of only two in the extreme case,

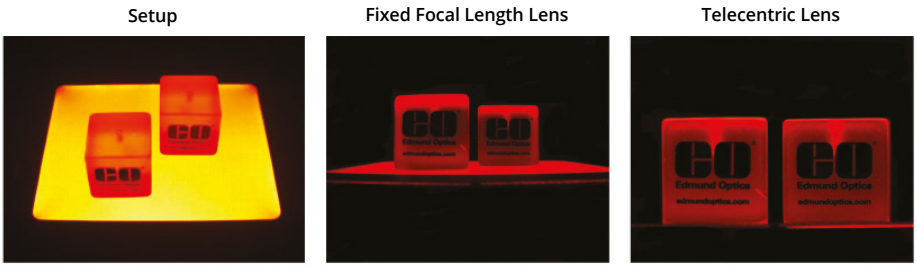

Fig. 1: Middle image: Due to the aperture angle of the fixed focal length lens, the right cube is imaged smaller than the cube of the same size that is closer to the inspection system. Right image: The same scene taken with a telecentric lens. Now both cubes are the same size.

a measurement system may provide more repeatable results.

Telecentricity – Quantitatively

How is telecentricity quantified? In the data sheets, telecentricity is often specified as an angle, usually together with a wavelength. This angle describes the residual angle of the object space chief ray. Since the ideal target is 0°, these are usually very small angles, say in the range of < 0.1°. An exact 0° angle is usually never achieved, because the angle ultimately depends on the wavelength of the light and most lenses are designed for an entire range of wavelengths, not just a single wavelength. It is therefore necessary to find the best possible compromise between the residual angle and the desired wavelength range at which the lens is to be used. Figure 2 shows an example of data of a telecentric 1X lens where the angle of the chief ray relative to the optical axis is shown for three different wavelengths. The y-axis demonstrates the position of the chief ray on the sensor. By definition, the angle at the center of the image is 0° – here is where the chief ray coincides with the optical axis. When moving from here towards the image corner, the chief ray angle is in most cases described by a monotonic function – i.e. the further away from the image center, the larger the angle. In the example, the angle at 5.5 mm (corresponding to a sensor with 11 mm diagonal, 2/3" format) reaches a value of ~0.1° for blue light of wavelength 486 nm. However, the function does not always have to be monotonic and may differ, especially for other wavelengths. For red light (656 nm), the angle at 5.5 mm is only about 0.015°, and the curve even shows a sign change. At approximately 4.4 mm image height, the angle is 0° again. As a rule, it is therefore advisable to use a graph of this type instead of referring to a single value in a spec sheet, which may not be representative of the parameters relevant to the application. Furthermore, it is recommended to recalibrate an optical measuring system when working monochromatically and changing the wavelength of the light.

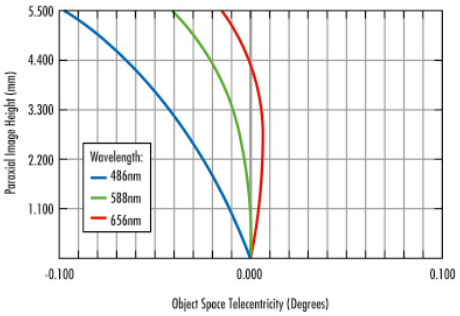

Fig. 2: Typical course of telecentricity (residual angle of the chief ray in degrees) vs. image height, using a 1X lens as an example.

All images: Edmund Optics

Summary

This article presents the applicational advantages as well as the functionality of object space telecentric lenses. Finally, it should be noted that image space telecentric lenses can also offer benefits. These are less sensitive to the exact position and location of the sensor in the camera. Furthermore, the radiometric effect described in the $\cos^4$ law is avoided: the intensity of the light will decrease from the center away to the image edge with the factor $\cos^4$(CRA), where CRA stands for the image space chief ray angle. For a telecentric lens, this angle is 0°, so the factor is 1. Provided that the lens does not have mechanical vignetting in conjunction with the sensor used, no apparent drop in relative illumination will therefore be observed. A final advantage of image space telecentrics kicks in when using precise optical filters installed between the lens and the camera. These filters are usually designed for an angle of incidence of 0°. The more one deviates from this angle, the more the filter response shifts to shorter wavelengths. The filter transmission would thus not be uniform over the sensor area, which is usually not acceptable for precise measurements in e.g. fluorescence or hyperspectral imaging.

In the field of optical metrology, the factor of the lower sensitivity to the exact sensor position is usually the most important. However, in order to achieve the best possible measurement results, it is recommended to use bi-telecentric lenses, which combine the advantages of both concepts. ■

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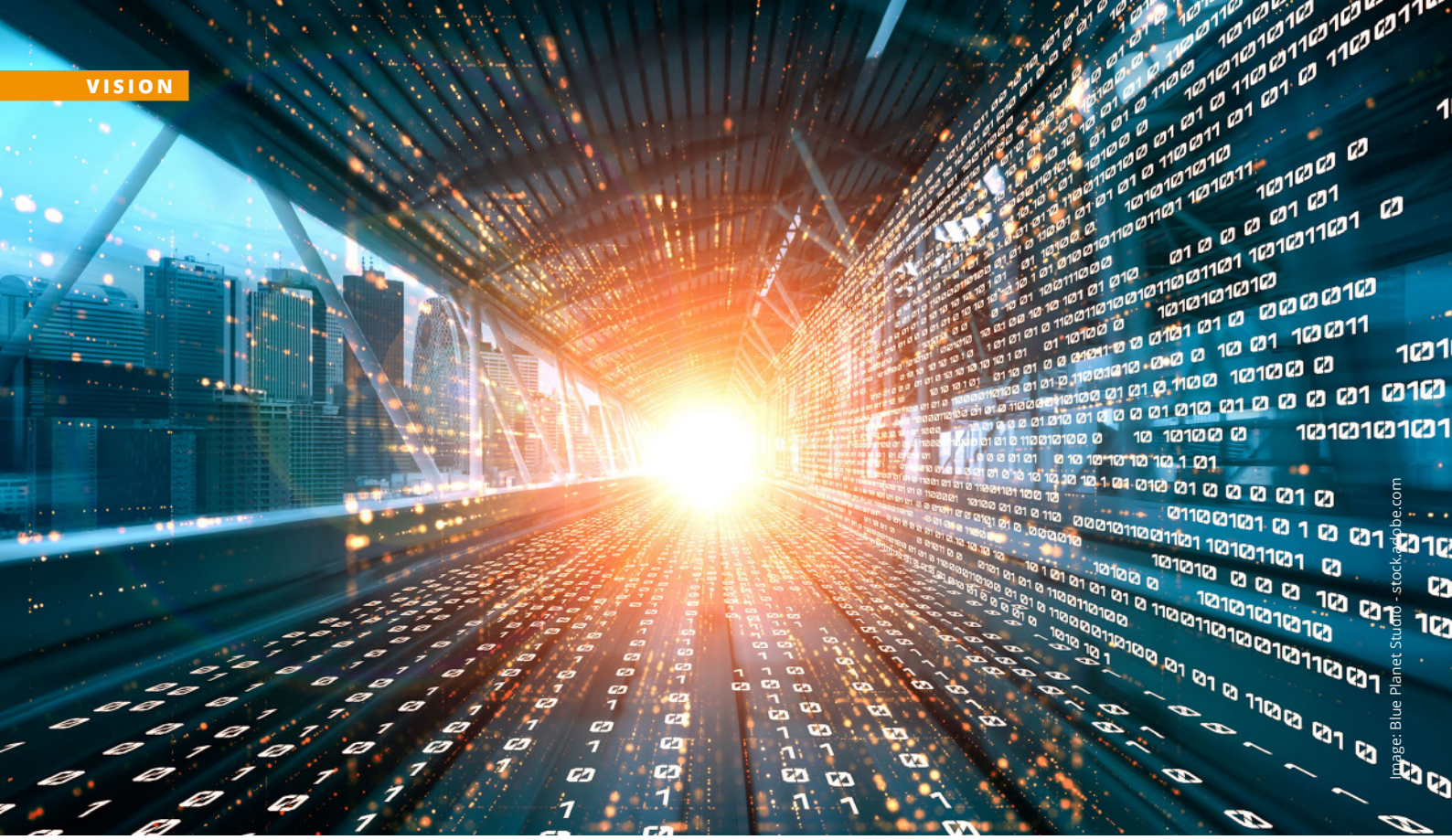


Image: Blue Planet Studio - stock.adobe.com

Lossless Compression

Maximizing Framerates and Surpassing GigE Bandwidth Limitations

When getting the most amount of detail from a moving target is critical, system developers are constantly looking for ways to increase framerates without compromising on image quality, ideally at minimal or no extra cost.

Teledyne Flir's lossless compression feature delivers up to 70 percent higher maximum frame rates. Thanks to the reduced image size, the overall throughput of the camera is reduced, allowing an increased maximum framerate for GigE cameras that go beyond the standard GigE Interface bandwidth limitation of ~120 MB/s.

In addition, the feature increases the number of cameras on a single bus. With lower overall data transmission over the link, users can fit more cameras on a single bus, without reducing the image quality or framerate of the other camera(s) on the same bus/connection, eliminating the need for an additional host adapter, reducing cost.

Moreover, it minimizes disk space usage; it's now possible to save images in the compressed format, reducing the disk usage on the host system, and decreasing the amount of time necessary to write images to disk. Of course, the lossless compression feature maintains 100 percent image data and avoids packet loss. The feature is free of charge and does not impose additional costs.

How It Works

Lossless Compression is a feature available on select Teledyne Flir GigE machine vision cameras that use their proprietary algorithms to compress image data. The compression occurs on camera before transmitting data to the host; thereby enabling the cameras to transmit data at higher maximum frame rates, utilizing lower bandwidth for data transmission while maintaining 100 percent image data. Once the data is transmitted to the host, it can be uncompressed or saved in its smaller, compressed form for lower disc space utilization.

Example Use Case with Multiple GigE Cameras

To demonstrate the value of lossless compression, let's take an example use case of a conveyor-based system requiring three 5MP cameras placed along the line at different points. Two of those cameras need to

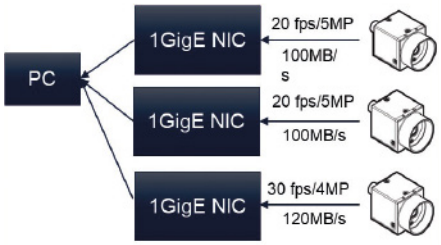
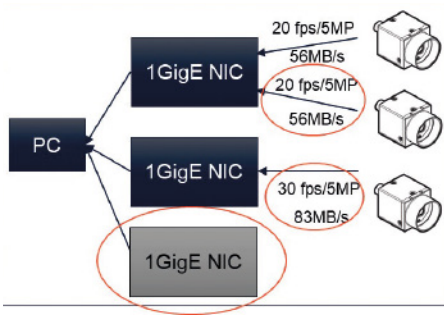


Fig. 1: Three standard BFS-PGE-50S5C cameras connected to a host PC



Images: Flir Systems

Fig. 2: With Lossless Compression; the "greyed out" GigE NIC is no longer required.

> Enabling lossless compression helps to increase the maximum framerate of the camera (up to sensor speed), without reducing the resolution of the camera.«

run at 20 fps and a third one at 30 fps for the system to deliver accurate output. Furthermore, the industrial environment and required cable length necessitate the use of gigabit ethernet in this case.

Such a system would typically be setup as illustrated in Figure 1. The host PC would be connected to three Gigabit NIC's (Network Interface Cards), one for each BFS-PGE-50S5 camera. Due to bandwidth limitations of Gigabit interface, the cameras won't be able to share network interface cards (i.e. each camera's data transmission requirement would be close to the bandwidth limit of one NIC). The third camera, due to its higher framerate requirement, would have to compromise on resolution too, just to stay within available bandwidths on a 1GigE NIC. Besides being a more expensive setup with 3 GigE NICs, the vision system designer is still having to compromise on image detail on the third camera – a less than ideal outcome for this application. With lossless compression enabled (assuming a compression ratio of 1 to 1.8), the same system can now run the first two cameras on a single interface card, eliminating an entire NIC from the previous setup – saving space, reducing a failure point, and lowering design costs. The third camera would also be able to achieve the required 30 FPS at full 5 MP resolution, while taking up lower bandwidth than the previous setup, saving CPU resources.

To Summarize

Enabling lossless compression helps to increase the maximum framerate of the camera (up to sensor speed), without reducing the resolution of the camera. Additionally, it also enables lower data over the link, translating to fewer peripherals and reduced CPU usage. These unique features reduce system costs, enable higher framerates, lower failure points and maintain 100 percent image data – without incurring any additional costs.

Supported Camera Models

Lossless Compression is available on selected Teledyne Flir GigE machine vision cameras to deliver up to 170 percent increased frame rates, minimizes disk space usage, and thus enable increased number of cameras on a single bus all while preserving 100 percent of the image data. The feature is available on Teledyne Flir's most popular Blackfly S GigE models and will also be made available on all upcoming GigE cameras featuring Sony's Pregius S sensors, on both Blackfly S GigE and Oryx camera families.

Blackfly S GigE Camera

The Blackfly S leverages the industry's most advanced sensors in an ice-cube form factor. It is packed with powerful features enabling the user to easily produce the exact images needed and accelerate the application development. This includes both automatic and precise manual control over image capture and on-camera pre-processing. On-camera features including IEEE1588 clock synchronization and full compatibility with popular third-party software supporting GigE Vision, gives system designers the tools to quickly develop innovative solutions. GigE models featuring lossless compression are also available with higher maximum frame rates and lower bandwidth requirements, helping maximize output without compromising image quality. The Blackfly S is available in GigE, USB3, cased, and board-level versions. ■

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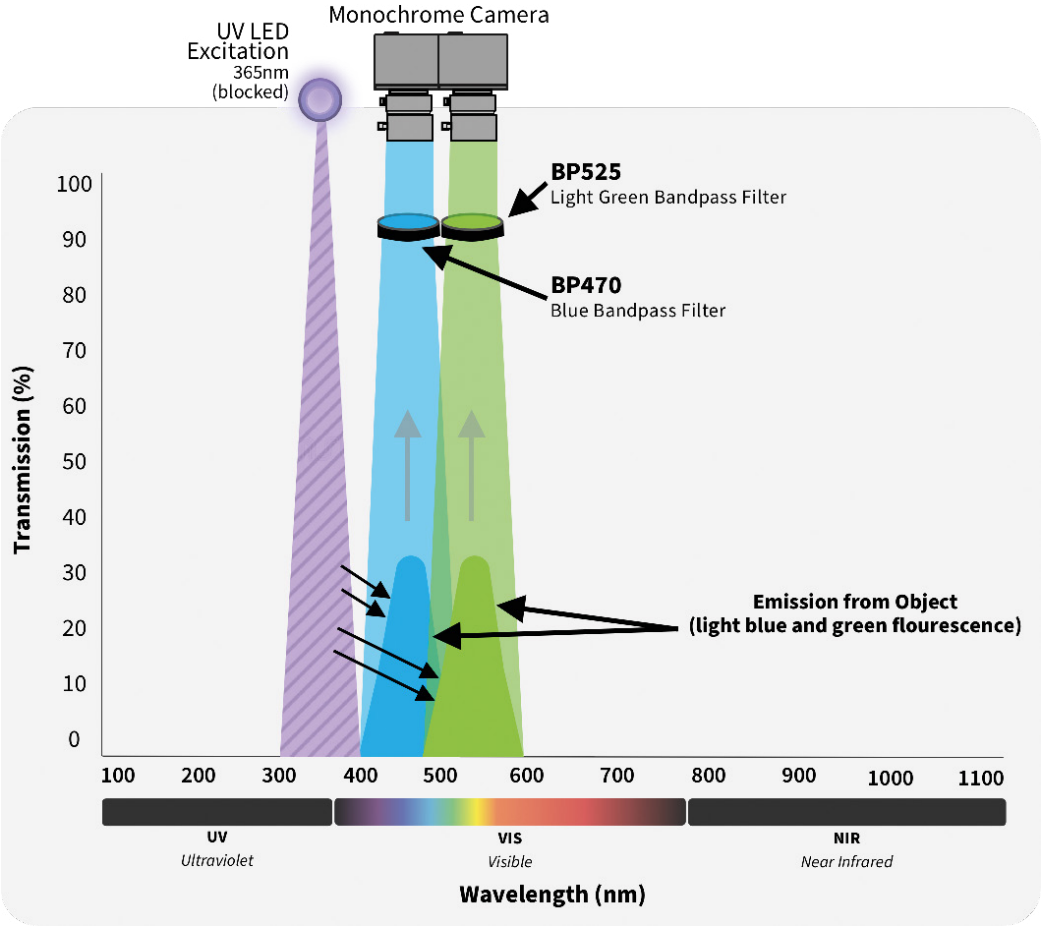


Fig. 1: In machine vision systems, optical filters play an essential role in deciphering the fluorescence emission from the UV light source used for excitation, often overpowering the emission.

