VOLUME 10
DEZEMBER 2009

12

D 30 122 F

VISION ▸ AUTOMATION ▸ CONTROL

INSPECT

BuyersGuide 2010

- Comprehensive Supplier Presentation
- Detailed Company Profiles
- Regional Distribution of Vendors
- International Machine Vision Standards

PARTNER OF:
VISION
AUTOMATICA
Control
emva
european machine vision association

GIT VERLAG
A Wiley Company
www.inspect-online.com

real easy

The Chameleon™ USB 2.0 camera: an easy choice for real imaging

Imagine a camera with an exceptionally sensitive **1.3 MP Sony® CCD** and easy-to-use **USB 2.0** interface that can connect to almost any system. Then, picture it controlled by an **FPGA** and housed in a compact and lightweight case with **GPIO for trigger and strobe.** Now, see the Chameleon, making easy imaging a reality for just **USD $375.**

POINT GREY

Innovation in Imaging

Join the pack at www.ptgrey.com/realeasy

Global Sourcing

Global Sourcing is no longer the prerogative of companies improving their bottom line; global sourcing long since reached the consumer. The new blockbuster on DVD not yet released in Europe, I can easily get from amazon.com in the US. Drugs – the legal kind, sort of – not sold in Germany can be obtained from a company in the Netherlands. Or even more amazing: my personal assistant for getting me a table at my favorite Sushi restaurant in Frankfurt, for organizing the concert tickets for New Years Eve in Vienna and for doing some online research for my next presentation, works out of India, and speaks German and English fluently.

Distances between customer and supplier do not necessarily present a barrier any longer, as long as the information is available where to get what in which quality for how much.

Admittedly, this is not quite the same for the global sourcing of a company. More is at stake here when quality criteria are not being met. Therefore importing goods from global suppliers by the same token is exporting quality standards to these suppliers. Thus an increasing demand for automation of quality assurance measures can be witnessed, globally. Beneficiaries of this trend are machine builders and, more specifically, suppliers of machine vision and optical metrology. These products and technologies make sure that quality expectations can be met in the same way and according to the same criteria in Kyiv, Geneva, Karachi and Nairobi. The products provided by our industry enable the success of global sourcing strategies by making sure that the agreed upon specifications are adhered to.

For the providers of machine vision or optical metrology the ability to deliver and service internationally is one of the major success factors. Since a lot of the companies from these industries are SMEs, however, the international marketing is not always that easy.

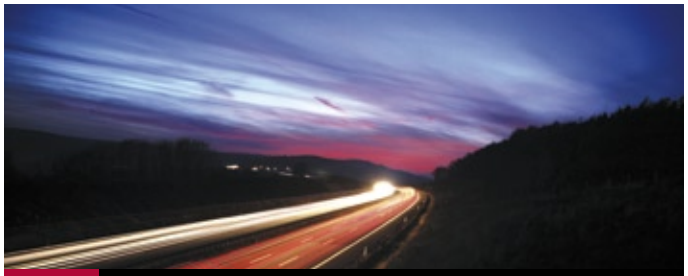
The INSPECT Buyers Guide provides one instrument to deliver the information about suppliers, products and services in the fields of quality and yield improvement right to your desk. The more than 750 companies on the following 100 pages can provide the booster for your global success.

Gabriele Jansen
Publishing Director

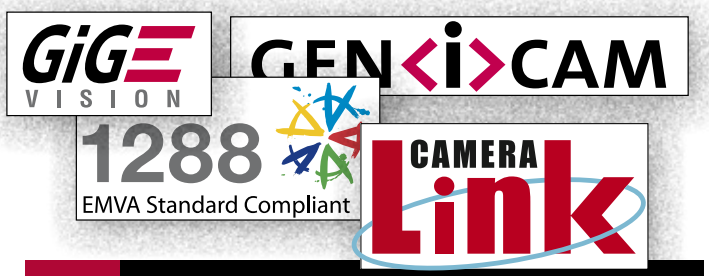
TOPICS

STANDARDS

Future Trends in 3D ▶ 008



Camera Roadmap ▶ 014



International Standards ▶ 018

BUYERS GUIDE

Get more vision

DALSA Genie GigE cameras are compact, rugged and specifically designed and priced to fit your application and budget.

Genie

- Active Resolution from 640 x 480 to 1600 x 1400
- Frame Rates of up to 300 fps
- Monochrome or Color
- Simplified setup with Sapera Essential software
- Industrial RJ-45 Connector

Capture the power of DALSA

Download product specifications and white paper: “Making the Move to Digital Image Capture”
www.dalsa.com/genie/ins12

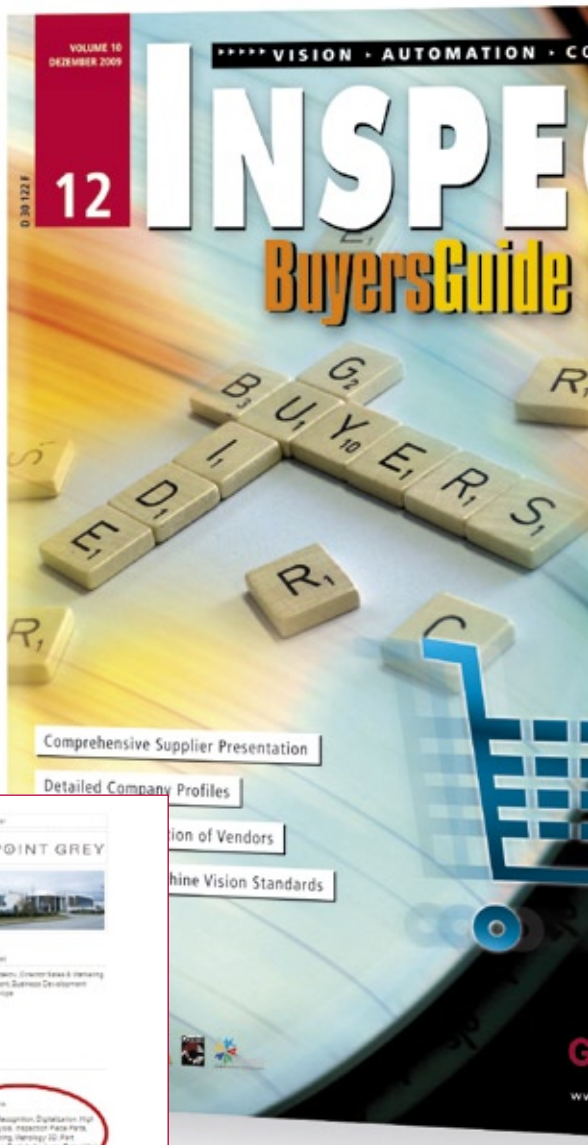
Genie™ cameras are fully compatible with DALSA’s Sapera Essential Vision Software.
www.dalsa.com/mv

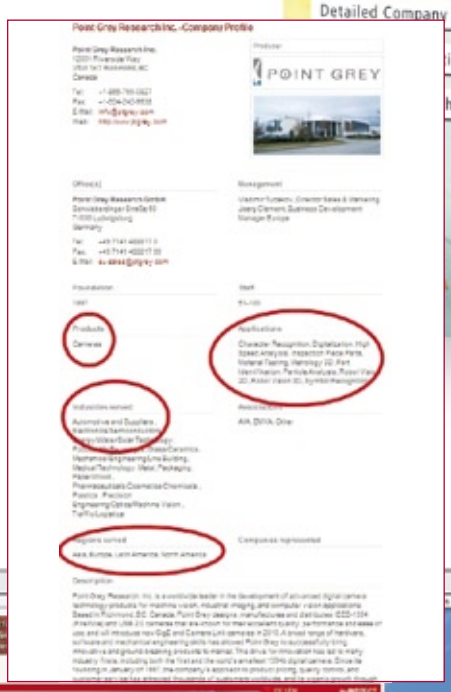
DALSA

Cross-media,
Comprehensive and Concise

The INSPECT Buyers Guide 2010

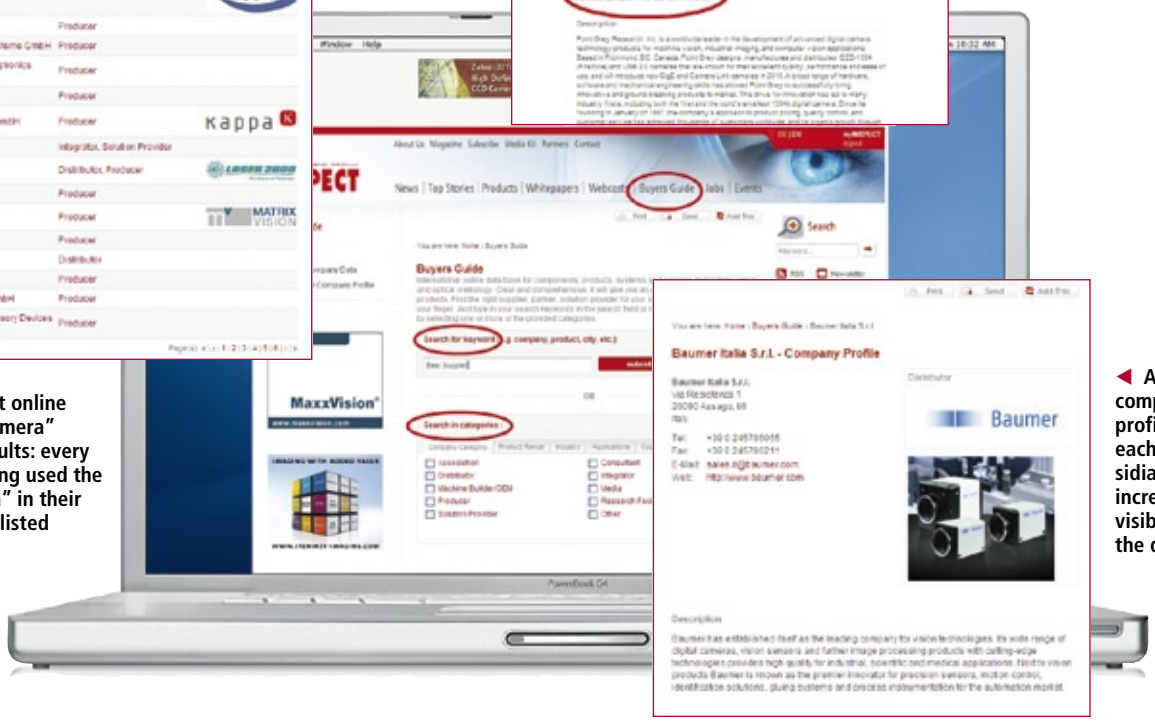
Throughout the year, we aim to provide you with information about new developments, technological trends, groundbreaking applications, new products and leading companies. Throughout the year we are faced with the recurring challenge: What to select, what to highlight, what to point out. There is never enough room to cover it all. So once a year we seize the opportunity to present to you a comprehensive overview of the machine vision and optical metrology industries.





◀ Companies providing a full-fledged company profile will be additionally found in multiple categories with the keyword search

▲ The full text online search for "camera" yields 107 results: every company having used the word "camera" in their description is listed



◀ A short company profile for each subsidiary increases the visibility in the data base

The INSPECT Buyers Guide is published in its second year now, this year for the first time in close cooperation with the EMVA, the European Machine Vision Association. The guide contains information about close to 750 companies from 35 countries. The INSPECT Buyers Guide has a clear focus on companies doing business in Europe or exporting their goods to Europe. Naturally this comprehends companies and organizations from all over the world.

Online....

In the ongoing (and probably not any time soon ending) discussion about print versus online, we decided that for a Buyers Guide both is best. Thus the INSPECT Buyers Guide is a true cross-media product. At www.inspect-online.com/buyers-guide the online database provides sophisticated search functions for all listed companies. Every entry can be searched for with full-text search, and every listed company will be found here according to the short description they have provided themselves. Additionally, every listed company will be found by name, company category (e.g. producer, integrator, research facility, association, etc.) and country of headquarters.

Companies wanting to provide more information and aiming at even better search results are listed with a company profile, including detailed company data and a listing of products offered, industries served and applications catered to. These, and only these, companies will be found in the respective search categories.

The online Buyers Guide is open for companies within the scope of the INSPECT all year round. In this way it is always up-to-date.

... and Print

The availability of data online is a clear benefit when presented with clever search functions. However, sometimes you do not want to bother going online, or you don't want to search specifically but rather obtain a quick overview. In these instances a printed version has its unchallenged advantages. Not to mention the ease-of-use when taking notes right next to the provided data. Thus, once a year in December, the INSPECT Buyers Guide printed edition is provided to you. With this guide we strive to give you a full overview that is still easy-to-use, a complete set of information that is still not too sub-divided into too many categories. The INSPECT Buyers Guide 2010 is divided into three main chapters: Topics of long-term impact, company profiles for the main global regions, and company listings for the main product categories.

Topics with Impact

As topics of long term impact, we have a focus this year on machine vision standards. You will find features about EMVA 1288, GigE Vision, Gen<i>Cam, Camera Link, Lens Mount and a proposal for a standardized software benchmark. In addition we exclusively present to you some of the results of the annual camera technology study the INSPECT has conducted in close cooperation with Framos Imaging Solutions. The editorial section is rounded off with some of the highlights from our panel discussion "All you ever wanted to know about 3D", hosted at the Vision trade show in Stuttgart early November of this year.

Company Profiles

In the company profiles section you will find all companies listed in the Online INSPECT Buyers Guide at the date of publication of this printed edition. The companies are presented with the profiles they themselves provided for the data base. To allow for a faster overview the world is "broken down" into the regions of the German speaking countries (Germany, Austria, Switzerland) where a large cluster of vision and optics companies are located, Europe, North America and World. The companies are listed according to the main location they had chosen for their online profile.

Company Listings

The company listings section provides a company overview according to the products and services the companies are offering. When we first designed the Buyers Guide we debated whether it is preferable to offer as detailed product groups as possible or to try to list the companies in a higher level of aggregation. We decided for the latter being fully aware that we will miss some levels of detail but convinced that the user-friendliness does outweigh this. We have tried to come up with useful categories, but we are open to suggestions for our next editions, if you think we should add, omit, amend or change anything here. In this section we do not only provide the companies that actively presented their company profile in the Online Buyers Guide, but we added quite a few companies based on our own research, to make sure that you will get a very good overview and lots of choices for any upcoming decisions.

In an industry as innovative and dynamic as ours it will most likely never be possible to provide an overview that is final and complete, but we continue to do our best to come as close as possible.

▶ **Contact**
contact@inspect-online.com
www.inspect-online.com/buyers-guide

INSPECT Panel Discussion:

3D Vision and 3D Metrology

All You Ever Wanted to Know about 3D – Technologies, Applications, Benefits

3D: The annual market study by the EMVA, the European Machine Vision Association, documented that 3D technologies are on the rise. In the year 2008 already close to 10% of the total sales of application specific machine vision systems out of Europe were generated with 3D metrology. In this number the sales of 3D robot vision, 3D inspection, 3D identification is not even counted. Also in the halls of the Vision 2009 trade show it could be seen that 3D products are a hot topic this year. 11 out of 40-odd presentations in the Industrial Vision Days talk about 3D products or technologies. Significantly more than 10% of all the trade show exhibitors offered products for 3D applications one way or the other.

Now 3D technologies, what is that? That is a very generic term for a very broad field of methods, sensors, algorithms, and applications. Compared to the traditional 2D of machine vision, they come with an additional level of complexity, additional hardware requirements, and more often than not also additional cost is involved somehow.

So what is then the additional benefit for the user? Which technology is the best for which application? What is the state-of-the-art today and what more can be expected in the future?

These and other questions were pondered at the INSPECT panel discussion "All you ever wanted to know about 3D" during the annual Vision trade show early November 2009 in Stuttgart, Germany.

The six experts on the panel were:

- Dr. Wolfgang Eckstein, CEO and co-founder of MVTec Software;
- Dr. Heiko Frohn, Managing Director and Head of the Industrial Automation Division of Vitronic;
- Dr. Mats Gökstorp, Member of the Management Board and responsible for the Advanced Industrial Sensors Division of Sick;
- Per Holmberg, President of Hexagon Metrology EMEA;
- Leonard Metcalfe, Chairman of LMI Technologies;
- Dr. Christian Wöhler, Senior Research Scientist in the Environment Perception Department of Daimler Group Research and Advanced Engineering.

INSPECT: One of the main areas of 3D technologies today from the machine vision point of view is quality inspection. It is, for example, difficult to see the chocolate sprinkles on a chocolate cake in a grey value 2D image but it is rather easy to see it based on the 3D data. Which other areas of quality inspection are best addressed with 3D technologies? What are the pros and cons in comparison to the 2D technologies?

W. Eckstein: The first benefit is that you can reduce your cost, and the second benefit is that you can increase the quality. So two very nice aspects we should have in mind when looking at the current economic situation. Let me give you two examples on that. When we look for example into semiconductor one of the typical tasks is PGA inspection. We have these small solder balls on the board, they are round spheres and they have to be inspected. Classically this would be done in 2D, so we can measure the shape of the spheres. But what we cannot measure in 2D is the height of the spheres. So,

20 YEARS 09

GigEvolved

Break through the 90 MB/s barrier. The Prosilica series of GigE cameras offers a sustained data rate of over 120 MB/s and up to 240 MB/s thanks to an innovative, GigE Vision compliant interface. And if you are using multiple cameras on the same bus, you can even control how much bandwidth each camera utilizes. Now that all Prosilica GigE cameras have joined the camera range of Allied Vision Technologies, you have a virtually unlimited selection of sensors and features with a GigE or FireWire interface. See them all at **www.alliedvisiontec.com**

S E E I N G I S B E L I E V I N G

if you invest a bit more in the quality inspection at the production part, there is no need to combine the components to mount them and in the end to make the electrical inspection. Then the cost is much higher to remove the component. If you do it quite early then you can definitely save the cost. On the other hand we can improve the quality and for this, another example, again semiconductor: Think about the way how the die and the chip is connected to the lead frame. There are lots of very, very tiny wires and with nowadays chips you have multiple dies on top of each other which means you have hundreds of wires and you have to inspect if these wires touch each other. But if they are stacked on top of each other, you cannot do this in 2D any more. You need 3D inspection to see if they get close to each other.

M. Gökstorp: When you go to the 3D technology you get a lot of advantages and you get more or less independent from the color or the surface contrast of the objects. You can focus completely on the shape, on the dimensions and on the geometrical characteristics of the object. And specifically when you look into areas with metal parts or in packaging industry where there is a lot of colorful packages the task is much, much easier if you go to 3D technology instead of using the 2D technology. And this becomes specifically powerful if you can – with some fusion methods – apply both technologies at the same time.