Bandpass Filters Excel in UV Fluorescence Applications

Sap Side of Wood Used for Railroad Ties Is Detected by Bandpass Filters

Railroad ties are mainly made of wood. In the production process fluorescent paint helps to determine the wood's sap side orientation. A combination of red and green bandpass filters from MidOpt ensures that there is sufficient contrast between the fluorescent paint marker and the steel plates that are used to strengthen the wood.

Ultraviolet fluorescence applications, commonly utilized in life science, offer creative solutions in many industries, including industrial, railroad and consumer packaging. Product appearance heavily influences a consumer's decision to purchase, so by printing a 2D matrix code in invisible ink, manufacturers can easily track and trace products without compromising product appeal. When a UV light source illuminates the UV ink, the UV energy is absorbed by phosphors. The phosphors become excited and convert the UV energy into visible light.

Deciphering Fluorescence

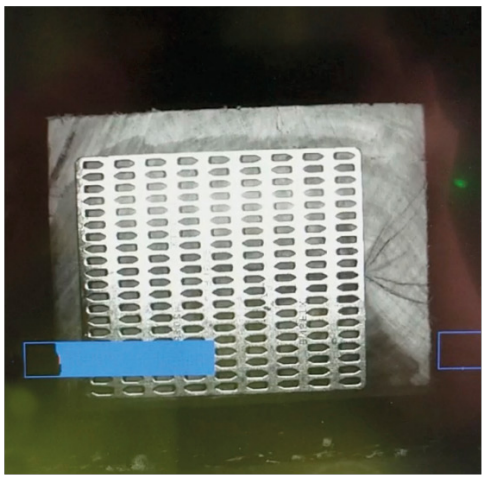
In machine vision systems, optical filters play an essential role in deciphering the fluorescence emission from the UV light source used for excitation, often overpowering the emission. The underlying technique is the same, whether the application is reading invisible ink or detecting oil or the presence of sap on a railroad tie.

MidOpt offers a variety of bandpass filters tailored for diverse applications in the ultraviolet, visible and near-infrared regions. For instance, when paired with UV LED lighting, in a fluorescence application the BP470 Blue Bandpass Filter helps users achieve stunningly bright, high-contrast images, making this filter a vital, leading component of machine vision UV fluorescence applications. For green LED lighting and UV fluorescence applications, the BP525 Light Green Bandpass Filter excels, providing higher peak transmission and better blocking of UV wavelengths than all-dichroic green bandpass filters.

Skye Gorter, CEO and Solution Lead for Skye Automation, is pleased with how the MidOpt BP525 and BP470 filters have performed within his UV fluorescence applications. He has been using the bandpass filters and other products for five years. He noted that the company's staff has provided him with sound technical support from early on in his launching of his own company.

Detecting Sap Side Orientation for Railroad Ties

One of Gorter's recent UV fluorescence applications has focused on detecting the sap side orientation of railroad ties for a railroad industry customer. "The sap side refers to the outside of the tree, which, of course, would be the base product for the railroad tie," he said. Determining this orientation is critical, because "when the railroad bed is made, if they put the sap side down, that part of the tree is less dense, so it will rot faster. So, they



BEFORE: Monochrome Camera, Ambient Light, No Filter

AFTER: Monochrome Camera, UV Light Source (365nm), MidOpt BP525 Light Green Bandpass Filter

Fig. 2: When a railroad tie with an endplate runs through the inspection system, the UV light with a bandpass filter is used to ignore the highly reflective end plate and pick up on the fluorescent paint mark only, even if the marking is minimal.

want to get this sap side of the tree out, away from the ground and get the center of the tree on the ground," he noted.

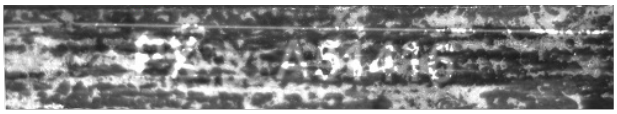
"We use a multi-spectral approach for this project," Gorter noted. When the ties have cracked and damaged ends, a fluorescent marker is used to mark the sap side of the ties before metal end plates are embedded into the wood to strengthen them. But the metal plates often obscure the fluorescent marks, leaving 'just small holes' to view those through, he said. "We needed to get better contrast between the fluorescent paint marker and the steel plate," he added.

In that scenario, using appropriate filters, paired with UV lighting makes all the difference. "We are using monochrome cameras with red bandpass filters on two of the cameras. And then we use a third camera with a green BP525 bandpass filter for a UV lighting application," Gorter said.

Another aspect of this project uses this setup to examine the growth rings of the raw tree that's 'shaped into the railroad tie' to identify its projected center, Gorter explained.

When a railroad tie with an endplate "runs through our inspection system, we use the UV light with a bandpass filter to ignore the highly-reflective endplate and pick up on the fluorescent paint mark only,even if the marking is minimal," Gorter said. "We then correlate the position of the paint mark to the position of the railroad tie to determine the correct sap side of the tie," he added.

Gorter experimented with different filters from a Midopt Test Kit before settling on the BP525 filter. "I tried a few different ones to see which ones gave me the best contrast," he explained.



BEFORE: Monochrome image without filter

AFTER: Monochrome image with MidOpt BP470 Bandpass filter and UV light source

Fig. 3: In a setup that employs the MidOpt BP470 Filter it can be detected whether a release tape is right side up or upside down.

All images: Midwest Optical Systems

Validating an Approach for Detecting Tape on a Building Product

Gorter has also been using the BP470 Filter to test and validate an approach for a UV fluorescence application involving building products. A release tape is affixed to the back side of the product, and it has numbers and letters printed on it to help users determine if it's in the correct orientation or upside down, Gorter explained. That tape is designed to prevent the product from sticking to itself and it needs to be removed before the product is installed.

Gorter compared the results he obtained by pairing the filter with a UV light to detect the tape to the results the customer obtained using a different system. Using the other system for release tape detection, "they just get this white blob," he said. But within his setup that employs the MidOpt BP470 Filter, he can detect whether the tape is "right side up or upside down." (Fig.3)

Furthermore, Gorter's setup "eliminates, really, most of the background and differentiates the lettering to a degree," he said. It even shows – through light and dark contrast – where the tape has adhered well to the building product and where it hasn't.

Considering New Applications?

When Gorter is pondering a new application, he uses a systematic process. "The first step I typically take is evaluating whether it's going to be an area scan or line scan system. And then it is determining what the goal of the project is, what type of cycle rates we need or exposure times are necessary and how the environment is going to influence our lighting and opto-mechanical setup," Gorter said.

He noted that he's drawn to continue using MidOpt Bandpass Filters and other products because "they're reliable, they deliver quickly, and the excellent technical support provided is consistent and reliable." ■

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Radiation Resistant Fixed Focus Lenses

For close inspection tasks in high radiation environments, Resolve Optics offers both a standard range and customized fixed focus radiation resistant lenses. Manufactured to high quality standards using certified glass, Resolve Optics non-tanning lenses can withstand radiation exposure up to 100 kGy (100,000,000 rads) and temperatures up to 55 °C without discoloration.

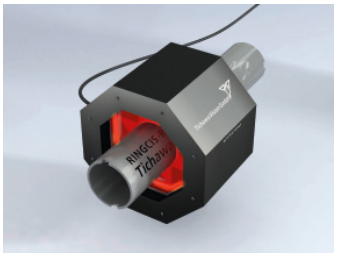
Resolve Optics offers an extensive range of non-tanning (radiation resistant) fixed format and zoom lenses for use in radiation exposed environments. All of these lenses are manufactured to the highest standards of quality and performance. The company can also provide custom non-tanning lenses.

www.resolveoptics.com

Miniature 12-Megapixel Polarized Camera

The Teledyne Flir Blackfly S Series BFS-PGE-123S6P-C polarized camera has 12 megapixels and is suitable for applications with reflective and/or difficult lighting conditions. The camera is used in traffic systems, unmanned aerial systems (UAS), inspection lines with transparent or reflective parts and in other environments with uncontrolled lighting. It combines the Sony IMX253 MZR sensor with an easy-to-use glare reduction feature built into the Spinnaker SDK. In addition, the GigE cameras with Power over Ethernet (PoE) use Teledyne's lossless compression function Flir, which achieves up to 14 frames per second at full resolution without compromising on image quality. Weighing in at 36 grams, it is significantly lighter and more compact than competing offerings on the market, according to the manufacturer.

www.flir.com



Industrial Scanner for 360 Degree Inspection

The industrial scanner Ring-CIS from Tichawa Vision is a solution for 360-degree inspection of the outside of tubes and profiles directly in the line. It makes it possible to check both round and square tubes made of glass, metal and plastic. Depending on the design, the CIS ring can scan fixed or variable diameters. In addition, it has a speed of 600m/min and a resolution of 50 to 600 dpi.

www.tichawa-vision.com
Control Hall 6 Stand 6224

Compact Camera Now Available with Senswir Sensors

Allied Vision's Alvium 1800 camera series is now also available with Sony's InGaAs SWIR sensors. The new models of the 1800 series with USB 3 Vision or CSI 2 interface can be used with the Senswir sensors in a wide spectral range from 400 to 1700 nm . The Alvium 1800 U/C-030 features the IMX991 sensor with VGA resolution, while the Alvium 1800 U/C-130 offers SXGA resolution with the IMX990.

Alvium 1800 SWIR cameras feature a compact design, low power consumption and low weight, making them a solution for compact OEM systems used in embedded and machine vision applications.

The core modules are optionally available with a USB3 Vision or MIPI CSI-2 interface with GenICam compatible function control.

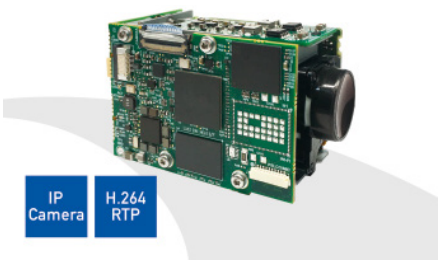
www.alliedvision.com

Version 5.1 of Merlic Released

MVTec has launched version 5.1 of the Merlic image processing software . In the update, the range of functions of the AI technology Deep Learning was expanded. In addition to the features Anomaly Detection and classification, which were already included in Merlic 5, Deep OCR has been added. In addition, MVTec has optimized hardware compatibility, which significantly speeds up deep learning applications.

Merlic 5.1 now includes a new OCR tool based on Halcon's Deep OCR technology. Compared to other algorithms, this deep learning-based approach can locate characters much more robustly, regardless of their orientation, font, and polarity, and requires significantly less parameter tuning. In addition, Merlic 5.1 includes Artificial Intelligence Acceleration Interface (AI²) plugins for the Nvidia Tensor RT SDK and the Intel distribution of the Openvino Toolkit.

www.mvtec.com



IP Networking Capability for Autofocus Zoom Cameras

Active Silicon launch their first IP/Ethernet autofocus zoom camera, bringing IP networking capability to their Harrier line of cameras and interface cards. The numerous applications for the IP cameras range from networked surveillance to industrial inspection. For example, the Harrier 10x AF Zoom IP Camera with Tamro MP1010M-VC offers a lightweight and compact 1080p camera solution suitable for remote surveillance, traffic and transportation, robotics and remotely operated vehicles (ROVs).

The advantages of IP cameras include the cost-effective cable solutions with ranges of up to 100 m, easy connection to standard PCs and Ethernet infrastructures and a standardized camera control interface (ONVIF).

www.activesilicon.com

Camera Series with an Optimized Feature Set

Basler is upgrading the MED Feature Set Dust Protection, which is available immediately and at no extra charge for eight of the 22 Basler MED Ace camera models. The new MED Feature Set Dust Protection+ differs from its predecessor in that it has an optimized production process: Basler also tests critical components during camera assembly. In specially developed test tools, the sensor and the IR blocking filter of the color cameras and the cover glass of the monochrome cameras are tested with strict detection limits. If contamination occurs, the parts are cleaned before assembly. In the final inspection, Basler tests the finished camera again using the camera test tool. In this way, Basler achieves a higher degree of cleanliness, which leads to fewer artefacts in the images and thus to higher image quality and more reliable image analyses.

www.baslerweb.com

Optical SWIR Filters Available

Chroma introduces new SWIR filters for computer vision and remote sensing. These filters offer better performance at the same cost as lower-quality interference filters, according to the manufacturer, and can significantly improve food safety inspection, machine vision systems for facility management, and many other applications.

The new range of sputter-coated SWIR optical filters for remote sensing applications are designed to optimize the signal-to-noise ratio. These filters have precise center wavelengths, narrow transmission bands, flat-top transmission, and OD4 off-band blocking.

Covering a range of center wavelengths from 380 to 2,800 nm, Chroma's Contrast-max filters offer high levels of contrast while blocking unwanted light.

www.chroma.com

Hyperspectral Cameras for Labview

EVK now enables customers to seamlessly integrate Helios NIR hyperspectral cameras into Labview. Users of image processing solutions can now integrate hyperspectral data more flexibly into complex processes, integrate measurement technology into virtual environments more quickly and automate processes.

The Virtual Instrument provided by EVK for this purpose enables existing license users of Labview and the National Instruments Vision Acquisition software to easily configure and parameterize the Helios near-infrared hyperspectral cameras and to display and process raw and classified hyperspectral data streams.

For a faster start, EVK supplies an existing reference implementation of the Helios hyperspectral cameras in Labview and thus supports customers in the integration.

www.evk.biz

Frame grabber Software Now Accessible to Python Programmers

Bitflow introduced BF-Python, an application programming interface that allows engineers with Python experience to capture images from frame grabbers. These Python bindings are now available for download from Bitflow's website and include the configuration, acquisition, buffer management, and camera control APIs of the proprietary SDK. The download also includes several Python examples that demonstrate how bindings can be used.

The Bitflow SDK supports the full range of Bitflow frame grabbers , enabling developers to integrate high-speed image capture into machine vision applications, from cost-effective simple inspection to ultra-fast, high-resolution systems. The SDK includes many sample applications with full source code to help understand the available functionality, as well as a number of development and debugging utilities. The free SDK version is intended for use with third party applications such as Labview, Visionpro and Halcon. The paid version is required for users developing their own applications and offers high-level benefits such as header files, libraries and example programs with detailed source code.

www.bitflow.com

Industrial Camera with Housing and C-Mount for Price-Sensitive Applications

The XCP camera family of the Ueye+ product line from IDS is a small C-mount body camera. The models are 29 x 29 x 17 mm in size and have a closed die-cast zinc housing with a screwable USB Micro-B connector. With cost-optimized electronics and compatibility with common lenses, they are suitable for price-sensitive applications. They are used, for example, for analysis tasks in the laboratory, as eyes in autonomously navigating vehicles in production or for visual support of robots in the automation environment.

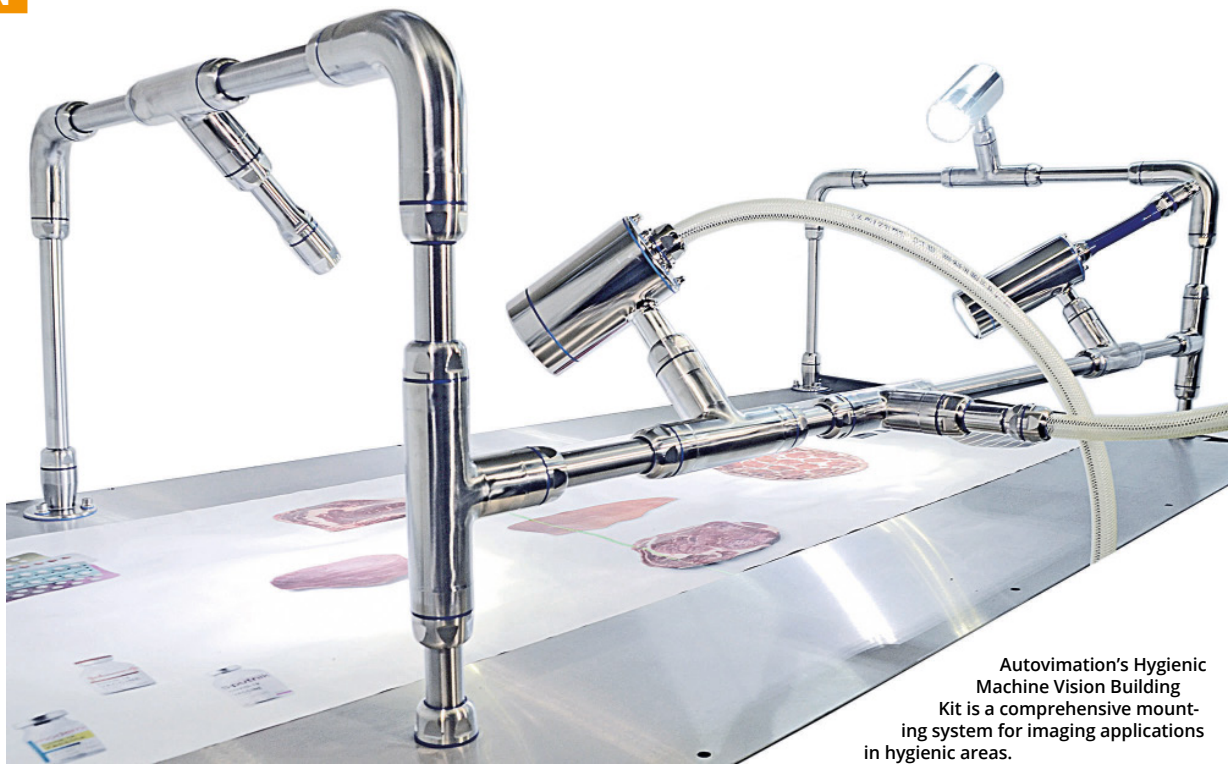
The industrial cameras will initially go into series production with the AR0234 2.3 MP global shutter sensor and the AR0521 5 MP rolling shutter sensor from ON Semiconductor. More sensors are to follow. With USB3 Vision and GeniCam compatibility, the cameras can be integrated into any image processing system.

www.ids-imaging.de

Camera Series with IP67 and GigE

Lucid Vision Labs have introduced their new Atlas 5GigE IP67 camera. The models come with Sony Pregius Global Shutter CMOS image sensors and a 5GBASE-T interface. These include the 2.8 MP Sony IMX421 sensor with a pixel size of 4.5 µm and a frame rate of 173 fps , as well as the 8.9 MP IMX255 sensor with 58.5 fps and the IMX253 with 12.3 MP and 42.5 fps and a pixel size of 3.45 µm. The Atlas Factory Tough camera line is designed for industrial applications that require high bandwidth and resolution in a rugged IP67 housing. They feature active sensor alignment, 60 x 60 mm size, M12 Ethernet and M8 general purpose I/O connectors, and are shock and vibration resistant. They also have EMC immunity and an ambient temperature range from -20 to 55 °C. Atlas IP67 models feature C-mount lenses and are compatible with Triton cameras' standard IP67 lens barrels.

www.thinklucid.com



Autovimation's Hygienic Machine Vision Building Kit is a comprehensive mounting system for imaging applications in hygienic areas.

Safe Food Inspection

Hygienic Mounting System for Machine Vision Components

The world's first complete, fully hygienic mounting system for imaging components combines a stainless-steel frame design with hygienic camera enclosures.

Electronic imaging components used in processing and packaging lines in the food and pharmaceutical industries must meet the same exacting hygiene requirements that apply to machinery and equipment in direct contact with foodstuffs. While cameras, line lasers and lighting are usually installed above conveyors, without direct contact with critical products, there is nevertheless a high risk of pollution. Product residues swirled up during steam-jet cleaning can drip down onto food processes the next day. In order to prevent contamination, machine vision components in hygienically sensitive zones must be housed in suitable enclosures that enable easy, thorough cleaning and disinfection. Equally, mounting frames for devices and enclosures must be designed to avoid any bacteria buildup and enable easy disinfection. Up until now, the market offered no comprehensive mounting systems. Operators had to either resort to their own special designs and/or accept increased effort for cleaning and disinfecting their machine vision setups.

First Modular Construction Kit to Hygienic Standards

The Hygienic Machine Vision Building Kit from German manufacturer Autovimation – the first of its kind – now closes this gap. It is an economic, complete solution that can be individually configured to the application requirements. Any number of cameras, lasers, lights and other components and devices can be freely aligned and oriented. The system is intentionally designed as a modular building kit for flexible, scalable designs. It includes stainless-steel rods, hygienic 90° elbow rod connectors and T pieces, front and rear mount feet and cable glands for building a hygienic mounting frame that holds hygienic IP69k enclosures for cameras, lighting, and lasers.

Easy Configuration of Bespoke Vision Systems

One of the many advantages of the building kit – it works equally well standing upright or suspended from the ceiling. Using the hygienic 90° elbows and front mount feet, the steel rods can be installed above a conveyor. Protective camera enclosures are mounted using the T pieces, which enable flexible camera orientation in any angle and position. Cable routing inside the rods is another feature of the system that saves users a lot of time and effort. Not only are the cables optimally protected against mechanical damage, but they also no longer need a separate food approval either. For a bespoke configuration, users now simply shorten the rods to the required length and drill a hole for the cables where they wish to position the camera – this will be fully covered and sealed by the T piece. At the opposite end, the cables are guided into control cabinets or machine enclosures through front or rear mount feet, which also ensure perfect sealing. Alternatively, hygienic tubes are available for the final leg, guiding cables into enclosures or existing wiring ducts.

Modular, Scalable Components

The stainless-steel rods are connected via 90° elbows. T pieces also allow users to extend the reach of the frame in a desired direction, for example, in order to install line

Piranha-series hygienic protective laser enclosures

T pieces, used as fixtures for protective camera enclosures, enable cable routing within the mounting rods.

Hygienic camera enclosures from the Shark series (with an integrated Meganova ring light) and Dolphin series

lasers for laser triangulation. The connectors provide tight IP69k sealing of the mechanical interfaces. Their robust internal clamping ensures sturdiness even in installations with longer rods and off-center loads. Autovimation offers the 30 mm diameter steel rods in standard lengths of 0.5, 1, 1.5 and 2 m. Other lengths are available on request. The range of accessories also includes front and rear mount feet for attaching the stainless-steel rods to the floor or wall or a metal machine cover. These are designed for screw-attachment from the front or from the rear, for example, from inside a control cabinet. All parts of the modular building kit, including screws and nuts, feature a curved outer geometry to let liquids drain easily. All joints are sealed with gaskets made of hygienic, chemical-resistant FDA-approved elastomers that avoid recesses and dead spaces and prevent contamination. The same holds for the blind plugs for sealing open rod ends.

Hygienic Protective Enclosures for Cameras, LED Lights and Lasers

For hygiene conformity, the manufacturer uses Hygienic Plus versions of its Dolphin, Shark, and Piranha enclosures to protect cameras, LED lights and lasers. Featuring a < 0.8 µm surface roughness and IP69k protection, these enclosures made of AISI 316L (V4A) stainless steel prevent germ deposits and withstand steam-jet cleaning. All seals and tubes are approved for direct contact with foodstuffs by the FDA and according to EU regulations 10/2011 or 1935/2004. The sealing materials provide high chemical and temperature resistance and withstand fats and mineral oils as well as aggressive acids and bases in the long term.

Shark Enclosures for Larger Cameras

Autovimation's Shark and Dolphin protective camera enclosures fit a wide range of compact cameras. The Shark series is designed for cameras with lens diameters up to 85 mm and housing dimensions up to 60 x 60 mm. The internal installation space in S, M and L enclosure sizes is 143 mm, 193 mm or 263 mm long and can be increased, if necessary, by using 30 mm long enclosure extensions. The innovative Meganova ring light, available in five light colors, fits in Shark camera enclosures. Eight 1W Oslon LEDs arranged around the camera lens ensure optimum lighting of the area of interest. Customer-specified beam angles are configured ex works by means of lenses. The Meganova ring light's onboard flash controller allows users to set the pulse length, the trigger behavior, amplitudes up to 570 percent of the nominal current and various other parameters. The camera trigger output connects directly to the ring light's opto-isolated trigger input. This simplifies cable management and ensures accurate response times in high-speed flash applications.

Dolphin Enclosures for Smaller Cameras

The Dolphin series caters to smaller compact cameras. The enclosures in three lengths accommodate camera formats up to 29 x 47 mm and 40 x 40 mm. The Dolphin L enclosure houses cameras with a total assembly length of up to 222 mm. If more space is needed, 30 mm enclosure extensions are available for this series as well. As with the Shark series, any camera optics can be positioned directly behind the front window. The patented Quick-Lock/Heat-Guide camera mount provides excellent heat dissipation from the inside of the enclosure and cools the housed camera down by about 15 °C. Both enclosure series are available with front windows made of FDA-compliant acrylic or BK7 glass, germanium, sapphire, or heat protection glass. Cable output is either through a hygienic cable gland at the rear or through the enclosure handle, which directly connects to a T piece or elbow and is completely sealed.

Piranha Line Laser Enclosures

The robust protective enclosures from the Piranha series are used to integrate line lasers with a diameter of 19 to 20 mm. The 28 mm wide front window, which can be easily attached or replaced by means of a circlip, comes with a BK7 window with double-sided anti-reflective coating, or optionally with a sapphire or food-grade acrylic window. The deep front cover allows lasers with or without a manual focusing ring to be placed directly behind the front window. Users can access the focusing ring at any time, simply by removing the screw cap. Since Piranha enclosures are typically installed using the hygienic T pieces, Autovimation supplies them with a standard cable gland made of AISI 316L stainless steel. Alternatively, versions with hygienic cable glands are available.

Conclusion

Autovimation is virtually the only manufacturer of special enclosures and positioning systems that can be used universally with different camera brands and in the most demanding industrial conditions. The Hygienic Machine Vision Building Kit is yet another trailblazing innovation that standardizes and considerably simplifies camera installations in particularly sensitive applications. For users to easily achieve compliance in every application, the manufacturer is preparing the full EHEDG certification of all components of the building kit. ■

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All images: Autovimation

Powerful 3D Sensor Generation

Advanced 3D Measurement Technology for Inline Inspection Systems

3D sensors for high-resolution geometry and surface measurements detect smallest deviations and measure most precisely.

Micro-Epsilon presents a new generation of 3D sensors which are based on a common software platform. The surfacecontrol, reflectcontrol and scancontrol sensor systems are used for high-resolution geometry and surface measurements and detect the measuring object by scan or by single snapshot allowing fast inspection. In contrast to conventional 3D systems with 2.5D evaluation, Micro-Epsilon's Valid3D technology enables a complete representation and precise evaluation of the 3D point cloud.

The surfacecontrol 3D 3500 inspection system, a 3D snapshot sensor, is designed for inline inspection of geometry, shape, and surfaces in the production line. With a z-axis repeatability of up to 0.4 µm, the sensor sets new standards in high precision 3D metrology. This enables reliable detection of even the smallest deviations in flatness and height. The measurement can be performed on diffuse reflecting surfaces such as metals, plastics, or ceramics with the highest precision and at the same time high speed data processing. In addition to the data output via Gigabit Ethernet, the sensor offers an additional digital I/O interface. The 2D/3D Gateway II supports EtherNet/IP, Profinet and Ethercat connections. Software tools enable precise 3D measurements and surface inspections. GigE Vision compatibility also allows easy integration into third-party image processing software. The comprehensive SDK for customer software integration rounds off the software package.

The reflectcontrol sensor is designed for 3D measurements on reflective and glossy surfaces. The system detects flatness deviations in the range of a few micrometers. The sensor can be used in a stationary mode for monitoring a production line or for inline inspection on a robot. This compact sensor generates a striped pattern which is mirrored by the surface of the measuring object into the sensor cameras. Deviations on the surface cause distortions of this striped pattern, which are evaluated by the software.

Scancontrol laser scanners are among the most powerful profile sensors worldwide in terms of their accuracy and measuring rate. To generate 3D scans, the scanners are moved over the measuring object or vice versa. The laser scanners from Micro-Epsilon are characterized by high dynamics, precision, and their compact size. Due to the low sensor weight, they are also suitable for mounting on robots. With the scancontrol 3000 and the new scancontrol 3002 series, Micro-Epsilon offers a comprehensive portfolio with numerous measuring ranges, red and blue laser technologies and additional accessories. The scanners are equally convincing for system integrators and for series use in the production line. They can be integrated into image processing software packages via the Ethernet/GigE vision interface.

With the 3D Inspect software tool, Micro-Epsilon has developed a uniform solution for 3D measurement. Their 3D sensors are compatible, regardless of the measuring principle used. For system integrators, this 3D package is also attractive, as high compatibility is enabled via the GenICam standard. The parameterization of the sensors and the recording of the measurement data are done directly in the 3D Inspect software tool. The 3D point cloud generated in this way can then be further processed as desired. Data export in ASCII and STL or PLY format is possible. The new Valid3D technology ensures lossless display and processing of the point clouds. This is how scanned 3D objects can be moved arbitrarily in the coordinate system. ■

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Image: Micro-Epsilon Messtechnik

On the Spot

Robust Spot Illumination in IP69K for Inspection and Manufacturing with Frequent Cleaning Processes

Built for extreme environments, IP69K certified lights are specifically engineered to withstand everything from prolonged liquid immersion to high-pressure steam cleaning and corrosive washdown solutions.

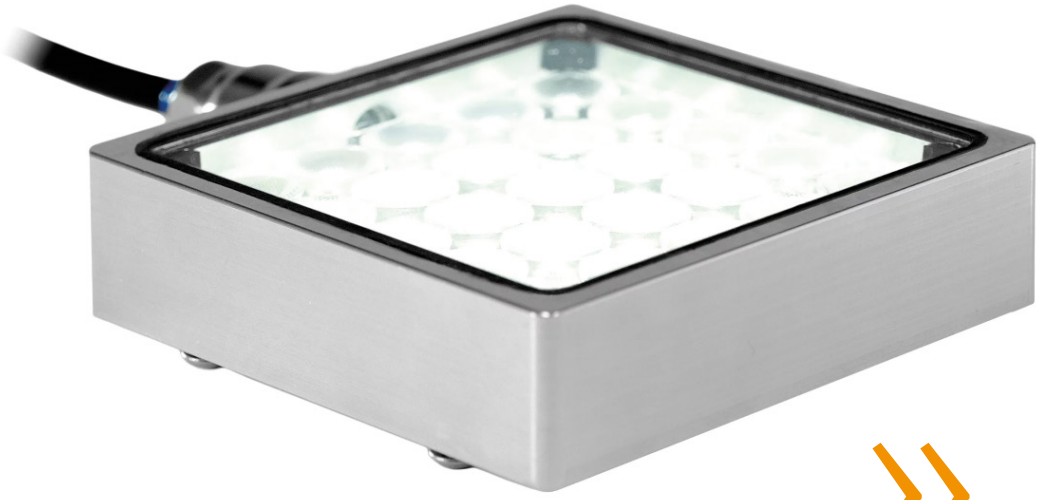

Image: Advanced Illumination

Advanced Illumination, a long-time partner of Olching-based machine vision company Rauscher, has introduced the SL316 universal, high-intensity spot illumination. Its IP69K design makes this illumination particularly suitable for applications with high demands on robustness.

The development of the SL316 was designed to ensure its proper function even after prolonged immersion in liquids, frequent high-pressure steam cleaning and after the use of corrosive cleaning solutions without compromising on the need for an additional protective housing.