Dr. Wolfgang Eckstein, MVTec Software

Dr. Mats Gökstorp, Sick

INSPECT: Another area where 3D technologies are not only in use for quite some time but actually on the upswing is robot vision. Multi camera systems guiding robots to apply sealant on a car, e.g., are standard production equipment. Stereo vision sensors mounted on the robot arm provide even higher flexibility. And 3D robot guidance based on the information provided by only a single camera was the roar two or three years ago already. Are there other technologies out there? Where is 3D robot vision mainly in use today and tomorrow?

H. Frohn: I see two major fields of application in robot vision. One is the one of rather simple but fast pick and place technologies which are dominated today by 2D technologies. The other one is one where the focus is on robustness and reliability or on more complex tasks which you couldn't probably solve robustly anyway without 3D. I would say the first field will not be for a long time a topic for individual robot vision systems because this will be more and more integrated into the robot itself. On the other side when we are talking about robot vision in the near to middle future we will always talk about 3D solutions. And maybe one more aspect: today we have a lot of different techniques for 3D perception but once time-of-flight is available as a standard component with higher resolution, then we won't talk about 2D robot vision any more.

L. Metcalfe: We use robotic inspection for both the metrology side in the automotive industry where we are using robots to do flexible inspection on an automotive line where the models are changing as they come down the line so the robots have to inspect different parts of a car. On the other side we're using time-of-flight sensors right now to do robot milking. That's a pretty wild harsh application area where you're operating at barn temperatures trying to put a milking machine on a moving cow. And 3D is the only solution to do that. I see a lot of mixtures of these technologies coming. I see time-of-flight being mixed with 2D technologies to be able to solve some of these problems.

INSPECT: 3D metrology is one field where 3D technologies are employed for many, many years and today an increasing number of coordinate measurement machines are equipped with optical sensors to speed up offline measurement. Projected fringes technologies are state of the art in rapid prototyping and inline measurement is providing several hundred 3D measurement points of every single car body to insure that dimensional tolerances are not exceeded along a complex production and assembly process. Although all of these methods basically go back to optical triangulation one way or the other, the single measurements in the different stages of product development and production are not combined today. And sometimes you think that they don't even seem comparable. Do you see this change into an integrated metrology in the future?

Dr. Heiko Frohn, Vitronic

Ch. Wöhler: This is a question basically of data management and putting data to-

Dr. Christian Wöhler, Daimler

gether in unique forms and comparison between data from different technologies from several systems. This is one side. On the other hand, it is still not easy to obtain 3D data especially in the context of car manufacturing of sufficient resolution, to obtain a good basis for comparison between for example CAD data and the measurements obtained. Most photogrammetric approaches have very high resolution and depth but have a rather low resolution in the lateral direction, at least when compared to imaging sensors. Where still lots of active research is currently done is the densification of photogrammetrically obtained 3D data, for example of car bodies or metal parts with difficult surfaces. So this is where I see the main perspective between the combination of classical metrology, bundle adjustment, fringe projection, perhaps even time of flight sensors and vision methods in the sense that the photometric properties of the surface are exploited.

P. Holmberg: We can do from an accuracy point of view or a speed point of view or from a simplicity point of view what the industry, what our customer wants. What is needed is the practical application bringing bundled the different technologies on the sensor side, on the carrier side, and on the reading or the analysis side, the software side together in a practical way. I would say one of the biggest hurdles is not each of the technologies that we are discussing here. It is really in the back end where

Per Holmberg, Hexagon Metrology

we see the experience and the reference points that the industry or the companies are sitting with and they can't go away from, that is the biggest hurdle here right now. The other hurdle is once again the practical going from quality control to process control, going from having 20 hours, 30 hours before you would need to give an answer until you've got six cycle times or 60-65 seconds and getting the robustness of the different technologies that you have to bundle together in this sense. That's where I see the barriers.

L. Metcalfe: I think the point is bringing all the data together and analyzing it. I watch in the automotive lines that we collect all this data, its great 3D data and a lot of times its not being used enough to look at the process and feed it back and find out why that robot, why that stud moved over 3mm and go back and fix the problem. In the sawmill industry we do a lot of 3D inspection, its close loop control; it actually goes back and changes the process dynamically. That hasn't been applied in a lot of industries yet and I think we're going to get there but there's a lot of software involved in that process and not a lot of expert input on how we should use that data. I think that's going to come from the factory floor.

INSPECT: Still another field, an emerging field for 3D technologies, is identification, the identification of persons, of objects, by making use of the additional information generated by 3D sensors. So for example face recognition based on projected fringes or PMD systems seems to deliver more reliable results than mere 2D feature comparison. In pharmaceutical packaging 3D codes are identified by shape-from-shading technologies and driver assistance systems are sup-

Leonard Metcalfe, LMI Technologies

posed to make use of 3D cameras in the future. So where else are 3D technologies employed for identification and what advantages are provided in comparison to 2D methods?

M. Gökstorp: We see today that we can provide added value by combining the code reading functionality with the 3D sensor capability. That enables us to read bar codes and OCR text on rubber tires for example. These are called black on black reading and that enables a higher level of traceability in the industry today.

H. Frohn: 3D is something like an enabling technology for the 2D identification. You just generate contrast out of 3D and then you have a 2D identification. And there are other examples where it is similar. For example in parcel sorting applications, you have 2D applications. It's just code reading, OCR reading, 2D code reading, so just classical 2D applications but that you couldn't do without knowing how the surfaces are oriented, where the surface is moving in 3D space. So, the 3D object identification or object recognition is something like a prerequisite that you can do your 2D job.

INSPECT: We covered four different application areas so far and learned through the discussion that 3D technologies in every single one of them provide more information, better data, and in some cases the only access to solve an application. So this is state of the art. To round this off a little bit I would like our experts here to take a look into their crystal balls and share with us their view of the future. Which further developments can be expected in 3D technologies and in which way will the end user benefit from these developments?

Ch. Wöhler: In my opinion the combination of different technologies, 2D, 3D, laser range finding and fringe projection with classical 2D image information will be a great benefit for the applier, as we are at Daimler, in the field of industrial metrology and vision because it will probably decrease the price and keep the accuracy at least constant. An important issue for us appliers of such technologies is always to have it available at moderate cost. Otherwise it won't be applied but some other methods for example, or no inspection at all will be performed, or it will be done differently, or the production process will be adapted. So an inspection technology needs to be affordable and at the same time in the domain of car manufacturing needs to cope with very difficult surfaces. That's where I see personally an important field of further development.

H. Frohn: First of all, we have heard only about the advantages of 3D technology so far. So where I'll start is that 3D is probably not the answer for everything. There will remain significant need or reasonable applications which should also be handled in the future with 2D. But, today already the decision of 2D or 3D is in many cases based on cost vs. a performance tradeoff decision and in these cases 3D will probably get stronger and stronger. The second notion I already mentioned: time-of-flight cameras to come as something to maybe dramatically change the field of robot vision. This is some development which will change probably much more than that. There is a possibility to open up entirely new application fields especially in natural environments and probably mainly used in the security and traffic applications.

L. Metcalfe: The key enabler of 3D is creating robust products to go on the factory floor. 3D added to 2D, whether you use time-of-flight to do it or structured light combined with 2D, lets you build a product that's quite robust and doesn't require so much fixturing when you put it on a production line and is a lot easier to install. Those of you who have been involved in using geometric pattern match-

ing realize that we have to do scaling all the time with 2D. When we add 3D to it all of a sudden geometric pattern matching is not as difficult because you don't have to scale any more because you actually know the object. So, the ability of using 3D to supplement and with sensor fusion, and bring all the different technologies together is going to make very robust products that can be installed by plant personnel and work right away without a vision engineer having to help install it.

P. Holmberg: Ease of use, ease of installation, and ease of use of the data coming out of it. I think that is what you will see here with the next one, two, three years, a new set of sensors coming out to the market in the different applications. However, that is not a limitation today. It's not a limitation today with regard to the carriers. The carriers will be looking in the industrial surrounding much simpler than today, much cheaper and more flexible and they are already there. It's just a question of making them field tested and practically usable to the man on the floor. However, what I think you will see as a change and what this industry – me included – has to do is to work pretty hard on not the data collection getting to 3D, but actually the manipulation of the data in a timely manner. You don't have this half hour, and you don't have this hour, you've got these 55 seconds in cycle times in lots of the processes out there and that's where we yet have to make use of the tools in an industrial comprehensible way. But, we are on the way doing that.

W. Eckstein: From the software side of view looking on 3D I would see a couple of points that should really come in the near future. First of all, doing inspection is a matter of speed, so currently 3D requires a lot of computation power within your PC and I can tell you that things are becoming way faster in the next years. What I also have mentioned already is that currently at least for a huge bunch of applications you still have to buy different components from different vendors. If, and I assume this will be the case, 3D will be successful then you will see solutions within the next years for a broad range of applications. You no longer need to buy different components but you get them integrated into one system. Together with this, I think like in other industries, like we see with cameras, we need standardization as well which is the path to integration of the components to make this quite easy. And finally at least for those technologies where 3D is not used that long we definitely need ease of use. We are doing 2D vision now for 40 years and it's still not over and as we learned it's definitely still be needed and it will continue. 3D vision in some industries we do for 20 years plus, in others for a couple years or not yet at all. So you can guess that in the next 20 years there is still a lot more to come.

M. Gökstorp: I think that 3D vision enables the next step in automation. We've been working with 2D a very long time and 2D has to a certain level matured. 3D provides a new growth opportunity and opens up new applications. One example which we touched upon earlier today is the topic of process control. Today you can apply a 3D vision system, measure the volume of dispensed dough for cookie making or bread baking and thereby you reduce waste. Customers saved a lot of money by reducing waste and measure the exact amount of dough with a direct feedback into the process control loop. This shows that 3D can take automation to the next level. The strong development towards ease of use is the key enabling factor. This is the key topic to get a further use of 3D in the industry. Once again that will enable the customer to think more about application, and less about the technology. I think it's a good vision if we at some time in the future can reach the level to have a 3D vision sensor or a 3D camera system as easy to use as an industrial sensor or a photoelectric sensor is today.

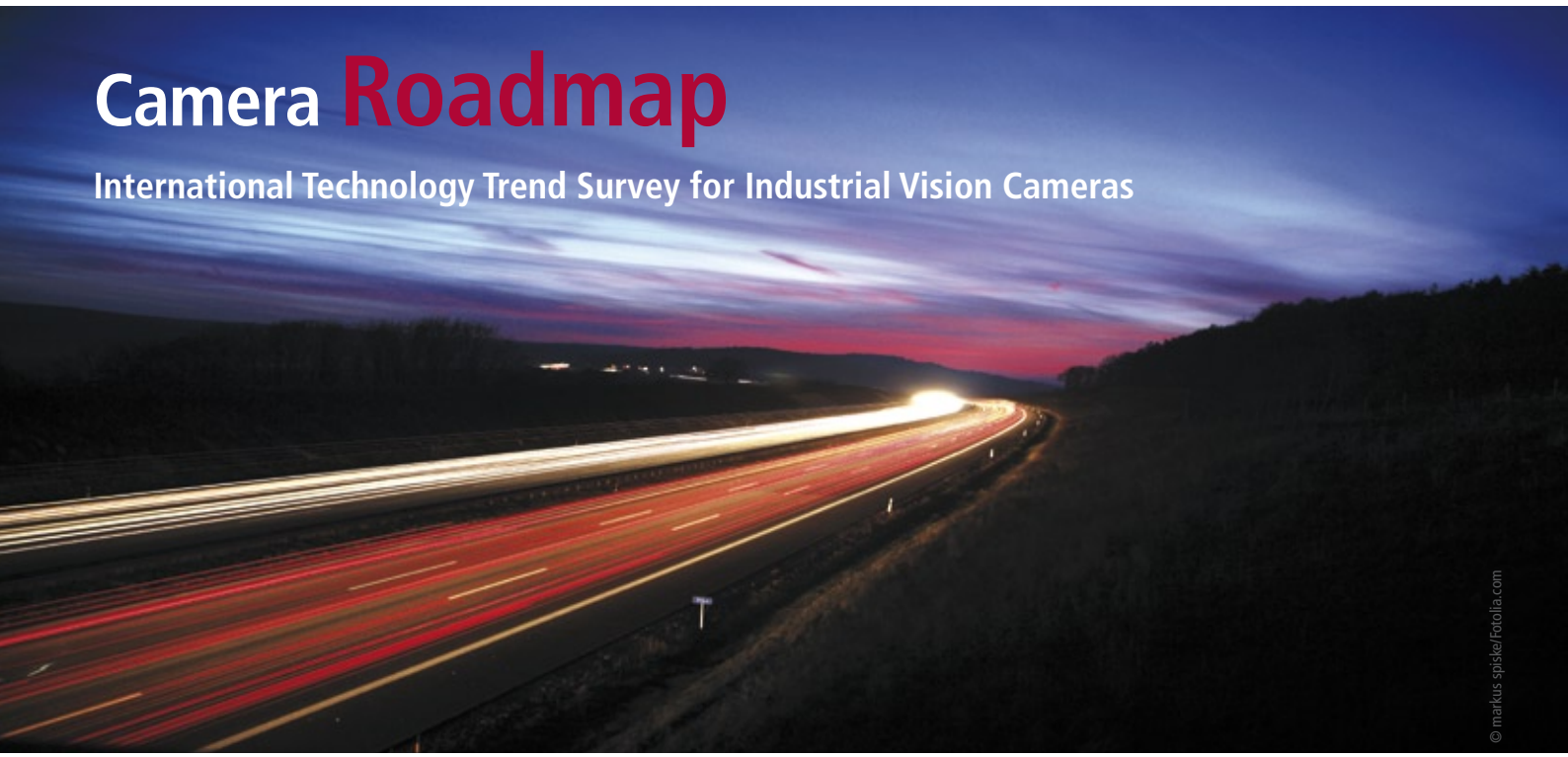
INSPECT: I would like to thank you for sharing your outlook into the 3D future with us and let's agree to meet here again five years from now to see how the 3D technologies will have evolved. For today I would like to thank you very much for joining me here in this panel discussion and through your presence making this a very outstanding event of the Vision Year 2009.

This is an edited transcription of only parts of the panel discussion. The audio stream of the entire panel discussion is available in the webcast section of www.inspect-online.com.

▶ **Contact**
INSPECT
contact@inspect-online.com
www.inspect-online.com

Camera Roadmap

International Technology Trend Survey for Industrial Vision Cameras



For suppliers and users of vision components and products alike, it is of high interest to learn which features are demanded today and what are the future trends. For the product class of cameras, which according to the annual EMVA study is the biggest component sub-group for machine vision products at about 27 % turnover share of total machine vision sales and about 63 % turnover share of machine vision components sales, a survey was conducted between August and October of 2009 to gather a wealth of data.

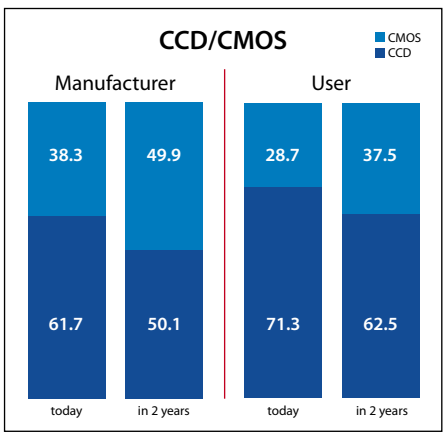
For the second time now, Framos Imaging Solutions, Munich, and INSPECT magazine together conducted this market survey for industrial vision cameras. Two different questionnaires have been compiled for camera users and camera manufacturers respectively, each in German and English language. Due to the significant differences in impact on the vision market that the different participants brought to the table, the number of employed or produced cameras was taken as a weighting factor. The higher the number of cameras has been stated, the bigger the impact of the individual answer in light of the total result. In order to avoid statistical distortion of the study, the top 5 %, i.e. the biggest producers and users, were taken out of the evaluation. In addition, only questionnaires were accepted for the evaluation where the participant took at least five minutes time to completely answer all questions. Only then could the input be evaluated seriously.

In total 1,260 questionnaires have been returned. However, 1,011 of those questionnaires were either not completed or the completion was done in less than five minutes so that in the end a total of 249 questionnaires were accepted for evaluation. From these 68 participants are producers and 181 participants are users of industrial camera technology. After deducting the top 5 %, 66 producers and 172 users remained. That means that after taking care of all distorting factors there was still a good number of questionnaires to evaluate so that the study does have a reasonably good statistical relevance.

The producers covered in the survey manufactured between one and 200,000 cameras in 2009. The users named numbers of cameras employed between one and 15,000 during the same period of time. After deduction of the top 5 % the maximum number cameras per manufacturer was stated at 100,000 units, the maximum number of cameras employed by one user has been at 2,000 units. On average the participating manufacturers produced 3,979 cameras (2008: 5,330 cameras) mainly for industrial use at 37 %, with security following at 25 %, scientific at 16 % and a large portion of unspecified others at 22 %. The largest chunk of cameras went to the electronics industry at 22 %, followed by medical technology at 13 % and paper/textile at a combined 12 %. The participating users on average employed 98 (in 2008: 97) cameras mainly for applications in industry (60 %) and security (17 %).

CCD or CMOS

Questioned about the percentage of CCD chips and CMOS chips, respectively, in the used or sold cameras today and in two years time, producers confirmed the significant shift towards the CMOS tech-



Distribution of CCD and CMOS cameras today and in two years time

Customized optical systems

With its customer-specific developments for optical, optomechanical and optoelectronic subassemblies, Docter Optics has helped to improve the value chain of many manufacturers of optical systems.

A wide array of standard lenses designed and produced by Docter Optics helps to create solutions that make technical and economic sense.

www.docteroptics.com

DOCTER® OPTICS

TURNING IDEAS INTO COMPONENTS

nology expressed in last year's survey. Currently 38 % (2008: 28 %) of cameras sold are CMOS cameras, 62 % (2008: 72 %) are CCD-based cameras. In two years time the manufacturers expect an increase to 50 % of CMOS cameras.

The users currently still utilize 29 % CMOS cameras as opposed to 71 % CCD cameras (2008: 30 % to 70 %). An increase by 8 % to a ratio of 38 % CMOS cameras is expected within the next two years. Consequently, the users expect that there will still be a share of 62 % of CCD cameras put into use in 2011.