The SL316 is an addition to Advanced Illumination's Ultraseal Washdown series and delivers consistent intensity of over 150 klx at 300 mm working distance in continuous operation. The spot illumination is available in a variety of narrow, medium, and wide beam angles, as well as a lens-free, high-diffusion configuration, and can be configured in eleven different wavelength options from visible to infrared wavelengths. In terms of control, users also have numerous options to flexibly adapt the spot illumination to their specific requirements: The lighting solution can be operated in four modes: continuous, triggered, pulsed and adaptive pulsed, as well as with dimming options for brightness control.

Due to its robust and hygienic design, the IP69K spot illumination available from Rauscher is optimally suited for application fields such as the food and beverage industry, hygienic inspection environments as well as aseptic manufacturing processes in which the image processing components used are exposed to frequent cleaning processes with sometimes aggressive agents. ■

Due to its robust and hygienic design, the IP69K spot illumination is optimally suited for application fields where the image processing components used are exposed to frequent cleaning processes with sometimes aggressive agents.«

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Evolution in the Press Shop

Intelligent, Camera-Based Tool Protection in Stamping and Forming Technology

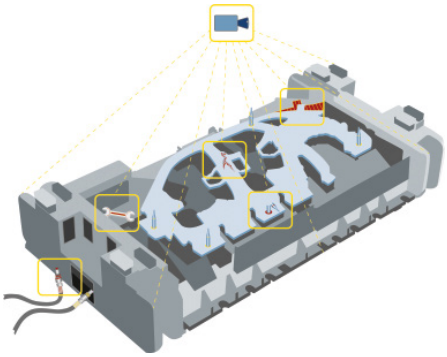
Retrofitting lines in the press industry with vision technology avoids replacements and helps to keep up with the peers.

Boosting efficiency through digitalization – almost no branch of industry can evade it. Also, operators of press shops are increasingly networking their production. But – regardless of whether it's a single press or press lines – it's not always necessary to replace the entire plant in order to stay up to date. Retrofitting existing lines, true to the principle of "sensible evolution instead of cost-intensive revolution", is often the order of the day. With Visual Die Protection, Schuler Pressen from Göppingen offers a solution for avoiding expensive die damage and its consequential costs in stamping and forming technology – retrofittable for existing lines. Equipped with industrial cameras from IDS Imaging Development Systems and intelligent software, the production process can be monitored as required.

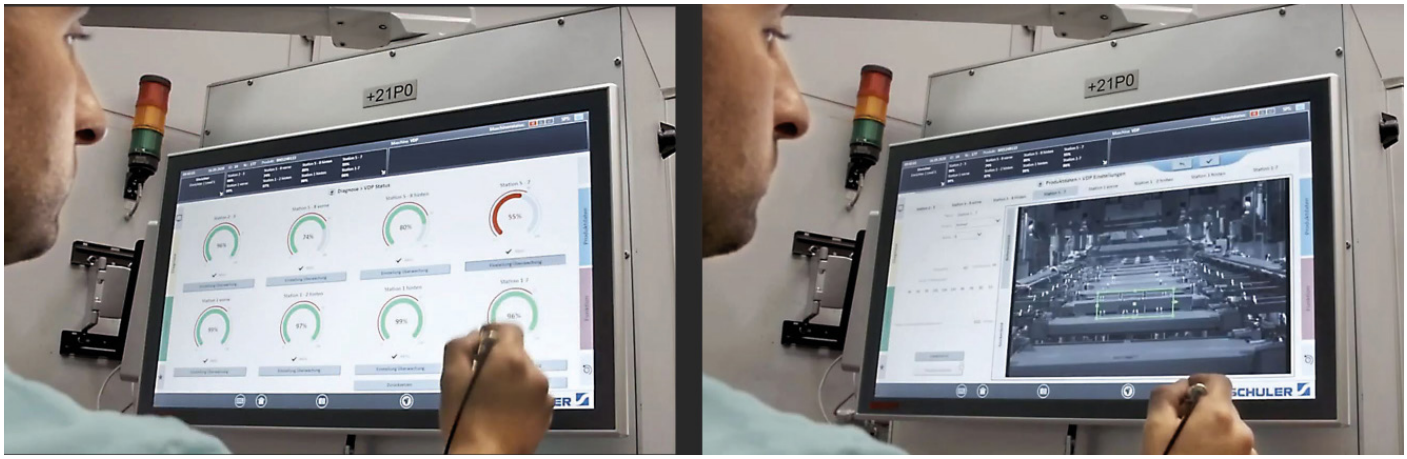
Visual Inspection System Detects possible Damage Causes at an early stage

The principle of the system is simple: Visual Die Protection (VDP) detects possible causes of die damage in the press shop at an early stage and stops the line in fractions of a second before damage and downtime occur. Different monitoring functions can be set up for the various areas in the press installation space. This way, a wide range of error sources can be covered to prevent unforeseen incidents. The probability of failure is reduced, and the safe operation of the systems is ensured.

The control functions range from checking the component position to foreign object detection and in-process inspections to the targeted monitoring of individual tool functions. For example, if a foreign object, such as a scrap of sheet metal from the previous press pass, is detected in the die, the press stops automatically so that the foreign object cannot push into the die surfaces or cause damage.



One or more IDS industrial cameras monitor the tool room.



The system detects unexpected causes of faults and stops the press.

For this purpose, two to four cameras per system monitor the tool room of the press or, if desired, other areas of the plant, such as the scrap chutes. At each stroke, the current process is compared with the target state. If the process deviates significantly from the norm, e.g. due to the above-mentioned foreign object in the tool, the system is stopped and damage and its consequential costs are prevented.

In addition, all image and analysis data are available to the customer for complete traceability. For continuous improvement processes, the system simultaneously links image and process data and optimizes its settings with the help of intelligent data analyses. It only intervenes in the production process when there is a critical deviation. Visual Die Protection thus ensures greater process reliability of production plants, prevents tool damage, increases plant availability, and secures the user's ability to deliver. Especially in just-in-time supply chains, this is a decisive competitive advantage.

Four Cameras Monitor the Tool Room

The system can be used for a wide range of monitoring tasks, even outside the actual pressing plant. Thanks to the easy retrofitting of existing systems and the wide range of applications, the monitoring functions can be set up in just a few minutes. Accordingly, customers benefit immediately from camera-based tool protection. That also applies to non-Schuler systems. With the help of product data handling, even monitoring of already set-up tools can be loaded and monitored from the first press stroke.

The image data on which the Schuler system is based is supplied by uEye CP industrial cameras from IDS. CP stands for "Compact Power" and symbolizes compact, visual power packs for industrial applications of all kinds. They offer maximum functionality with extensive pixel pre-processing and are perfect for multi-camera systems thanks to the internal 120 MB image memory for buffering image sequences. The GigE cameras with a size of only 29 x 29 x 29 mm score particularly well in terms of light sensitivity, dynamic range and color reproduction. This makes them predestined for applications that need to deliver a perfect result even in low light conditions, such as in quality assurance or automation. "The quality of the image data convinced us. Even under rather unfavorable lighting conditions in press shops, the camera provides perfect source material for our inspection systems," explains Christoph Pölzl – Project Manager in the Digital Solutions division at Schuler Pressen. For integration, the company used the IDS Camera Manager, a central and convenient tool for managing all uEye industrial cameras.

Outlook

Visual Die Protection has been on the market since 2019 and has since established itself in stamping and forming technology as a reliable visual protective tool. With artificial intelligence and industrial cameras, it provides a clear view in the press shop. "For the future, we expect a continuously growing market," predicts Pölzl. In addition to process and tool monitoring, further applications in the area of in-process quality monitoring are added. In addition, the diagnostic tools for linking image and process data are also constantly being expanded. ■

The quality of the image data convinced us. Even under rather unfavourable lighting conditions in press shops, the camera provides perfect source material for our inspection systems.«

Christoph Pölzl,
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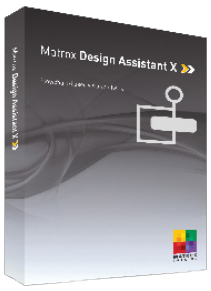
All images: Schuler Pressen



Matrox Design Assistant Vision Software Is Released in Version 2109

Matrox Imaging has released version 2109 of its Design Assistant X vision software. It is available in Germany and Austria from Rauscher.

With many new features, version 2109 of Matrox Imaging's Design Assistant X vision software accelerates and simplifies application development. It has been optimized primarily for use in 3D image processing applications. In addition, it includes better 3D representation and meshing functions for visualizing 3D scan data as well as new algorithms for cropping point clouds and calculating the volume of test objects.

Other important innovations include the possibility of OPC UA communication for interaction with manufacturing systems in accordance with Industry 4.0, the integration of high dynamic range recordings (HDR) for images with enhanced contrast, use of operator interface charts to graphically display results and trends, and run-time execution monitoring and reporting for easier troubleshooting and optimization of projects. Added support for the intelligent cameras of the Matrox Iris GTX series and the MIL Copilot tool for effective training of deep learning classifiers.

Matrox Imaging's interactive Design Assistant software combines the flexibility of image processing libraries with the simplicity of vision sensors. It enables programs to be created for 2D and 3D image processing systems based on PC systems or intelligent cameras, as well as for time of flight, SWIR or multi-camera projects.

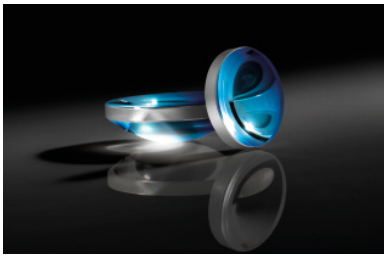
www.rauscher.de

Camera for High Performance Imaging Applications

Teledyne Dalsa is now mass-producing the Falcon4-CLHS M4480 camera. It is based on the Teledyne e2v Linze 11.2M monochrome sensor. The model is an easy-to-use camera with a CLHS interface and is designed for industrial imaging applications that require high-speed data transmission. It achieves a frame rate of 609 frames per second at full 11.2 MP resolution and several thousand frames per second in partial scan mode. When using the sensor's binning mode, it enables a pixel full well capacitance in excess of 160 Ke.

The Falcon4-CLHS uses standard cabling technologies such as CX4 and optical fiber (AOC) to increase transmission length and speed. The cameras were developed to enable reliable results in industrial image processing applications at high speed.

www.teledynedalsa.com



Imaging and Near-Infrared Aspheres

Edmund Optics has expanded its range with new aspheres. This includes the Techspec series double-sided aspheres, which are suitable for imaging as well as the precision near-infrared aspheres of the same series. These two products represent a wide range of new aspheres that Edmund Optics has added to its portfolio.

The double-sided aspheres have numerical apertures diameters between 10 and 500 mm and are the right choice for light collection or 1:1 scale imaging. The double or biconvex shape reduces the number of optical elements needed in the system and the size and weight of the system.

The precision near-infrared aspheres eliminate spherical aberrations in the near-infrared spectrum. The uncoated substrate is optimized for 780 nm , the coated versions are available for 350 to 700 nm , 600 to 1,050 nm and 900 to 1,700 nm .

www.edmundoptics.com

Software for 3D Sensors Simplifies Their Operation

With the update of its CX Support Package 2022.2, Automation Technology (AT) provides an optimized kit of programs with which the company's 3D sensors can be used quickly and easily. These tools make it easier, for example, to take pictures, configure the 3D camera or provide 3D data in the form of range maps or point clouds.

The package includes, among other things, the CX Explorer, CX Discover, CX Show3D and CX SDK, with the SDK in particular, which contains all the libraries for communication with the 3D camera, being significantly expanded. With the latest version, AT has revised the so-called wrappers , which simplifies the connection to programming languages such as Python, C++ or C#. There were also extensions regarding the compatibility of the multipart support for AT's C6 series.

www.automationtechnology.de

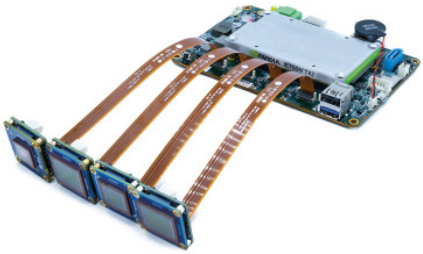
Frame-Based Hyperspectral Cameras for the VNIR Spectral Range

The HSC-2 hyperspectral cameras from the Finnish manufacturer Senop are frame-based and provide snapshot recordings in the VNIR spectral range with up to 1,000 narrow spectral bands. This distinguishes them from conventional line-based HSI cameras. The number and position of the spectral bands can be freely defined. In this way, users can optimally adapt the frame rate and data volume to their respective needs.

The system provides true image information with a resolution of 1 megapixel. The frame-based approach with integrated positioning and IMU enables easy stitching for high-resolution images.

The application sectors include agriculture, forestry and water management, industry, research, medicine and forensics.

www.polytec.com
Control Hall 5 Stand 5502



Carrier Board for Embedded Vision

Teledyne Flir introduces the Quartet TX2 carrier board. It enables four USB3 board cameras to be streamed simultaneously with full bandwidth. This carrier board with TX2 is suitable for space-constrained applications as it does not require peripherals and host systems. The Spinnaker SDK is already pre-integrated in the embedded solution. The Quartet TX2 carrier board combines power and data transmission via one cable per camera - for a footprint of 138 × 92 × 18.2 mm. Integrators can now design compact vision systems with the TX2 module, allowing a powerful Single Board Computer (SBC) to be integrated into space-constrained vision systems. In addition, the Nvidia Jetson Deep Learning hardware accelerator enables a complete decision-making system to be installed on a compact circuit board.

www.flir.com

Telecentric 1:1 Lens

Sill Optics has introduced a new telecentric lens called the S5LPJ7201/M42. It works with a reproduction scale of 1:1 and offers a high resolution for a sensor diagonal of up to 32mm (APS format). The lens shows a high imaging performance up to a pixel size of 2.4 µm and is suitable for monochrome sensors and color sensors with Bayer pattern. In addition, the lens can be used in NIR applications (800-900nm) with high transmission and good imaging performance up to 3.45µm pixel size.

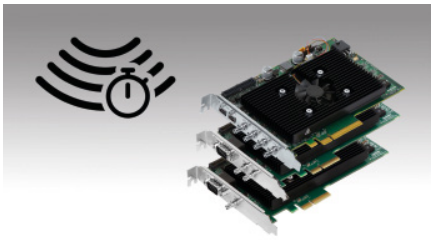
www.silloptics.de

Performance Camera Series Available Immediately

With the CMOS industrial cameras of the FXO series SVS-Vistek has an alternative in its range with short-term availability due to the regional structure of the partners and suppliers and a high degree of in-house production depth.

The FXO cameras are based on Pregius S image sensors from Sony's IMX54x series. Images with a dynamic range of typically 72 dB can be generated from small 2.74 µm pixels with global shutter. The FXO models are available with resolutions from 5 to 24.5 megapixels and frame rates from 30.4 to 124 frames per second and thus cover a wide range of applications. When it comes to the interfaces, users can choose between the 10GigE interface for inexpensive, packet-oriented applications or the CoaXPress 12 interface for requirements with the lowest latency.

www.svs-vistek.com
Control Hall Hall 8 Stand 8302



Event Logging Tool for Frame Grabbers

Matrox Imaging has published Gecho. This is an event logging tool for Matrox Rapixo CXP frame grabber. Matrox Gecho helps developers optimize image capture and ensure proper performance. The utility logs ingestion activities so users can troubleshoot ingestion errors and measure latencies and execution times to identify performance bottlenecks.

The event logging utility strengthens the capabilities of Matrox 's established suite Rapixo CXP frame grabbers. These quad, dual and single-input CoaXPress 2.0 frame grabbers support data rates of up to 12.5 Gbit/s (CXP-12) per connection and offer Power over CoaXPress (PoCXP) support. Certain models can also distribute image processing loads across multiple computers using a data forwarding feature.

www.matrox.com

Fully Automatic Surface Inspection for Shiny Components

Deviations in shape and defects in shiny components can hardly be seen with the naked eye. That's why Specgage 3D sensors from Isra Vision use deflectometry to inspect surfaces fully automatically.