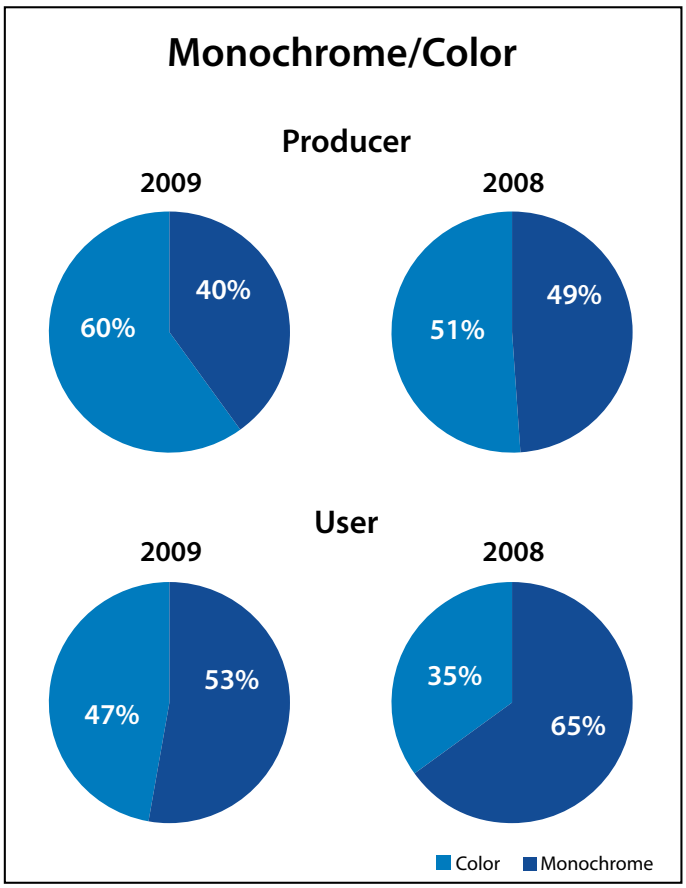
Trend towards Color Confirmed

Last year we stated that it will be interesting to see if the trend towards color cameras that was expected by the producers but could not yet be seen at the user's side, will come true. The results of this year's survey show a trend in this direction. The distribution between monochrome and color cameras has been at 51 % color cameras and 49 % monochrome cameras in 2008 on the manufacturer's side. For the users this ratio was significantly different at 35 % for color cameras and 65 % for monochrome cameras.

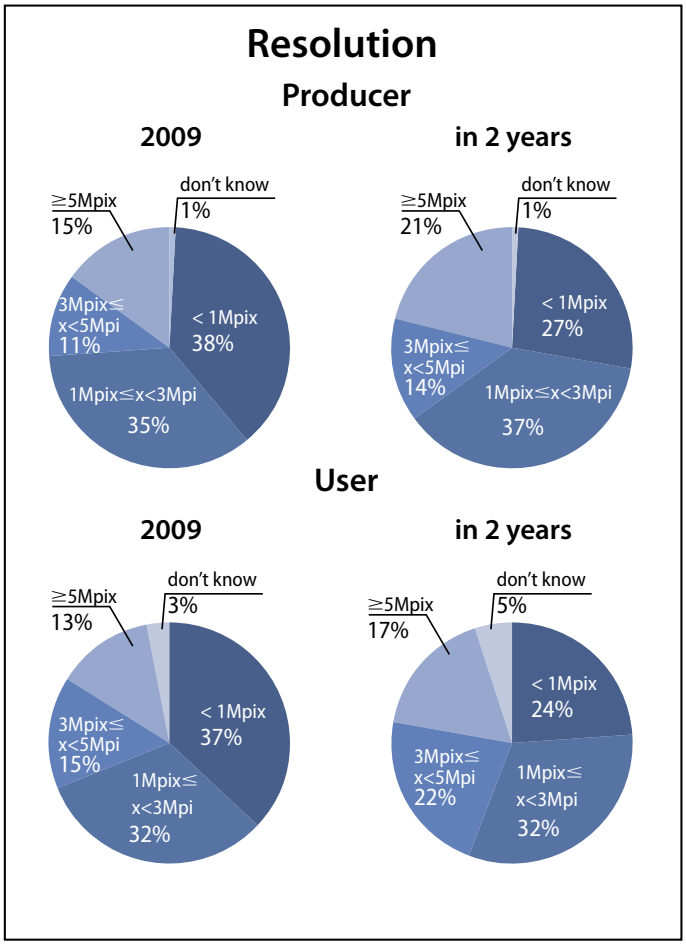
In the 2009 result the gap between the producer numbers and the user numbers is slightly decreased: 40 % color cameras and 60 % monochrome cameras on the camera manufacturer side, and 53 % of color cameras compared to 47 % of monochrome cameras on the user's side.

Big Change in Camera Resolution

The biggest year-to-year change that was revealed by the survey was the distribution of camera resolution. The results by far surpassed the expectations of the survey participants of last year.



Shares of monochrome and color cameras compared between 2008 and 2009



Manufactured/deployed camera distribution by resolution

Table 1: Current and expected distribution of interfaces form the national and international manufacturers view (percent)

	National '09		International '09	
	today	in 2 years	today	in 2 years
IEEE1394a	13.83	25.19	12.14	25.04
IEEE1394b	15.50	24.81	13.08	24.87
USB 2.0	15.25	22.90	21.07	10.76
Camera Link	14.96	22.90	13.36	10.76
Ethernet	19.56	0.38	19.12	26.81
GigE	15.85	3.82	16.60	1.76
others	5.05	0.00	4.63	0.00
	100.00	100.00	100.00	100.00

Table 2: Current and expected distribution of interfaces form the national and international users view (percent)

	National '09		International '09	
	today	in 2 years	today	in 2 years
IEEE1394a	15.86	21.29	16.77	12.89
IEEE1394b	13.30	25.89	13.07	27.10
USB 2.0	17.21	9.01	13.56	18.50
Camera Link	18.00	10.24	19.14	8.48
Ethernet	14.61	17.31	14.74	22.32
GigE	15.54	14.16	18.59	9.73
others	5.48	2.10	4.13	0.97
	100.00	100.00	100.00	100.00

The camera manufacturers declared within the survey that 38 % (2008: 71 %) of their products today belong to the class below 1 Megapixel, 35 % (2008: 14 %) are between 1 and 3 Mpix, 11 % (2008:10 %) in the 3–5 Mpix range and 15 % (2008: 4 %) are in the high resolution class of more than 5 Mpix.

For the users the distribution looks very much alike in the lower resolutions with 37 % (2008: 49 %) below 1 Megapixel, 32 % (2008: 32 %) between 1 and 3 Mpix, and only slightly different at the higher resolutions with 15 % (2008: 11 %) in the 3–5 Mpix class and 13 % (2008: 6 %) above 5 Mpix.

In two years time the camera manufacturers expect the current situation to change toward: <1 Megapixel at 27 %, 1–3 Mpix at 37 %, 3–5 Mpix at 14 % and >5 Mpix at 21 %. 1 % of the producers did not answer this question.

The camera users indicated the following distribution of camera resolution for 2011: below 1 Mpix at 24 %, 1–3 Mpix at 32 %, 3–5 Mpix at 22 % and >5 Mpix at 17 %. 5 % of the participants did not answer this question.

In summary, both manufacturers and users expect an ongoing trend towards the higher resolutions. The least change is expected for the class between 1 and 3 Mpix, here the share is expected to stay relatively stable at around 30 %.

Dynamic Developments for Interfaces

In many of the survey questions there was no significant difference between the answers of national (German) and international participants. This, however, is very different when asked to prioritize the choice of interfaces and to estimate the interface distribution in two year's time (table 1).

Also from the users point of view the distribution today is very similar between national and international users, the prognosis for the future, however, differs visibly (table 2).

Last but Not Least …

… there is always the question of how to choose from the abundant supply of different cameras. Which are the aspects the suppliers put special emphasis upon in order to convince with their product range and which criteria are relevant for the customer decision? And are both aspects in line?

In answer of the question „Please list your top five criteria for camera selection," manufacturers and users named the following features:

Manufacturer	User
Frame Rate	Price
Resolution	Resolution
Price	Frame Rate
Image Quality	Size/ Mounting Form
Size/ Mounting Form	Interface

Within our short summary we could only cover a small portion of the market study results. The complete evaluation and thus also data regarding frame rates, read-out technologies, optical mounts and sensor formats, but also regarding the future development of smart cameras and the expected pricing for cameras, have been provided exclusively to the participants of this study in appreciation for the time they took and the valuable data they provided.

▶ **Contacts**
Framos GmbH, Pullach/Munich, Germany
Tel.: +49 89 710667 13
Fax: +49 89 710667 66
s.zimmermann@framos.eu
www.framos.eu

INSPECT
contact@inspect-online.com
www.inspect-online.com

The Only Real-time Machine Vision Network Protocol

Interface for High Bandwidth Applications: Camera Link

During the early years of the machine vision market in the 1980s and 1990s, the scientific and industrial digital video market lacked a standard method of communication, resulting in hundreds of proprietary connectors, cables, and pin outs. Back then, cameras generated analog signals that were converted to digital values at the frame grabber and/or processing unit. Even after the cameras began to issue digital signals, frame grabber and camera manufacturers continued to develop products with different connectors, making cable production difficult for manufacturers and very confusing (and expensive) for consumers. The need for an interoperable real-time digital connectivity protocol that offered a standard interface for components from different manufactures grew with an expanding universe of machine vision components and increasing data rates as customers demanded higher resolution images at faster frame rates for industrial applications.

Working with machine vision original equipment manufacturers (OEMs), the Automated Imaging Association (AIA) helped to develop the Camera Link 1.0 digital, bi-directional serial communication protocol for industrial and scientific imaging. Today's Camera Link 1.2 standard interface makes large segments of machine vision equipment interoperable, offers real-time, high-bandwidth communication between camera and frame grabber, reduces support time and cost while giving customers greater flexibility by avoiding single-source, proprietary hardware solutions. Next generation Camera Link 2.0 will deliver even higher bandwidths, in small packages, and with more robust cabling solutions.