For this purpose, a reflected stripe pattern is recorded and evaluated by several cameras. The object geometry is reconstructed from the recorded image sequence and compared with the CAD model. At the same time, the sensor detects local unevenness and cosmetic defects on the surface, such as paint defects, inclusions, scratches or orange peel skin. All defects are classified and documented. The conclusions drawn from this allow rapid process adjustments and optimal productivity. Thanks to short measurement times and parallel measurements, a high clock rate can be achieved.

www.isravision.com
Control Hall 3 Stand 3202

Focal Lengths for Ultra-Compact Lens Series

The particularly small and light Kowa JC-5MC series was supplemented by the focal lengths 35 and 50 mm. Kowa's optical designers were able to design the JC5MC series with a maximum length of 27 mm and a weight of 55 g. The lenses are therefore suitable for use with smart and stereo cameras where space in the camera body is limited.

JC5MC series is optimized for 5MP cameras with a chip size of 2/3" and a pixel size of 3.45 µm . This makes them fit for the Sony sensors IMX250, IMX252, IMX264, IMX265. The click iris function and compact design also make the JC5MC series more shock and vibration resistant than conventional industrial lenses. In addition, the series has good transmission from the visible to the near infrared range.

The series is now available with focal lengths of 8, 12, 16, 25, 35 and 50mm.

www.kowa-lenses.com

To help cosmetics packaging stand out on crowded store shelves, colorful, shiny, or metallic design highlights are applied through a process called hot foil stamping.

Image: iStock - Getty Images

Image: Technoshell Automations Pvt.

Eye-Catching Accuracy

Hot Foil Stamping Machine Offers Machine Vision Solution Fully Integrated with PLC and HMI Systems

A hot foil stamping machine was taken to the next level by increasing output and mastering accuracy challenges. This became possible by integrating machine vision, PLC and HMI systems for optimum synchronization.

Colorful, shiny or metallic design highlights help cosmetics packaging stand out on crowded store shelves. They also help strengthen a brand's image and build customer loyalty. Known in the packaging world as high-visibility enhancements, these eye-catching elements are typically applied using a process called hot foil stamping.

First Impressions for Competitive Edge

With nearly 30 years of experience designing and manufacturing hot foil stamping machines, Technoshell maintains its competitive edge through early adoption of the latest technology advancements. Seventeen years of collaboration with B&R have helped the company continually improve the traditional hot foil stamping process.

"First impressions are very important in the cosmetics industry," says Technoshell's technical director, Nikhil Baste, "so companies put a lot of effort into how their products are packaged." At the same time, manufacturers are under pressure to make their cosmetics packaging lines more and more efficient. For its new hot foil stamping machine, the TSMglitter-60, Technoshell was therefore looking for a way to boost machine output while solving the accuracy challenges associated with stamping the curved surface of tube packaging.

Precision in Every Direction

The process of hot foil stamping transfers colorful, shiny or metallic design elements from a carrier film onto products or packaging using heat and pressure. Even when the decorative foil is being applied to a flat surface, high-quality results rely on precise alignment of the foil, die and products. When the surface of the product is curved, like the tubes used for many cosmetic products, positioning precision becomes even more challenging.

To guarantee accuracy in both the radial dimension (parallel to tube rotation) and the axial dimension (perpendicular to it), Technoshell needed to accurately detect registration in both dimensions. And to achieve the high throughput they were after, that would need to be tightly synchronized with motion control axes at very high speeds.

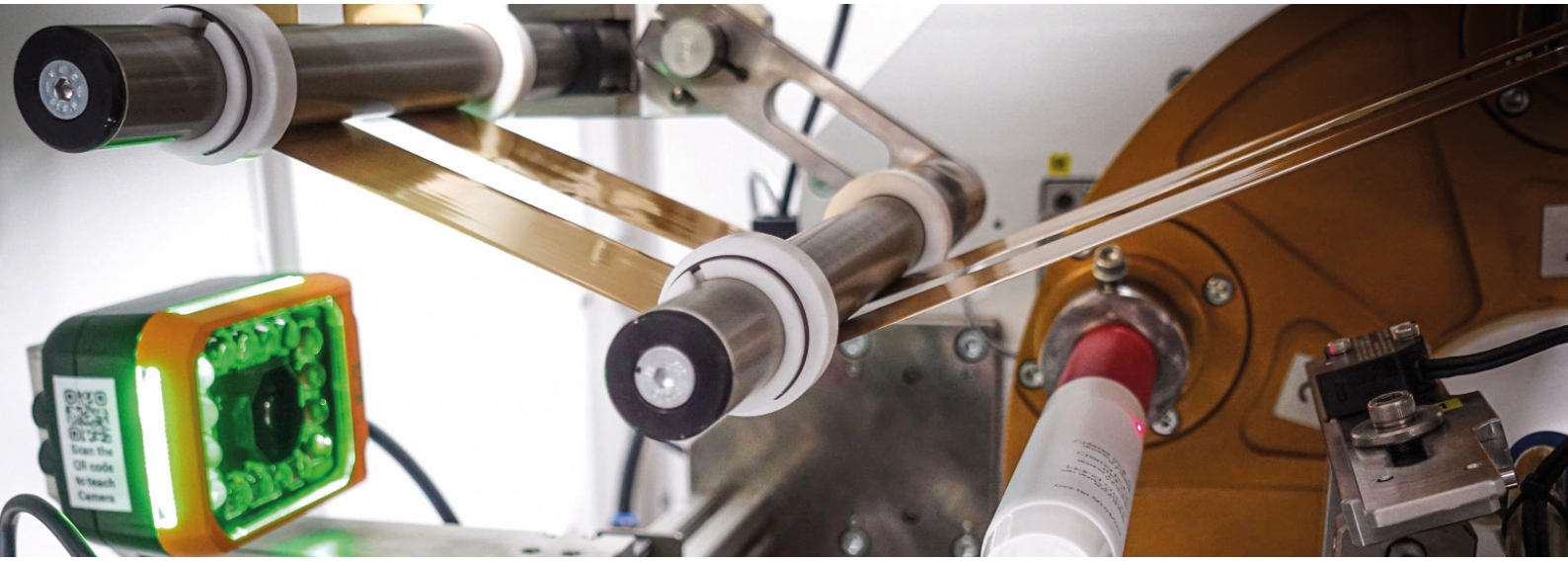
Machine Vision for Unmatched Accuracy

Together with B&R, Technoshell solved these challenges by creating a hot foil stamping machine to offer a machine vision solution that is fully integrated with the machine's PLC and HMI systems. "The tight integration makes it easy to synchronize the machine and camera very effectively," explains Baste.

Along with other parameters, the B&R machine vision system identifies the position of the tube in both the axial and radial dimensions and compares the data against a previously learned image. A matching score is calculated and used to compensate the position of the tube for improved stamping accuracy. The B&R camera's integrated light-

Technoshell Automations

Based in the western Indian city of Nashik, Technoshell has delivered over 900 printing and packaging solutions to reputed brands around the world for hot foil stamping, tube capping, tube labeling and tube packing. The company has recognized that technology is redefining the cosmetics packaging industry and staying competitive requires constant innovation.



The machine vision camera compares what it sees against a previously learned image to fine-tune the alignment of foil, stamping die and product.

ing is able to illuminate each tube in the color that increases contrast for reliable detection.

Fewer Components, Smaller Footprint

B&R's Acopos P3 servo drives allow Technoshell to implement the positioning control in only a third of the cabinet space, and a Panel PC 3100 combines PC and HMI in a single device. "We were able to reduce the number of automation components and minimize both footprint and cost," says Baste. "And since all the automation components are connected on a single, high-speed Powerlink network, the TSMglitter-60 is able to operate in perfect synchronization."

He also notes that Technoshell's engineers were able to implement the machine vision solution right along with the rest of the machine automation in the familiar environment of B&R's Automation Studio. "Having a single tool for all aspects of automation – from engineering and version management to commissioning and diagnostics – is one of the highlights we always enjoy in having B&R as our automation partner."

This is integrated automation:

- fewer components, smaller footprint;
- 20 percent higher output, 40 percent higher accuracy;
- one network, one engineering tool.

Partners in Innovation

With the B&R machine vision solution, the new hot foil stamper had no trouble hitting its target speed of 60 tubes per minute and delivering an accuracy of ±0.1 mm axially and ±0.15 mm radially. "The TSMglitter-60 achieves a combination of price and accuracy that is unmatched anywhere in the world," Baste says proudly. "It offers 40 percent greater stamping accuracy and 20 percent higher output than its predecessor – thanks to integrated machine vision technology from B&R."

When it comes to solving the industry's demands for improved precision, productivity, availability and easy maintenance, Baste credits the long partnership with B&R that allows them to benefit from the latest advancements in automation. "Thanks to the world-class training that B&R offers, our engineers are able to implement new technologies like machine vision very effectively," Baste notes. "It's always inspiring to be on the leading edge, and we have a lot of very interesting ideas for new projects with the B&R team in the future." ■

A hot foil stamping machine to fully integrate machine vision with its PLC and HMI systems: the TSMglitter-60 achieves 40 percent greater stamping accuracy and 20 percent higher output than its predecessor.

Image: Technoshell Automations Pvt.

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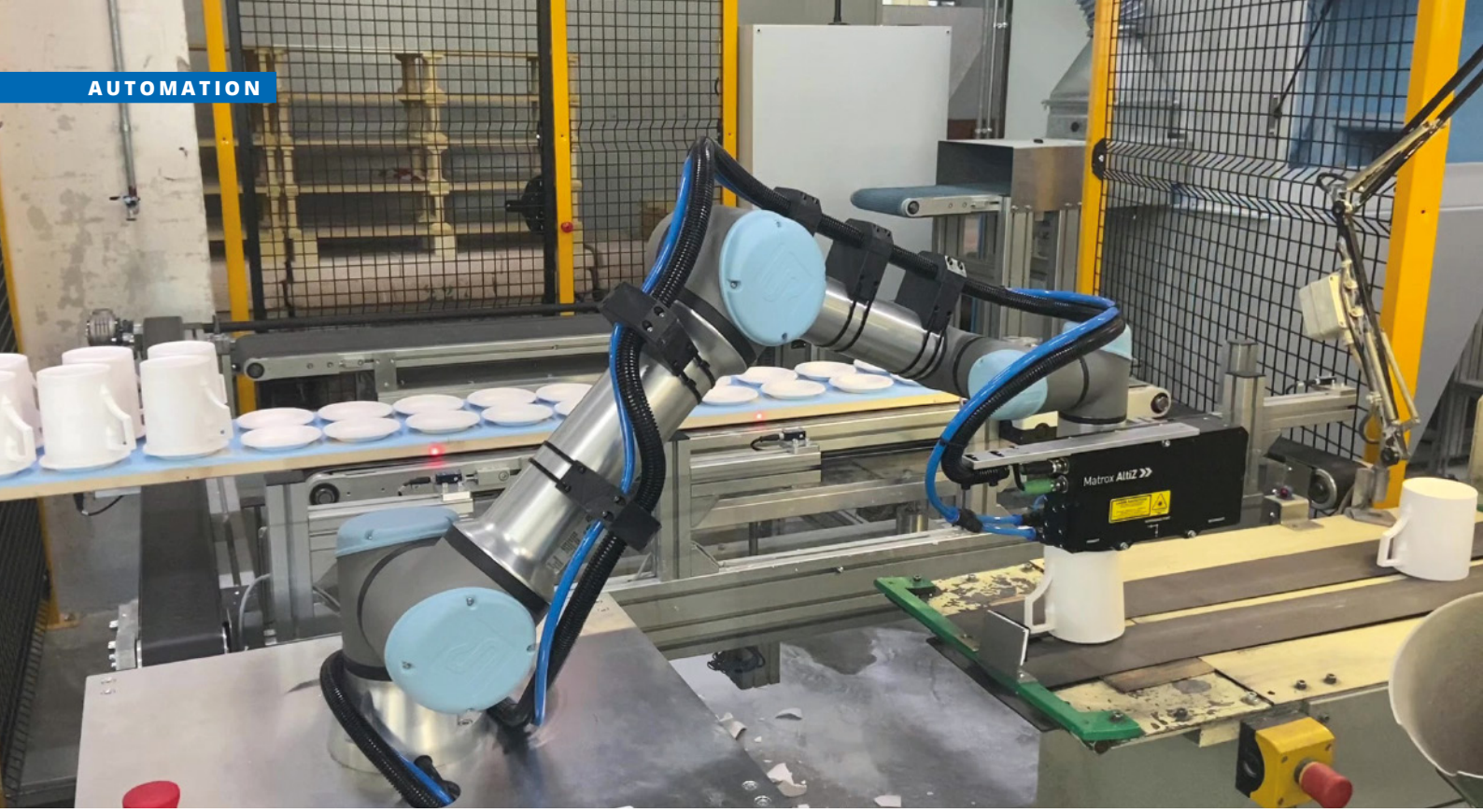


Rotation and positioning data from Matrox Design Assistant X software is communicated to the cobot, directing it to pick and place each teacup.

Cost Savings Through Automated Handling of Porcelain Tableware

3D-Based Robotic Pick-and-Place System

A cobot in combination with a 3D profile sensor and machine vision software has succeeded in saving 15 percent of production costs by automating the handling of luxury Italian porcelain teacups. This success is prompting the companies involved to consider further applications, for example in the food industry.

A luxury porcelain manufacturer based outside Florence, Italy has been a leader in handcrafted, elegantly designed tableware going back to the 18th century. Porcelain, otherwise referred to as fine china, it is renowned for its strength, durability, and pristine white color.

Yet, it is precisely that immaculate white color which poses numerous manufacturing challenges. For a robot arm to accurately locate raw white teacups on the production line and accurately place them in rows, a 2D vision system was not up to the task of distinguishing the different sizes, shapes, and positioning of the product. To overcome these challenges, this luxury manufacturer sought the expertise of Autech and Fortek, two Italian companies renowned for providing automation solutions, to help develop a vision-guided robot pick-and-place system that could locate teacups randomly placed by human operators. "Seeing the manufacturing process, we thought that the only way to solve this problem was through the use of a 3D-based vision system, and we found Matrox Imaging's vision systems and software perfect for this purpose," said software developer Marco Goracci, of Autech.

Vision Is Our Cup of Tea

The 3D vision system that Autech and Fortek designed comprises a Matrox Altiz 3D profile sensor connected to a Matrox 4Sight EV6 vision controller running Matrox Design Assistant X vision software. A collaborative robot (a "cobot") from Universal Robots completes the installation. The cobot is entirely vision guided; the software directs its movements and requires no operator interaction with either the cobot arm or the vision system.

The vision system performs three key tasks: scanning in 3D the raw white vessels; analyzing the 3D scans to establish the vessels' size, shape, and position; and communicating the results to the cobot so it can accurately reach the teacups as they move along the production line. A human operator placed the raw white teacups on the production line earlier in the process. "We needed a robust solution for a pick-and-place application. Matrox Imaging products were the best in term of ease of use, programmability, and price-to-quality ratio," noted Goracci.

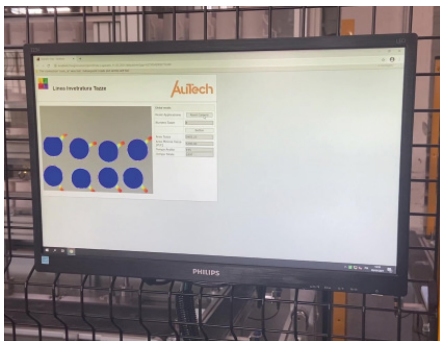
The profile sensor is connected to, and actually powered by, the vision controller through a Gigabit Ethernet cable. The sensor, mounted at the end of the cobot arm, moves above the vessels, performing a 3D scan of each teacup. The unique algorithms running inside the profile sensor automati-

All images: Matrox Imaging

Mounted on the cobot arm, the Matrox AltiZ 3D profile sensor provides high-resolution scans of the pristine white teacups.

cally generates reliable 3D data, by smartly selecting or combining the pixel data from the two integrated image sensors and outputting the 3D data through the GigE Vision interface.

The 3D data, in the form of a depth map, is used by Matrox Design Assistant X software to locate individual teacups by situating their unique coordinates on the plane and finding the handle position and degree of rotation of each cup. The vision algorithm begins by filtering the depth-map to remove unwanted areas and pixels. Blob Analysis is then applied to the filtered depth map; each teacup corresponds to a blob, which is used to calculate the highest height value using the Intensity Checker within the software. A combination of Metrology and Blob Analysis steps are used to precisely locate the position and rotation of the handle of each teacup. These coordinates are passed to the cobot using socket communication, allowing the robot arm to start its pick-and-place operations. The cobot then picks individual teacups and presents them to the appropriate glazing and decorating line.



Matrox Design Assistant X vision software provides easy-to-use steps for image acquisition and analysis, while also enabling users to design a graphical web-based operator view.

Lining It Up

The manufacturer produces teacups in a wide variety of shapes, sizes, and heights. Thanks to the flexible flowchart development within the vision software, the team at Autech was able to create a single project that addressed all possible product variations. This eliminated the need to implement and switch between different recipes and streamlined the deployment procedure. The vision system was brought online within one month with the involvement of a software engineer and a vision consultant. The major challenge concerned the variety of porcelain products to be analyzed by the application; with the help and support of Matrox Imaging's technical support team, engineers from both Autech and Fortek successfully fine-tuned the software analysis performed by the vision system. Implementation of the vision technology means a single-sourced vision system now allows the porcelain manufacturer to manage their entire production line.

"Our experience designing and deploying this project demonstrated how effective Matrox Imaging's products are for use in a vision-guided robot pick-and-place installation. We knew that a normal 2D vision system wouldn't suffice, and the 3D vision capabilities they afforded were ideal for our needs," said Goracci. "Our customers were very pleased with the outcome, so much so we are exploring plans to extend this application to other products they manufacture."

Conclusion

With a satisfied customer, the team at Autech is equally pleased with their experience developing this 3D vision system. It allowed them to consider new vision opportunities in fields not previously considered, including other potential applications in the food industry, and they anticipate developing similar vision systems for other customers in the future.

"Previously, the team at this luxury porcelain manufacturer required two operators to manage that production line," concluded Goracci. "With the introduction of the Matrox Imaging-based vision system, a single operator is now able to oversee the entire production process, which helped contribute to a 15 percent reduction in overall production costs – a clear success." ■

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Inline systems for the automated reading of codes with the help of fixed industrial scanners reduce personnel costs and create the conditions for 24/7 processes without fatigue.

Code readers, which are permanently mounted above control stations, allow a reliable code check on components in order to ensure correct assembly.

Fixed Industrial Scanners for the Optimal Material Flow

Improving Intralogistics Processes

With a family of stationary barcode readers, logistics specialist Zebra Technologies offers users powerful options for effective material flow. They reduce manual effort and make a significant contribution to ensuring that track-and-trace processes run smoothly.

The requirements for speed and accuracy in goods tracking have risen continuously in the past and required more and more performance from the code readers: Today, high reading rates and a minimization of incorrect or failed code readings are the basic prerequisites for precisely tracking objects.

In order to achieve the necessary effective profitability for companies, the trend has been towards fixed industrial scanners for some time, which reduce the manual effort for the employees to a minimum and thus contribute significantly to having all the necessary information available with the greatest possible security at all times. These permanently installed systems always present a particular challenge when the distances between reader and object often vary, for example due to different product sizes.

Diverse Tasks

Fixed industrial scanners offer effective solutions in numerous application scenarios. For example, they facilitate and accelerate the workflow when scanning codes manually, as employees only pass the goods under a overhead code reader, without having to pick up the reader themselves. In this way, objects of various dimensions with different code types can be handled easily, safely and quickly, regardless of the heights of the employees. Employees can use the time gained in this way for higher-value tasks.

If packed or unpacked goods are automatically guided through the processes on conveyor belts, fixed industrial scanners show their advantages even better. Inline systems of this type require considerably less personnel, and also create the conditions for 24/7 processes that can run around the clock without fatigue. Current practical tests show an improvement in reading rates in the range of up to 10 percent compared to manually performed reading processes and thus a significant increase in effectiveness. The combination of stationary barcode readers and conveyor belts, on which goods are passed for reading 1D and 2D codes, forms an excellent setup in many applications in production, quality control, packaging processes and the storage and retrieval of objects.

Applications where labels with information about the product or the production process are printed and attached during the process are another field where fixed industrial scanners show their strengths. With their help, it is possible to check very quickly, safely, and automatically whether the labels are present, correctly applied, of sufficient quality and whether the printed 1D and 2D codes are legible. Due to the early check, for example directly after the label has been printed, such systems reduce the manual effort and the error rate considerably and ensure trouble-free processes in the further process.

The final example of the economical use of fixed industrial scanners are assembly checks, which are often still carried out manually or with the help of more complex systems in many industrial areas. Code readers, which are permanently mounted above control stations, allow a reliable quality control check of codes on components in order to ensure that they are correctly assembled.

Wide Range of Fixed Industrial Scanners

Zebra Technologies is one of the world's leading providers of automation solutions for industry and recently expanded its range to include fixed industrial scanners. The innovative product family currently comprises four models:

- the compact plug & play device FS10 for simple track and trace applications without networking,
- the compact, networkable barcode reader FS20, which enables simple track and trace applications with network connection,
- the FS40 model, which, with its wide range of functions, is also designed for more complex track and trace applications, and
- the FS70 barcode reader, which can be fully adapted to the requirements of the respective application and is therefore suitable even for difficult track and trace applications.

A special feature of all fixed industrial scanners supplied by Zebra Technologies is that they are designed very flexible from the ground up that they can be easily adapted to changing business and customer requirements. Users therefore do not have to consider all possible future scenarios when designing their systems but can concentrate fully on the current tasks. If expansions are required at a later point in time, these can be carried out quickly and easily using appropriate upgrades. This flexibility leads to a maximum profitability of the purchased devices for users and gives them complete freedom as requirements grow.

The following example shows which advantages this offers: If only the pure recording of 1D and 2D barcodes is currently to be implemented in a system, a simple fixed industrial scanner such as an FS10 can be sufficient. If it becomes necessary later in this application to also record direct part markings or plain text, this task can be solved within a very short time by purchasing a corresponding software license. From an economic point of view, this results in optimized profitability for the user.

Uniform Software Platform

The cost for programming and setting up automation devices is often significantly higher than the cost for hardware. Anyone who can solve these tasks in a shorter time saves personnel costs and thus lowers the overall investment. With this in mind, Zebra Technologies has developed Aurora, a particularly simple and elegant solution for controlling the company-wide automation of production and logistics. This powerful software interface enables problem-free configuration, provision, and operation of all fixed industrial scanning devices in a company.

Aurora's intuitive and state-of-the-art user interface displays work processes in a logical way and allows users to make complex settings using sliders and option buttons with just one or two mouse clicks without having to search for the required functions. Even beginners can quickly find their way around the clear management platform as they are guided through all the necessary steps in the correct order. Should any questions arise during setup, the integrated help with easy-to-understand tutorials, precise instructions, and videos on all aspects of the software and the comprehensive administration tool set provide quick answers.

With its wide range of functions, Zebra's fixed industrial scanner family covers various applications.

In addition to fixed industrial scanners, Zebra Technologies has also developed smart cameras for industrial machine vision. This product family can also be easily managed via Aurora. Users who use both product groups in their systems benefit from faster familiarization, less training and a simple, uniform architecture of the software tools required to control their company-wide manufacturing and logistics solutions.

Wide Range of Applications

With its innovative fixed industrial scanners, Zebra Technologies primarily addresses warehouse and logistics applications, but also the manufacture of products of all kinds and many other industrial areas in which the effective, automated detection and reading of barcodes is an essential prerequisite for economic processes. The company uses its many years of experience in the field of barcode reading and transfers this to new target markets for its fixed industrial scanners and smart cameras. Users will definitely benefit from the increased efficiency. ■

Company in detail

Zebra Technologies

Zebra Technologies was founded in 1969 and has since developed into an international market leader in the areas of specialty printing and consumables, barcode scanning, mobile computers and robust tablets, RFID, and real-time location systems (RTLS), smart solutions for personnel management and smart automation systems. The company employs around 8,800 people in 130 branches in 54 countries, cooperates with over 10,000 sales partners and has already registered over 5,300 patents.

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Images: Zebra Technologies

AI-based recommendations help to identify errors both during commissioning and during the operation of a system

Bar Code Identification with AI

Artificial Intelligence Speeds Up Commissioning and Saves Money

Using artificial intelligence can be very worthwhile when it comes to identifying the bar codes on goods. Interfering factors can be identified quickly and easily both during commissioning of a system and during operation

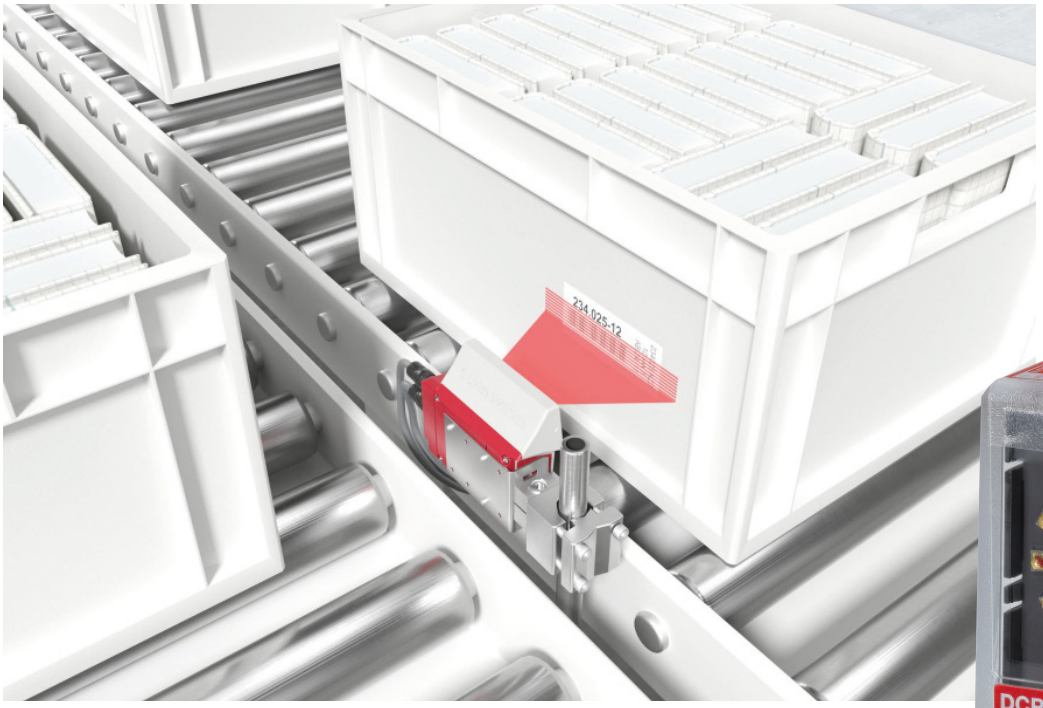
Bar code readers are sensors used to identify goods and materials in production or logistics. They do so by detecting bar codes that meet one of a number of standards and then supplying the IDs of the bar codes to a superior system. When using these devices in automated applications, the main objective is to achieve the highest possible reading quality: Essentially, when bar code readers detect the labels, the quality with which they perform this task varies – and this quality can be indicated as a percentage. The percentage relates to the contrast detected. If the value is below a certain threshold, the label is no longer read. One challenge faced by system operators is to find bar code readers as quickly as possible when they are no longer providing sufficient reading quality, and to determine the reasons for this. Without additional data regarding the possible sources of error this can be a time-consuming task. Particularly in large systems, for example in intralogistics that have up to 1,000 bar code readers and kilometer-long transport routes, the search is like looking for a needle in haystack: If in doubt, a technician must trace the entire route of a transport material in order to identify a poorly aligned sensor or the interfering factors in its direct environment, all while under time pressure. The situation is made worse by borderline cases, such as when the bar code reader is somewhat aligned and reads successfully most of the time, but occasionally does not detect labels. This may be because the bar code reader is slightly inclined or only reads in the border area, or other factors may play a role, for example labels of insufficient quality.

Factors that Influence Reading Quality

However, generating corresponding data to find the causes of errors using the bar code reader itself is only possible under certain circumstances. It is true that the sensors monitor their own status and transfer data to the superior system via OPC UA if required. However, this self-monitoring has only very limited functionality – a sensor only considers its own view. This means that it sends information such as "I am currently reading," "Excellent reading," or "Very poor reading" – i.e. its calculated percentage reading quality. The reason for the poor reading quality cannot be identified by the individual device.

Artificial Intelligence Provides the Context

There are three possible influential factors in this case: The device itself, the bar code label and interfering factors in the environment. Possible sources of error relating to the bar code reader itself include poor alignment to the labels to be detected or a technical fault. In turn, labels can be damaged, soiled or poorly printed, which, depending on the degree of damage or printing quality, may only reduce the reading quality or may prevent identification entirely. Interfering factors in the environment include vibrations, dust, and glare caused by sunlight or emitters in the background. Humidity, for example in cold stores, can be an interfering factor if this causes fogging on the scanning window of the bar code reader.



The recommendation algorithm rates a label as more or less "attractive" for different bar code readers so that users can easily find the best solution for their use case.

The DCR 200i series consists of camera-based 2D barcode readers.

Artifical intelligence can help to distinguish the various causes from one another and by doing so identify the reasons for interferences or poor reading quality. Leuze is working with an automobile manufacturer to develop a solution that enhances sensors with data from the overall context. The advantage of this is that the bar code readers remain operational as usual without additional work being generated for the customer during installation. The data volumes are large: Many labels pass by many bar code readers during the process and are read at various installation locations. This is where the overall context comes from. In mathematical terms, this overall context can be described as an equation with many unknowns – countless bar code readers, labels that crop up even more frequently and the various installation locations of the readers. At every station and for every label there is a different result in terms of reading quality percentage. AI solves this complicated equation system and answers the questions about whether a poor reading quality occurs always with a particular bar code reader, only with one label or a particular label type or always at a particular installation location.

Machine Learning via Recommendation Algorithms

To achieve this, Leuze uses recommendation algorithms, i. e. AI-based recommendation methods. These are the same methods that are used by streaming services, for example, to evaluate user behavior and recommend corresponding films or series based on this analysis. In this user behavior analogy, the bar codes correspond to the films and the bar code readers to the users of the streaming services. The recommendation algorithm rates a label as more or less "attractive" for different bar code readers. In this way, it is possible to determine which sensor or which label with a certain percentage is "unattractrive", i.e. borderline or noticeably problematic.

Per Edge Device or Cloud

In technical terms, an AI-based solution of this kind can be implemented via edge devices or a cloud, depending on the customer requirements and the respective system. An edge device is a separate device that is located in the vicinity of a sensor group and gathers, analyzes, and passes on the data of the sensor group. Multiple edge devices can be connected to one another. Since an edge device is capable of two-way communication – not just gathering and evaluating data but also sending the analysis back to the sensors – a bar code reader can also pass on this information and report that there is a problem. The advantage of this is that there is no need to make any changes to the customer's IT architecture. Alternatively, the solution can be operated via a cloud if data from separate locations is to be merged.

Significant Potential for Savings

Leuze's approach of using AI-based recommendations to identify errors offers clear advantages both during commissioning and during the operation of a system. Fast commissioning saves time and money. In this case, it is useful if the causes of poor reading quality are identified immediately. During operation, this method enables predictive maintenance. This means that if a shutdown will soon be required, system operators can take suitable measures in good time and, for example, manufacture and outsource in advance so that they can continue to supply their customers. In some cases, the data from multiple years can be used to facilitate this early detection. In addition, the system is learning continuously. Therefore, using artificial intelligence is always worthwhile when it comes to quickly and reliably identifying factors that interfere with the identification of bar codes on goods. ■

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All images: Leuze

Highly Dynamic 2-Axis Galvo Scanner

Aerotech has introduced the AGV-XPO. The highly dynamic, 2-axis laser scan head combines low-inertia, highly efficient motors with ultra-high-resolution position feedback and optimized structural dynamics. This enables high acceleration profiles and good path accuracy with a low following error at the same time. According to the manufacturer, it is therefore suitable for the production of complex components in microelectronics, medical technology and the automotive industry. Typical areas of application are high-speed drilling and cutting, within electronics manufacturing, for example in the processing and manufacture of displays, in laser processing with femtosecond lasers and in all other applications that require scanning with a large field of view and long focal length.

www.aerotech.com
Control Hall 5 Stand 5425

High Intensity and Basic Functions

Under the name Basic, Lumimax is presenting a new, High-Power LED lighting series for diverse machine vision applications. The focus on essential functions and the smart optomechanical design allow acquisition costs for this series to be optimised while maintaining high quality and reliability.