Camera Link Basics

Camera Link is a digital communication protocol designed for computer vision applications based on the National Semiconductor communications protocol chipset, Channel Link. The base Camera Link standard uses 28 bits to represent up to 24 bits of pixel data and 4 bits for Video Sync signals. These consist of Data Valid, Frame Valid, and Line Valid bits and a spare for future expansion. The data is serialized 7:1, and the four data streams and a dedicated clock are driven over five LVDS pairs in each direction. The remaining three LVDS pairs supply power to the device and allow for remote camera control.

Camera Link comes in three configurations, depending on the required bandwidth: base, medium, and full. Each configuration operates at one of three chipset frequencies (40 MHz, 66 MHz and 85 MHz), which also impact bandwidth. The „Base" Camera Link configuration carries signals over a single connector/cable. The cable used is a MDR („Mini D Ribbon") 26-pin Male Plug Connector, optimized by 3M for the LVDS signal. At the maximum chipset operating frequency (85 MHz), the base configuration yields a video data throughput of 2.04 Gbps (255 MBps). The „Medium" configuration doubles the video bandwidth through a second cable, adding an additional 24 bits of data and the same four framing/enable signals present in the „Base" configuration. This yields a 48-bit wide video data path capable of throughput up to 4.08 Gbps (510 MBps). The „Full" configuration adds a third 24-bit channel to the data path, resulting in a 72-bit wide video path that can carry 6.12 Gbps across two Camera Link cables.

Real-time Advantage

Today, Camera Link accounts for approximately 20% of all new machine vision installations, while Ethernet (Gigabit Ethernet and GigE Vision) account for nearly 80% of new installations. The reader may ask why haven't USB and FireWire claimed more of the machine vision market, and the answer lies in interoperability, bandwidth, and robustness.

Camera Link's maximum bandwidth of 6.1 Gbps is significantly higher than USB 2.0's maximum bandwidth of 480 Mbps, and even FireWire 800 (800 Mbps). USB and FireWire are limited to single cable runs of 5 m or less, while Camera Link, running on the 40 MHz chipset, can transmit up to 10 m without a repeater. Higher 85 MHz runs are typically shorter than the 10 m maximum distance. As a

Camera Link is the preferred interface for high bandwidth applications. JAI's AT-200CL camera shows dual Camera Link interfaces configurable for Base, Medium, or Full output (Photo by JAI)

Configurable frame grabbers can support four base or two full and 10-tap Camera Link cameras as shown with BitFlow's Karbon CL-4
(Photo by BitFlow, Inc.)

result, AIA working with OEM cable manufactures have come up with a new way to test and qualify Camera Link cables using their electrical response instead of conductor type. Finally, USB's tree topology, and FireWire's ring topology transmit data based on network availability and are not built for real-time parallel communications. Among the various non-proprietary network protocols used by machine vision designers today, only Camera Link offers real-time, high-bandwidth parallel communications.

In addition to real time data, Camera Link also offers four general-purpose camera control lines that can be defined by the camera manufacturer to control any camera feature, giving camera manufacturers opportunities to differentiate their equipment while still complying with an industry standard interface.

Finally, with Camera Link 1.2, manufactures now can build smaller cameras and power those cameras using Power over Camera Link (PoCL). The latest standard adds the new HDR or SDR 26-pin connectors, which are approximately half the height and width or one quarter of the total size of the existing MDR connectors, similar to USB and mini-USB.

Camera Link 2.0 – Faster, Better, Cheaper

Although Ethernet and GigE Vision dominate machine vision network protocols today, it is very unlikely that these standards will eliminate the need for Camera Link because Ethernet is not a real-time protocol. In anticipation of growing bandwidth demands and the emergence of 10 GigE, AIA's Camera Link committee is working on the 2.0 standard, which targets bandwidths of up to 30 Gbps, while preserving backwards compatibility with existing Camera Link systems.

As you can see, Camera Link represents the only standardized real-time network protocol for machine vision applications. While some may point to cost and the need for a Camera Link frame grabber as a detriment to the Camera Link protocol, the truth is that Camera Link represents the lowest-cost, highest-performance machine vision protocol. USB, FireWire, and Ethernet all require an IP layer in the camera and processing unit to packetize the data in addition to the physical (PHY) layer chipset, which carry their own costs. Another issue is the cost of developing Gigabit Ethernet competency within the OEM. While most engineers can take the Camera Link standard, read the document and get up and running in just a few hours, learning the right way to implement Gigabit Ethernet requires a time and labor investment for success.

Camera Link's market share may be small, however, when it comes to complex high-speed machine vision systems, Camera Link represents the best choice for camera to processor communication. For information on obtaining the Camera Link standard, plus a list of Camera Link suppliers and compliant products, visit the "Vision Standards" section of AIA's website.

▶ **Authors**
Steve Kinney, JAI, Director Technical Pre-Sales and Support, Chair of AIA's Camera Link Standard Committee

Jeff Fryman, Automated Imaging Association, Director Standards Development

▶ **Contact**
AIA
Automated Imaging Association,
Ann Arbor, MI, USA
Tel.: +1 734 994 6088
Fax: +1 734 994 3338
jfryman@robotics.org
www.machinevisiononline.org

Transparency for Industrial Cameras and Sensors

Objective Specification of Vital Camera Data: EMVA 1288

Choosing the suitable camera for a given machine vision application often proves to be a challenging task. The data sheets provided by the manufacturers are difficult to compare. Frequently, vital pieces of information are not available so that users are forced to conduct a costly comparative test, which still fails to deliver all relevant camera parameters. This is where the EMVA 1288 Standard comes in. It creates transparency by defining reliable and exact measurement procedures and data presentation guidelines.

1288
EMVA Standard Compliant

Specification Parameters Currently Covered by the EMVA 1288 Standard:

- Color
- Spectral sensitivity
- Signal/noise ratio (maximal SNR, dynamic range, dark noise)
- Inhomogeneities (DSNU, PRNU)
- Linearity
- Defect pixels
- Trigger delays and jitter

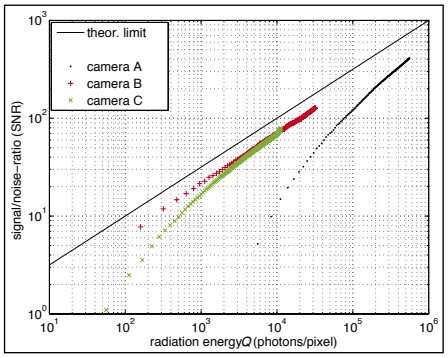
The EMVA 1288 Standard has been developed by a working group of over 20 leading manufacturers, vision users and research institutes within the European Machine Vision Association (EMVA). The group was founded in 2004 with the aim to assist users of industrial cameras in their selection process. The quality and the parameters of a camera (or of an image sensor) can be described by objective criteria as the operation of any digital camera system is based on elementary physical principles, which are well understood. Consequently, the aim of the working group has been to define a set of objective parameters, the necessary measurement procedures and data presentation guidelines which are all contained in the EMVA 1288 Standard.

Benefits for Users and Vendors

The EMVA 1288 standard allows users of image sensors and cameras a true datasheet-based comparison of different products. Specifications are clearly defined as are the measuring methods. This helps the user to take an objective decision. The definition of data presentation guidelines further increases transparency and comparability. In addition, it assists in modeling and optimizing image sensor performance for a given application.

Manufacturers of image sensing equipment also benefit from the EMVA 1288 standard: By complying with it they can clearly communicate the performance and quality of their product to their customers and help them select the most suitable camera or image sensor for the planned application. Numerous manufacturers also use the standard in their R&D departments when developing and testing new products. This has already had a positive impact on camera quality and performance.

Not only camera manufacturers offer 1288-compliant products. The standard covers image sensors as well
(Sources: Basler, PCO, Awaiba)



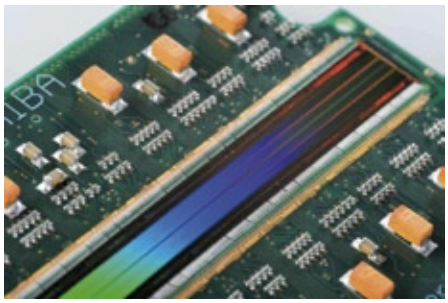
The 1288 Standard is based on elementary physical principles which are clearly defined and allow an objective characterization of key properties of cameras and image sensors, such as the signal/noise-ratio

Five Parameter Categories for Camera Performance

Sensitivity: The intensity of a camera signal does not adequately describe its quality. The relevant parameter is the ratio between signal and noise (SNR) at a given illumination and wavelength. The best sensor theoretically conceivable would have a quantum efficiency of one and zero dark noise. This theoretical limit is used to describe how much the actual sensitivity of a real camera system falls short of the ideal one.

Linearity: A number of applications, especially measuring tasks, require a linear relationship between the intensity of illumination and the digital gray scale value. Therefore, the EMVA 1288 Standard specifies a measure that describes the deviation from this ideal linearity.

Dark current: In an image sensor, a signal is generated which is not dependent on the intensity of the illumination but created by purely thermal effects.



This so-called dark current accumulates charge over time. This effect determines the maximum useful exposure time of a camera.

Homogeneity: Due to the fact that a camera contains a multitude of sensor elements, these will not have exactly identical properties and therefore certain variations will inevitably occur. The image quality is heavily influenced by the type and intensity of these variations which will show as static pattern ("fixed pattern noise") in the images.

Trigger behavior: In many applications, the image acquisition needs to be synchronized with external events or several cameras have to take images simultaneously. In these cases, it is essential to know the delay between the trigger signal and the start of the image acquisition (trigger delay) and how this delay is varying (the so-called jitter).