The lightings in the Basic series can be precisely switched synchronously with image acquisition thanks to digital, load-free SPS trigger inputs. The available light colours red, white and infrared enable numerous Machine Vision applications to be realised. With modern LED technology used in a highly efficient manner, the lightings reaches new intensity dimensions in its attractive price segment. Compact aluminium housings with highly flexible 3D cable outlets and a standardised Lumimax Basic connection concept allow the lightings to be easily integrated into industrial Machine Vision systems.

www.iimAG.de

Subminiature Blue Light Sensor for Detection Tasks

Sensopart presented the FT 10-BHD subminiature diffuse reflection sensor: With 150 mm on white/grey and 120 mm on black, it has a long range and offers an adjustable scanning range instead of the usual fixed focus optics as well as two switching outputs that can be set independently of one another.

With other sensors that have a second switching output, this is often used to detect a broken cable and is permanently set to non-equivalent. Although this option also exists with the FT 10-BHD, the second output can also be used differently – for example to specify a second switching window. In this way, not only can the presence of an object be determined, but also whether it is tilted to the detection plane. With two objects, the sensor can distinguish whether both are present or only one or none at all.

www.sensopart.com

Barcode Reader with Decoding Technology

Cognex introduces the Dataman 280 series fixed mount barcode readers, designed for a wide range of ID applications, including demanding 1D, 2D and Direct Part Mark (DPM) code applications in manufacturing and logistics .

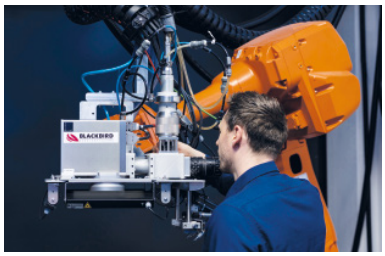
The barcode reader features a 1.6 megapixel sensor combined with a dynamic imaging system to improve code processing and coverage. The multi-core processor enables fast capture and decoding of the read codes. With this technology and the connectivity options even complex barcodes can be reliably read while overall equipment effectiveness (OEE) and throughput increase. Combined with Cognex Edge Intelligence (EI), the Dataman 280 offers features such as web browser connectivity, device management, performance monitoring and fast image downloads.

www.cognex.com

Autonomous Image Processing System

Inspekto has equipped its AI-controlled image processing system S70 with a new software system. This enables full control over quality assurance processes without users having to commission customized projects from external experts. The product is an Edge device that is immediately ready for use. S70 uses a combination of three AI modules. With artificial intelligence, the electro-optical system adjusts itself so that it automatically focuses and takes the best possible image of the object to be inspected. In this way, manufacturers can also reliably inspect demanding parts made of highly reflective materials such as metals or shiny plastics. The system is used by automobile manufacturers in Germany and has also spread to the electronics, plastics and metals industries. It is also suitable for the quality assurance of printed circuit boards (PCBs).

www.inspekto.com
Control Hall 3 Stand 3203

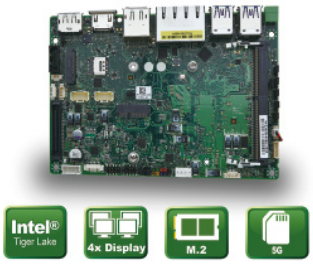


Scan Head with Beam Shaper for Fuel Cell Production

Scanlab develops new system concepts for laser applications such as laser welding of bipolar plates and additive manufacturing (metal 3D printing). By integrating specific beam shapers, a new system design has now shown the potential to almost double productivity when welding bipolar plates for hydrogen fuel cells.

For this purpose, a company has integrated Scanlab's Intelliscan 2D scan head in a test setup . The necessary beam shaping was determined with a process simulation. The design of the beam shaper used is the result of a combined optical design that combines diffractive optical elements (DOE) with a scanning system. The application tests made it possible to shift the speed limit for error-free welding from 45 to 70 m/min.

www.scanlab.de



Embedded Board for Energy-Saving Applications

ICP Germany launches the 3.5-inch PD11TGS embedded board. It comes standard with the Intel Core i3-1115G4E 2-core processor with a configurable Thermal Design Power (TDP) of 12 to 28 watts. The base processor clock reaches a maximum turbo clock of 3.9 GHz. Optionally, variants such as the Intel Celeron 6305E with 2 CPU cores, the Intel Core i5-1145G7E or the Intel Core i7-1185G7E with four CPU cores can be used. A DDR4 SO-DIMM socket enables all boards to use up to 32GB of non-ECC memory with a maximum clock frequency of 3,200 MHz. The Intel HD graphics unit of the 11th generation offers quadruple display support. Two HDMI ports with a resolution of up to 4,096x2,160 pixels, one display port with a maximum of 5,120x3,200 pixels and one LVDS connection with a Full HD 1920x1200 pixel resolution are available.

www. icp-germany.de

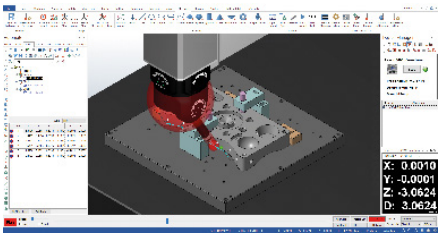
Four Times Faster Machine Vsion

B&R has increased the execution speed of a number of machine vision functions. With a new quad-core processor and just-in-time compiler, vision tasks run up to four times faster than before. Machine builders can use it to significantly increase the throughput of their machines – without using expensive vision PCs.

With the latest Steady version of the Halcon library, the B&R vision system now also has a just-in-time compiler (JIT). The program code to be executed is already created with the compiler when the application is loaded and not only interpreted at runtime.

In the case of multi-core vision algorithms, the advantages of the new smart sensor version with a quad-core processor also come into play. The higher computing power makes it possible, for example, to almost halve cycle times in matching applications.

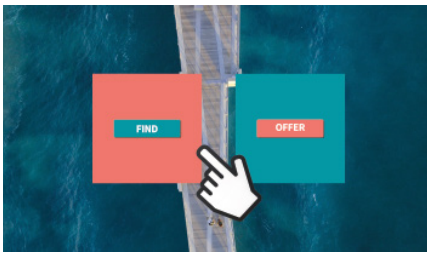
www.br-automation.com



2022 Version of Verisurf Published

Verisurf is presenting the 2022 version of its measurement software at Control (Hall 3 Stand 3314). As part of the 3D CAD platform, Verisurf uses model-based definition (MBD), where the CAD model serves as the design instance. This simplifies and automates test planning and enables improved process control. All manual and programmable CMMs are controlled via the Verisurf Device Interface (VDI). Verisurf's modular design enables users to quickly move from inspection to reverse engineering and tooling by efficiently capturing and processing contact measurement points or real-time non-contact scan data at a rate of more than two million points per second. The block segmentation of the point cloud data is then used for applications such as extraction, fitting, analysis and meshing.

www.verisurf.com
Control Hall 3 Stand 3314



Online Marketplace for Machine Vision with and without AI

IDS has opened the online marketplace Visionpier. There you can look for providers for specific tasks or already existing in-house developments.

Providers present their solutions for machine vision tasks there. B2B customers can compare these and get in touch with one click. If he does not find what he is looking for right away, the customer can submit an inquiry to the marketplace. SMEs in particular can secure competitive advantages in this way. The supplier side saves development time through synergy effects.

www.ids-imaging.de

Edge Computer for Demanding Machine Vision

With a bandwidth of up to 20 Gb/s, Gidel's new embedded computer has been developed for demanding image processing applications. It combines an NVIDIA Jetson Xavier NX processor with Gidel's powerful frame grabber technology for real-time acquisition and processing of large amounts of image data.

With two 10GigE and two Camera Link 80-bit (DECA) connections, Fantovision 20 has high-bandwidth camera interfaces and is therefore suitable for high-resolution, high-frame-rate applications and multi-camera systems.

The ultra-compact computer combines an Nvidia Jetson Xavier NX System on Module (SOM) for image processing and AI algorithms with an Intel Arria 10 FPGA with Gidel's powerful image acquisition, processing and compression.

www.gidel.com

Integrated Smart Vision System

NET has introduced an integrated smart vision system. Due to Xilinx's system-on-chip design with CPU and FPGA on one chip, high and efficient system performance is achieved. With the Xilinx Vitis software tools, users can use the FPGA resources for powerful neural networks as well as for conventional image processing in real time.

NET's Open Camera Concept also enables commercial image processing libraries such as Halcon, MIL or Adaptive Vision to be used, as well as Open CV or other open source software tools. Several configuration options are available: image sensors, system performance with different FPGA sizes, OEM systems for customer-specific adaptations, various interface options for system integration.

www.net-gmbh.com

Glass fiber defects highlighted by Smartview

Inspection Systems for Glass Fiber Production Processes

Web Inspection and Monitoring Platform Determines the Cause of Glass Fiber Production Defects

A special type of synthetic fiber, glass fiber is also known as fiber glass, and is a material consisting of numerous, extremely fine fibers of glass. Its growing use in nonwoven applications has increased the need for accurate, automated inspection.

The strength and versatility of glass as a fiber makes it unique as an industrial textile material. Nonwoven end products based on glass fibers have a huge market and can be found almost everywhere – in ceiling tiles, cushion vinyl flooring, insulation, wallpapers, and surfaces, geotextiles, batteries, and of course roofing materials, as well as in many other applications.

Vast Variety of Features and Applications

Glass fiber, as a basic component, is an excellent composite material and offers numerous advantages that give their esulting products unique properties. These nonwovens are known for excellent thermal insulation, high tensile strength, and extreme moisture repellency.

Glass fibers exhibit useful bulk properties such as hardness, transparency, resistance to chemical attack, stability, and inertness, as well as desirable fiber properties such as strength, flexibility, and stiffness. They are used in the manufacture of structural composites, printed circuit boards, and a wide range of special-purpose products. Some of the most common applications for glass fiber nonwovens include infrastructure, buildings and construction, pipes and tanks, transportation, consumer goods, oil and gas, chemical, industrial and corrosion.

Determining Defects

Many filter media are fibrous in nature, and their properties depend on media thickness, fiber diameter, fiber orientation, and pore size distributions. One major purpose in the inspection of glass fibers is to find defects and/or formation weaknesses that will cause degradation of strength or filtration of the material shipped to the end customer. A further reason is to understand the web forming process better, particular-

ly when and why defects appear. This root cause analysis is moving more and more to become the focus.

Glass Fiber Mats Based on Wetlaid

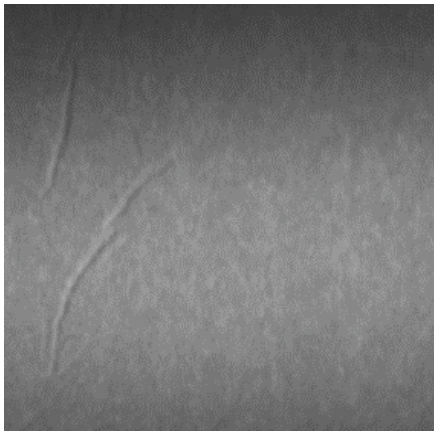
Glass fiber mats can be used for a very wide range of applications, and this is a growing market. Different types of lines are available – from small to large capacities. To ensure good web formation and a lower consumption of expensive chemicals, it is important to give the fibers enough room to move freely by applying sufficient turbulence to the water-fiber suspension, and to lay the fibers with the best fiber orientation, making sure that they are well distributed.

The volume of wetlaid nonwovens materials for construction interiors is continuing to develop. Yet, it is not only the volume of these materials that is growing but also the demand for high-quality materials.

More and more buildings and houses are being built and rebuilt worldwide. This results in an increasing demand for construction materials. Manufacturers are developing products that are easier and quicker to apply and require less post-treatment than plasterwork or paintwork.

Finding the Perfect Fiber Distribution

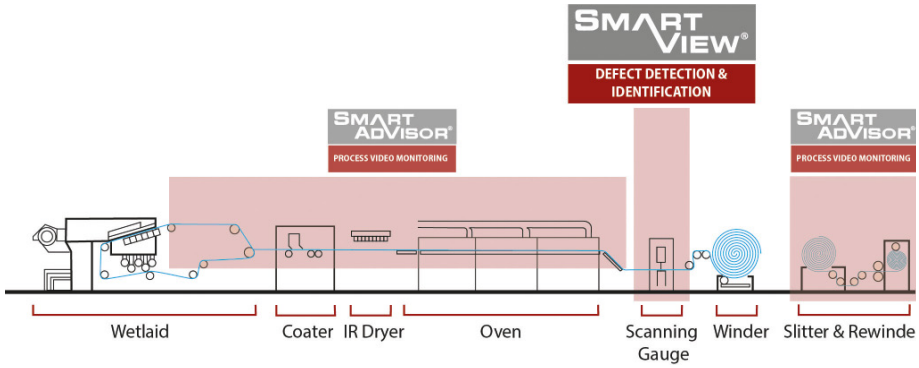
An important part of these developments is based on wetlaid nonwovens glass fiber material. For example, the paper and cardboard materials used as facers and backing material on gypsum board dry-wall and polyiso roofing panels are now being replaced by coated glass fiber veils. Increasingly, glass fiber veil is used in applications where aesthetics is very



Smartadvisor video captured of the formation of wrinkles before the dryer section

important, such as ceiling tiles and wallpaper. The more traditional applications, where aesthetics are less demanding for glass fiber veil – such as reinforcement material for vinyl flooring, carpets and bituminous roofing – require flatter materials with higher tensile strength.

All images: Ametek



Locations of Smartadvisor and Smartview cameras and lights on a process line

Glass fiber veil is also used as a filtration material, and for battery separators. Good distribution of the glass fibers is essential in these applications. These developments require glass fiber producers to improve the properties of their products.

A homogeneous mat with perfect fiber distribution is needed more than ever to meet the end-user requirements. The market expects products with perfect fiber formation – this is where Ametek Surface Vision's Smartview inspection system comes in, as it will document the web quality.

Inspection Systems for Glass Fiber Production Processes

To inspect glass fiber processes, Ametek Surface Vision uses its Smartview web inspection and Smartadvisor web monitoring products together in a unified platform called Smartsync. This total vision integration combines the power of advanced Smartview classification with the flexible, multi-position camera technology of Smartadvisor. As a result, the operator can rapidly determine the root cause of any defects and take the necessary corrective action. An integrated fault map provides an accurate process quality overview, while classified defects are synchronized with the associated video files from upstream cameras. An integrated database provides comprehensive reporting for all visual anomalies.

Integrated database for reporting of all visual anomalies

The Smartview system uses multiple cameras and lights arranged on glass fiber production processes. This can range from an optimized optical arrangement to selecting the suitable light to highlight topographical (3D) defects like wrinkles or contamination, missing binder, or any other damage of the web.

To round up the application requirement, patented air knives are used to reduce the maintenance work, while special cooling components embedded in the mechanical design allow the system to be installed close to the dryer section.

Web Monitoring for Capturing and Storing Sheet Breaks

Smartadvisor's web monitoring technology provides the capability to capture and store sheet breaks and corresponding sheet defects, from root cause to failure. Images from multiple camera locations are automatically synchronized to a continuous flat sheet process, such as those in the paper, plastics, nonwovens, and metals industries. This multi-camera synchronized view ensures that the cameras automatically synchronize to web speed and location, so that current and historical images are presented seamlessly. Smartadvisor allows direct scan-back from live video, with up to 72 hours of recorded history, for easy and clear identification of upset root causes.

Conclusion

The growing use of glass fiber in a wide variety of nonwoven applications across many industries has increased the need for accurate, automated inspection. This high-quality inspection can be provided by a combination of Ametek Surface Vision's Smartview and Smartadvisor products, which together provide defect detection and identify the root cause of those defects.

An automated system supports high-speed production, so there is no loss in productivity while inspection takes place, while the level of detail inspected is far greater than that of the naked eye. By using an automated inspection system, manufacturers of glass fiber nonwoven materials can assure their product quality, maximize yields, and significantly reduce customer complaints. ■

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Thermal Imaging Videoscope Family with Two Additional Kits

Teledyne Flir introduces two additions to the VS290 thermal and visual industrial videoscope family – the VS290-33 thermal videoscope kit with MSX and the VS290-21 thermal videoscope kit. The VS290-33 features a rounded dual probe (visual/infrared) for greater flexibility when inspecting underground voids and other high voltage scenarios that require a CAT IV rating. The VS290-21 enables construction and maintenance professionals to perform thermal-only inspection (no visual camera image) of buildings, mechanical and electrical systems in hard-to-reach areas, from crawl spaces to the heart of engines.

With the launch of the VS290 Videoscope Kits, Teledyne The VSC- IR33 and VSC-IR21 probe heads are also available as accessories for existing VS290 customers who already own the VS290 kit with the original VSC-IR32 square-tipped probe. **www.flir.de**

Digital Microscope in 4K Resolution

Vision Engineering has introduced a new digital microscope. The Makrolite 4K is ideal for professional digital image acquisition, inspection, measurement and archiving. It features 4K image resolution suitable for a variety of complex and high-contrast applications.

Makrolite 4K is a powerful imaging solution intended for use in demanding inspection routines. According to the manufacturer, the digital microscope, which can be operated intuitively, delivers high-resolution video images. The large dynamic range and a magnification of up to 330x ensure consistent image acquisition and further processing. Errors and rejects in samples and components, production or processing errors, preparation or manipulation inconsistencies, etc. quickly catch the eye.

www.visioneng.de
Control Halle 7 Stand 7412

Inexpensive High-Performance Computed Tomography

With the Tomoscope XS FOV 500 from Werth Messtechnik, high-performance computed tomography is now available at the price of conventional 3D coordinate measuring machines. The maintenance-free X-ray tube in monoblock design has a voltage of 160 kV and delivers fast measurement results with an output of 500 W. The device comes with a two-year warranty on the X-ray tube without any shift limits and also enables in-line or in-line measurements thanks to on-the-fly operation and real-time reconstruction. It can be automated and integrated using robot loading and interfaces to most software solutions, and the basic configuration without moving measuring axes is suitable for workpieces up to a size of approx. 200 mm.

www.werth.de
Control Hall 7 Stand 7101

Compact and Robust X-Ray System

At this year's Control, Yxlon will be presenting a new UX20 X-ray system live. It is primarily designed for use in harsh environments such as foundries, but also offers all the advantages for laboratory use. The large test room ensures that the system is extremely flexible and can be used for a wide variety of test parts and applications. Like all modern Yxlon systems, it is controlled via the Geminy software platform, which enables easy operation without special prior knowledge. The direct change between DR and CT within a test sequence enables targeted test processes.

Optionally equipped with the new 225kV MesoFocus tube, a new resolution and power range is offered that closes the gap between mini and microfocus tubes, making the system ideal for both large and small parts.

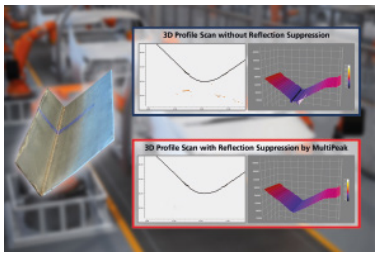
www.yxlon.de
Control Hall 7A Booth 7A-515

Measurement Software with a New Look

Optisense has given the measurement software OS Manager a completely new interface. The operation is now based on established Microsoft Windows and Office standards and thus enables an intuitive entry into computer-aided measurement technology.

With the OS Manager, measurement data, for example at the end of a shift, can be transferred to the PC in order to archive them. The measurement data is thus securely and permanently documented – and one of the main requirements of modern coating companies is thus met. In addition, calibrations are organized in no time at all. In this way, users can easily create a new application for combinations of coating and substrate.

www.optisense.com



Interference-Free 3D Scans via Laser Triangulation

The 3D scanners CX4090HS of the C6 series from Automation Technology now enable interference-free recording of 3D profile data. Multipeak is the name of this new function.

With Multipeak, highly reflective materials such as metal, plastic or glass can be scanned without interfering reflections. If there are several reflections of the laser on the test surface, the function helps to differentiate between them and output up to four profiles with peak data separately. In this way, multiple laser reflections can be easily checked for plausibility on the application side and, if necessary, eliminated as disturbance variables from the evaluation data. The big advantage: The user receives a clean profile evaluation and can thus improve his quality control. In the automotive industry, for example, Multipeak is used to inspect weld seams on V-shaped sheet steel.

www.automationtechnology.de

Test and Inspection Systems with Artificial Intelligence

Atecare presented some new products at Productronica 2021, which are available now. These range from inline inspection solutions and microscopes that can be used manually to AI solutions that can also be used outside of the electronics industry. For example, Omron's VP9000 3D SPI system, which was developed for solder paste inspection . In this way, the operator can divide the resolution supplied by the system, including the field of view (FOV), into thirds if required, so that even fine structures can be reliably inspected with the same machine. This is also possible with high throughput. The VP9000 uses a 3D process to record and measure the screen printing volume. A dirt inspection function is also available.

www.atecare.de

X-Ray Inspection System for Special Tasks

Ishida launches the IX-G2-F X-ray inspection system. The device works with dual energy technology. Users benefit from high detection performance and can also find low-density foreign bodies that are difficult to detect, such as bones in poultry meat.

The X-ray inspection system uses two energetically different radiation sources. The signals with high or low energy are recorded by line sensors and then compared. This creates an overall picture with a clear contrast between the product and low-density foreign bodies. Background effects caused by the product are eliminated and detection is improved. Ishida has equipped the system with new line sensors that enable an even better X-ray image and thus increase the detection performance fourfold compared to previous models.

www.ishidaeurope.com

Mini Raman Spectrometer Especially for Non-Polar Substances

Hamamatsu's C15471 is a mini Raman spectrometer module with a laser diode that offers 50 mW of power. The triple performance compared to the previous model enables more precise measurement results at lower concentrations of Raman-active molecules, especially non-polar substances. It also works in a broader wavelength range, which now also includes substances such as wax, fats or fragrances or flavorings dissolved in alcohol. In addition, the Raman spectrometer can also be used without a sample holder for open-path measurements, for example when investigating outdoor soil conditions. In addition to the optics, Hamamatsu supplies free evaluation software with its latest Raman spectrometer.

www.hamamatsu.com

3D Scanner with High Precision

Artec 3D has introduced the 2022 Artec Leo 3D Scanner, a completely wireless handheld 3D scanner with an integrated touchscreen. The new Jetson TX2 processor from Nvidia is integrated in the device . This is more than twice as powerful as its predecessor and consumes less than 7.5 watts of electricity. In addition, it is equipped with an optimized multi-core processor. The optimized version of Artec Leo also offers a revised 3D scanning workflow, with a new user interface and an even more user-friendly screen.

A calibration set has also been introduced for the new version. With it, users can check the accuracy of the scanner and adjust its parameters. Since the operating conditions can vary greatly, this accessory allows users to regularly test the device and fine-tune it for the specific environment.

www.artec3d.com

Artificial Intelligence Inspection System

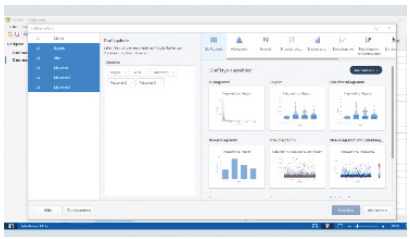
With the VT-S10 3D-AOI inspection system, Omron offers an imaging process in combination with artificial intelligence. The system can be used to automate high-precision assembly inspection processes, thereby reducing the need for specialized machine operators. Equipped with Omron's proprietary multi-direction, multi-color imaging technology (MDMC), the VT-S10 series automatically optimizes illumination angles, colors and light intensity during assembly inspection. It makes it possible to capture solder joints more precisely than with conventional imaging methods and to eliminate the interference caused by shadows from neighboring high components. Features such as the shape of the electronic components and the soldering points on the circuit board are taken into account.

inspection.omron.eu

Tactile and Optical Measurement Technology for the Automotive Industry

At this year's Control, Klingelnberg is presenting, among other things, the P 40, a measuring system that combines tactile and optical measuring technology. An optical sensor system specially developed for gear measurement and the quick changeover between the tactile 3D-Nanoscan probe system and the Hispeed optical sensor Optoscan enable flexible, fast and highly accurate. Measured value recording under all conditions. With the current version of this option, it is possible to measure pitch, tooth thickness and gear concentricity on spur gears optically. As a result, the number of measurements for production-related quality control per shift and machine can be increased by an average of 20 percent. The attractiveness of the option increases with the number of teeth in the gearing to be tested. **www.klingelnberg.com**

Control Hall 6 Stand 6307



Version 21.1 of a Statistics Software

Minitab has released version 21.1 of its Statistical Software. The hybrid application, consisting of Minitab desktop for installation on the PC and the Minitab Web App with access via the cloud, is suitable for beginners and advanced users and comes with a range of statistical methods and graphic tools.

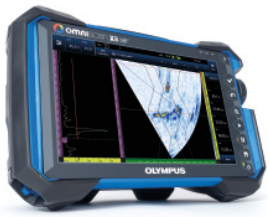
For example, the latest version includes the interactive "Graph creation" module, which is useful for visualizing data. A gallery previews the available chart alternatives, which you can seamlessly switch between. This allows users to view and try out the graphics based on one and the same data without having to carry out the analysis again. With these features, the user can focus on choosing the chart type that best suits their data and results. The selected graphic can then be adjusted further.

www.additive-net.de
Control Hall 8 Stand 8408

Miniature Hexapod Positioning System with Six Degrees of Freedom

Aerotech's HEX150-140HL will be on display live for the first time at Control in Stuttgart. It is a miniature hexapod positioning system with six degrees of freedom (DOF) that enables precise translation in the X, Y, and Z directions and rotation about each of these axes. It is ideal for space-constrained multi-DOF applications that require fine positioning resolution, such as photonics alignment, assembly and interconnection, optics inspection and alignment, optical wafer probing, aerospace and satellite sensor testing and sample alignment in synchrotron and beamline applications. Other important features are the high load capacity of up to 7.5 kg with a blocking force of up to 100 N, the large range of motion for easy integration into complex applications, and simple control and programming with virtual pivot point adjustment.

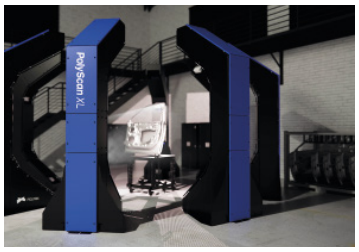
www.aerotech.com
Control Hall 5 Stand 5506



Test Device with 64 Channels

The 64-channel Omniscan X3 tester brings enhanced features and performance to Olympus' field-proven phased array testers. The device has the pulser capacity and the ability to drive up to 64 probe elements simultaneously, increasing the data acquisition speed for TFM (Total Focusing Method) imaging. These expanded capacities can be used to expand and diversify the application portfolio. It can process TFM images 4x as fast as its predecessor and comes in the same rugged case. Thanks to the onboard memory of 1 TB, inspectors can also work longer on site and carry out more extensive inspection jobs without transferring data. To facilitate inspection of complex and thicker test parts or welding applications, the instrument's full 64-element aperture with PA and 128-element aperture with TFM allows optimization of advanced Dual Linear Array (DLA) and Dual Matrix Array (DMA) sensors.

www.olympus.de
Control Hall 6 Stand 6302



Surround 3D Scanner

At the Control, Polyrix will put the Surround 3D scanner PolyScan at the center of the trade fair appearance. These are motionless, multi-sensory 3D measuring systems. They enable a complete three-dimensional recording of components. According to a spokesman for the company, the measuring system is primarily suitable for dimensional inspection, in-process quality assurance and the control of components, tools and models.

The Polyscan X Series Surround 3D scanner range includes a variety of sizes and configurations. This ensures complete component detection – from the smallest turbine blade to complete vehicles – with just one scan. All models have in common the modular column design, the vibration isolation as well as the 2+ cameras and 2+ projectors.

www.polyrix.com
Control Hall 4 Stand 4203

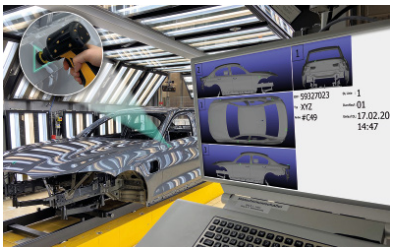
Cameras with a Detached Sensor Head

After the successful introduction of the Sony Pregius S sensors in the XIC and XIX camera series, these series were expanded to include a further developed housing model in which the sensor housing could be spatially separated from the camera electronics: cameras with a detached sensor head.

With this structure, the full sensor specifications of the Pregius S sensors are achieved without having to enlarge the cameras. In addition, the separation of the sensor head has decisive advantages for the image quality due to the spatial separation.

After the Pregius S sensors, Ximea also offers the new housing concept with larger sensors such as Sony's IMX411 with 151 Mpix, the IMX 455 with 61 Mpix and the IMX461 with 101 Mpix.

www.ximea.com



Projection Solution for Dynamic Tool Tracking

To further optimize processes in quality assurance, Extend 3D customers can expand the projective display solution with dynamic tool tracking. The solution projects positions for assembly or reworking directly onto the component with a colored reference. The worker can then process this with his tool. If he has revised a position, the system automatically switches to the next processing step. At the same time, it records important process parameters such as the processing time.

The tool tracking expands the AR system for dynamic laser and video projection from Extend3D – both systems mesh seamlessly and ensure 100 percent processing. The projection shows exactly where the worker has to start on the component, and the tool tracking documents the revision.

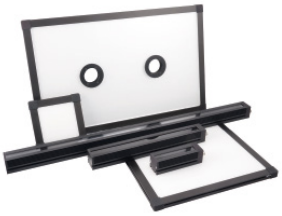
www.extend3d.com
Control Hall 5 Stand 5216

Highlights of Industrial Computed Tomography

Waygate Technologies will be present at Control. At booth 3404 in hall 3, the company will be presenting its premium products from the fields of industrial radiography and computed tomography (CT) as well as visual inspection and ultrasonic testing.

This year's exhibition focus is on the micro-CT system Phoenix V tome x M. The industry-leading system is characterized by the company's own scattered radiation reduction tool Scatter correct and enables high-precision 3D measurement technology and analysis. In addition to the V tome x M, Waygate Technologies will be presenting X-ray and CT inspection solutions for the electronics and battery industry, including a new system for inline inspection with micro-CT, which trade fair guests will be able to see on site for the first time using augmented reality/mixed reality technology (AR/MR).

www.waygate-tech.com
Control Hall 3 Stand 3404



Flexible Lighting for Machine Vision

With the MBJ-Flex series specially designed for machine vision applications, lighting can be adapted to almost any application. Customers can choose from bar, incident or transmitted light illumination and change the sizes individually in 100mm increments. The size can be selected up to a maximum size of 800 x 1,000 mm for the incident/transmitted light illuminations and up to a length of 1,600 mm for the bar illuminations.

The reflected and transmitted light illumination offers a very homogeneous radiation over the entire surface due to the lateral coupling of the LED light. Users can choose from the LED colors white, red and infrared for all lighting in the Flex series.

For the flex bar, MBJ also offers optical foils or lenses to change the light characteristics. Due to the structure of the lighting, it can also be changed or adjusted afterwards.

www.mbj-imaging.com
Control Hall 8 Stand 8407

Positioning System for Cameras, Lighting and Sensors

At Control 2022, DK Fixiersysteme is showing a whole range of new developments. Among other things, the company plans to present a variable positioning system for cameras, lighting and sensors. The test parts are not fixed, but the cameras, lighting and sensors are positioned, aligned and permanently held securely.

The DK "joint systems" program includes five separate programs of 3D flexible clamping joints for all requirements when positioning machine vision components. Among other things, there is the Strongline, which is for simple applications such as positioning the lighting, Varioline for greater stability for demanding holding tasks, and Turnstopline, which holds as if welded after locking the central joint manually without tools.

www.dk-fixiersysteme.de
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