New Version 3.0 to be Released Soon

At Vision 2009 in Stuttgart, Germany, a preliminary new version 3.0 of the EMVA 1288 was presented at the Special Exhibition on International Machine Vision Standards. An extensive comparative test of six cameras that were tested in different laboratories worldwide had been preceding it and resulted in a great deal of practical experience in applying the standard effectively. The final version 3.0 will be released in the first quarter of 2010. In the near future, the standard is planned to be further expanded to include non-linear cameras and special camera types such as time-of-flight (TOF) cameras.

Easy Access to the EMVA 1288 Standard

More information on the standard and licensing documents are available at www.1288.standard.org. The complete standard can be downloaded free of charge. The working group is open for manufacturers, system integrators and distributors of cameras and image sensors. Institutes carrying out research in this field are also welcome to join. Participation is free of charge. Producers who wish to introduce 1288-compliant products must first obtain a license from the EMVA which is also free of charge.

▶ **Authors**

Prof. Dr. Bernd Jähne, Coordination Director of the Heidelberg Collaboratory for Image Processing, University of Heidelberg, Chairman EMVA 1288 Working Group

Patrick Schwarzkopf, EMVA General Secretary

▶ **Contact**

European Machine Vision Association – EMVA, Frankfurt, Germany
Tel.: +49 69 6603 1466
Fax: +49 69 6603 1689
info@emva.org
www.emva.org

Camera Network of the Future

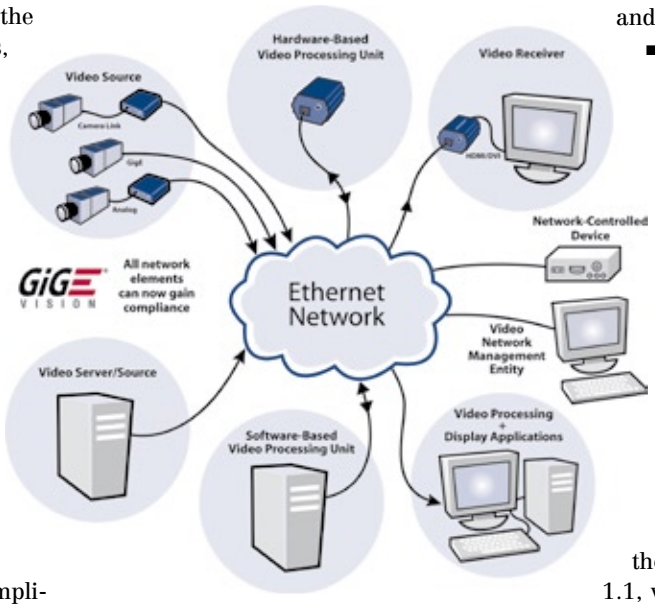
Reduced Hardware Count and Increased Interoperability: GigE Vision

Ethernet dominates the world's local area networks (LAN). So it makes sense that the machine vision industry would find a way to bend the consumer network standard to industrial imaging purposes. GigE Vision, based on the Gigabit Ethernet User Datagram Protocol/Internet Protocol (UDP/IP) standard, combined with the GenICam generic interface for cameras, reduces hardware count and increases interoperability for machine vision systems by eliminating the need for a specialized frame grabber. Today, any PC running GigE Vision compatible image processing software with an Ethernet port can communicate with a GigE Vision compatible camera simply by connecting the two with a standard Ethernet cable. This fact is why Ethernet and its GigE Vision variant account for up to 80 % of new machine vision system installations.

The GigE Vision Standard – True Plug and Play Interoperability

The GigE Vision standard is based on Internet Protocol (IP) with no changes to the physical layer. However, to make the Ethernet standard applicable to the needs of industrial imaging systems, 50 companies along with the Automated Imaging Association (AIA), developed the GigE Vision standard by adding application layers on top of the UDP/IP layer to enable automatic detection and communication between GigE Vision-compliant cameras and Ethernet-enabled computers.

GigE Vision helps meet the growing demand for advanced network architectures with interoperability between all network elements
(Graphic: Pleora Technologies) ▼



The GigE Vision enhancements to Gigabit Ethernet include:

- The GigE Vision Control Protocol (GVCP), which runs on top of Universal Datagram Protocol (UDP) IPv4. It defines how to control and configure compliant devices such as cameras, specifies stream channels and control data to host computers. GVCP does not actually carry the image data.
- The GigE Vision Stream Protocol (GVSP), which defines data types and describes how images are transmitted over Gigabit Ethernet.
- The Gigabit Ethernet Device Discovery Mechanism, which defines how cameras and other compliant devices obtain IP addresses.
- An XML description file based on the GenICam standard, which provides the equivalent of a computer-readable datasheet to allow access to camera controls and image stream.

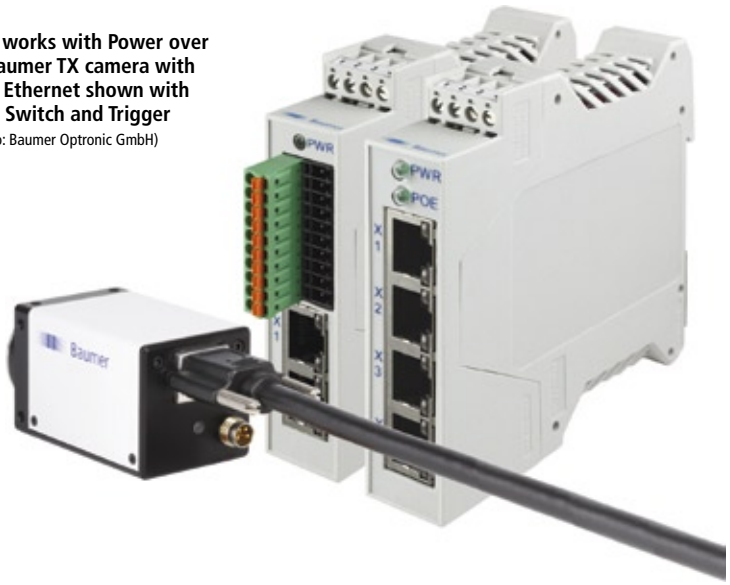
The GenICam standard developed by the European Machine Vision Association (EMVA) is an important part of a GigE Vision network. GenICam uses extensible markup language (XML) to tell any computer on the network running GigE Vision compatible software exactly how the camera operates, including pixel and array sizes, controls, signaling and much more. While the FireWire IIDC standard Mode 7 attempts to provide this same functionality, Mode 7 implementations vary by manufacturer, which can negatively impact plug-and-play interoperability.

While GigE Vision's GVCP and GVSP protocols represent a decoupling of GigE Vision from the Ethernet standard, the use of existing physical, transport, internet, and application layers means that GigE Vision users still get the benefit of Gigabit Ethernet networks, including:

- High bandwidth (1,000 Mbps) with up to 10 Gbps for GigE Vision networks expected by 2011.
- Data transfers up to 100 m without repeaters or hubs, compared with 10 m for Camera Link, and 5 m for USB and FireWire.
- Standard Gigabit Ethernet hardware allows single/multiple camera connection to single/multiple computers.
- Low cost cables (CAT5e or CAT6) and standard connectors.
- Scalable network that benefits from the growth of Ethernet bandwidth.

GigE Vision Moves Forward

The GigE Vision Technical Committee issued GigE Vision stan-dard 1.0 in May 2006. Since then, the committee issued Revision 1.1, which consolidated and improved the written technical standard and added 60 pages of supporting engineering guidance. GigE Vision 1.1 is currently available in English and Japanese languages. Revision 1.2, which the committee will finalize by the end of 2009, introduces non-streaming devices to the standard, such as GigE Vision-enabled lights. Using the GenICam XML standard, non-streaming components will now be automatically recognized by the computers on the network.



GigE Vision works with Power over Ethernet. Baumer TX camera with Power over Ethernet shown with GigE Power Switch and Trigger Device (Photo: Baumer Optronic GmbH)

Interoperability in action: The International Machine Vision Standards booth at Vision Stuttgart 2009 demonstrated the true value of the GigE Vision with 11 different cameras connected to two software platforms providing seamless integration between them (Photo: AIA)

Next year, the committee expects to release GigE Vision 2.0, which will include 10 GigE compatibility as well as packet and header changes to accommodate high speed cameras up to 10 Gbps. Other enhancements include consideration of including IEEE1588 for real time triggering. While the point-to-point Camera Link protocol does not have to worry about network-induced latency found in Ethernet-based LANs, GigE Vision can still be considered real-time for many machine vision applications because of its high bandwidth. Using IEEE1588, GigE Vision will be able to synchronize events among multiple devices and computers using a central clock with trigger jitter on the order of 1 µs.

GigE Vision 2.0 will also formally define Link Aggregation, which is already an integral part of the Ethernet specification. Link Aggregation allows multiple Ethernet connections to be used in parallel, allowing a camera-computer connection to double, triple, etc., Gigabit bandwidth between devices (30 Gbps).

To further maximize bandwidth, GigE Vision 2.0 is expected to include a formal image compression scheme likely based on JPEG, H.264, and/or other mainstream image compression standards. Again, the aim is to increase the quantity of images that can be transferred over the link. If the raw bandwidth cannot be increased, then another option is to reduce the amount of information in the images through compression.

For information on obtaining the GigE Vision standard, plus a list of GigE Vision member companies and compliant products, visit the "Vision Standards" section of AIA's website.

▶ **Authors**
Eric Carey,
R&D Director,
Dalsa Corporation,
Chair of AIA's
GigE Vision
Standard Committee

Jeff Fryman,
Automated Imaging
Association, Director
Standards
Development

▶ **Contact**
AIA
Automated Imaging Association,
Ann Arbor, MI, USA
Tel.: +1 734 994 6088
Fax: +1 734 994 3338
jfryman@robotics.org
www.machinevisiononline.org

Interconnection Made Easy

Generic Interface for Cameras: GenICam

GenICam is a tool to connect cameras from different vendors, with different interfaces via different software libraries to your software. Thus GenICam greatly simplifies the work of developers by allowing them to easily use and interchange a range of GenICam compliant cameras, regardless of the interface or protocol technologies, using a compliant application running on their PCs.

An Industry Driven Standard

Today's digital cameras are packed with much more functionality than just delivering an image. Processing the image and appending the results to the image data stream, controlling external hardware and taking care of the real-time part of the application have become common tasks for machine vision cameras. As a result, the programming interface for cameras has become increasingly complex. This prompted the industry to establish the GenICam working group within the European Machine Vision Association (EMVA) in 2004 with the aim of creating a generic interface for cameras. Today, more than 70 companies from all over the world are part of this initiative.

How Does GenICam Work?

GenICam is relevant for three product categories: cameras, transport layers and libraries. Simply put, these product categories form a chain, in which image data is transported from the camera via transport layers (low-level software drivers or frame grabbers) to libraries (or applications) running on a PC. In the other direction, control data can be sent from the PC to the camera, allowing users to adjust features and settings inside the camera, e.g. the exposure time or the gain. GenICam can be used with many different interface technologies such as GigE Vision, Camera Link, IEEE 1394 IIDC, USB, and others.

Any GenICam compliant camera can be easily connected as this demonstrator showed at Vision 2009 in Stuttgart

GenICam consists of four modules:

- GenApi – an XML description file format defining how to capture the features of a device and how to access and control the features of a camera in a standard way.
- SFNC (= Standard Features Naming Convention) – a list of standard features of a camera defined in terms of name, type, and functionality. Together with the GenApi module the SFNC yields plug & play.
- GenTL – a generic transport layer interface between software drivers and libraries for delivering image data from the camera to the customer's applications running on a PC.
- CL Protocol – the specification of the interfaces of a platform dependent dynamic-link library being used to convert a vendor-specific Camera Link serial protocol to a GenApi interface.

The GenICam API Reference Implementation

Although, strictly speaking, it is not a part of the standard, the GenICam working group has created and is maintaining a reference implementation. While the standard itself defines a universal and therefore abstract concept, the reference implementation is a concrete piece of software written in the C++ programming language which implements this concept and can be used to control cameras. It can be downloaded free of charge and supports Windows as well as Linux (in the 32 or 64 bit version).

GenICam – What Is in It for You?

The benefits of GenICam are manifold and depend on the user group. Machine vision users can easily combine the best products available and come to solutions fast. The software library uses a familiar API and with regard to the transport layer and camera, the user has the free-

dom of choice of the preferred interface. In general, performance and quality can be optimized and many smart features are available.

Vendors also benefit from the GenICam standard by lowering costs and increasing their markets. Suppliers of software libraries no longer need to adapt to different camera interfaces and all camera features are supported immediately and without additional effort. Suppliers of transport layer technology reach customers which are tied to a specific library and can provide hardware pre-processing. Camera makers no longer need to adapt to different drivers and libraries and can easily deliver smart features through all software libraries.

GenICam Roadmap

At the Vision 2009 in Stuttgart the new version 2.0 of GenICam with numerous improvements and additional features was released. It ensures full backward compatibility with v1.0 cameras and allows easy migration from v1.0 to v2.0. The first products that are compliant with GenICam 2.0 are expected to be introduced in the first half of 2010.

GenICam 2.1 is already available as a beta version. It adds Camera Link support. The final release of v2.1 is scheduled to take place at the end of 2009.

Next on the agenda for the working group is the creation of additional documentation and tutorials. Further versions of GenICam will support additional compilers and platforms.

Easy Access to GenICam

The current version of the GenICam Standard can be downloaded free of charge from www.genicam.org. Here you will find a host of information about the standard, how it works and how you can make the best use of it. Machine vision companies are invited to join our working group and are welcome to contribute to the further development of the stan-dard. Camera manufacturers who would like to make their products GenICam compliant will find a downloadable license at www.genicam.org. The use of the standard is free of charge.

▶ **Authors**

Dr. Friedrich Dierks, Head of Software Development Components, Basler Vision Technologies, Chairman EMVA GenICam Group

Patrick Schwarzkopf, EMVA General Secretary

▶ **Contact**

European Machine Vision Association – EMVA, Frankfurt, Germany
Tel.: +49 69 6603 1466
Fax: +49 69 6603 1689
info@emva.org
www.emva.org

Ensuring Optical Image Quality

Interface between High Resolution Cameras and Lenses: Lens Mount Standard

There is no adequate standard definition for an interface between high resolution machine vision cameras and high resolution lenses. In addition to the appropriate geometric size of an interface, the optical axis of the lens in high resolution machine vision systems must be aligned very well to the orientation of the sensor inside the camera. The Japan Industrial Imaging Association hosts an initiative to propose a future global standard for lens mounts.

The Aim of the JIIA

The Japan Industrial Imaging Association (JIIA) is a Japan-based organization fostering technological innovation of industrial imaging, promoting global communication among the organizations related to industrial imaging, and thereby further contributing to the development in the field of industrial imaging world-wide.

Japanese industrial imaging companies now have a large share of shipment value in the global market including industrial cameras, input devices, image processors, image processing software, optical instruments, lighting equipment, measurement and analysis machinery, and so on. The position of Japanese industrial imaging technology is high and important in the global markets and JIIA is therefore expected worldwide to act as a leading developer of industrial imaging technology.

JIIA specifically aims to:

- promote standardization of industrial imaging technology,
- disseminate foreign general standards in Japan,
- constitute a network with foreign related organizations,
- promote/contribute the field of industrial imaging world-wide,
- compile statistics for the machine vision market study.

Standardization

Among all of the main activities of JIIA the standardization efforts have a very high priority. The specific steps in all standardization working groups are coming up with the technical specification for a new standard, taking the necessary steps to standardize, and promote the resulting standards for widely spread adoption.

Each specific standardization working group is formed by the Standardization Committee. Currently there are seven Working Groups such as Camera Link Working Group, GigE/GenICam Working Group, Next Generation Interface Working Group (Packet type, Clock type, CoaXPress), Next Generation Camera Protocol Working Group (IIDC2.0), Camera Spec Standard Working Group, Lighting Working Group, and Lens Working Group under the Standardization Committee to work on specification and standardization for various industrial cameras and peripheral products.

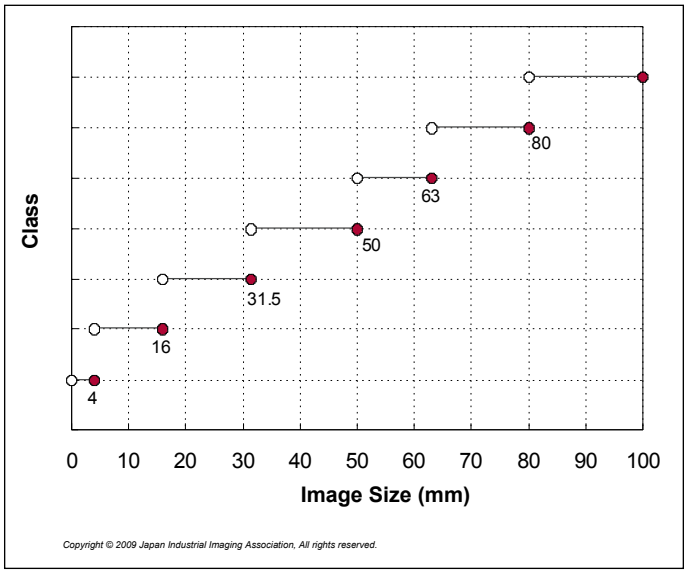


Fig. 1: Classification of Image Sizes (JIIA LE-001-2007)

Lens Working Group

This Group works on standardization for industrial camera lens mounts. There is a market trend that high resolution area sensors and line scan sensors are largely adopted in recent applications of industrial cameras leading to the need of more considerate specifications in robustness, handling, and ease-of-use for the interface between camera and lens.

Given the fact that there has not yet been a working group established for the standardization of lenses in either the AIA or the EMVA, this group has a great mission that the first proposal of standard specifications in the industry is disseminated. The standardization committee of JIIA is being aligned with the AIA, the EMVA, and other standard-setting organizations outside and inside Japan for standardization efforts, and will work and promote standardizations effectively and complementarily to each other.

Motivation for Standardizing Lens Mounts

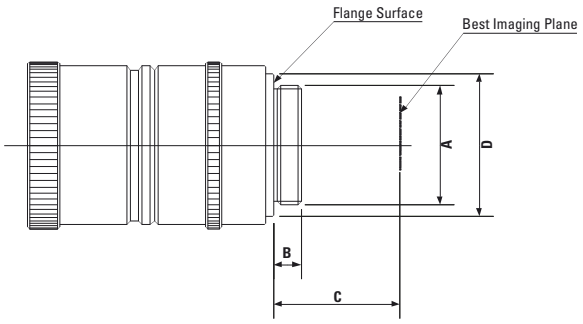
Regarding image sensors for machine vision cameras, there are several image sizes to be considered: the image size of 16 mm diameter or less of the C-mount camera, the 35 mm film format, the 7 µm x 12 k pixels line scan camera, and others. There are various adaptable lenses for image sensors with these wide-scale image sizes, therefore there are misgivings about differences of lens mount type be-

Table 1: Lens Mount Sizes for each Image Size (JIIA LE-002-2008)

Class	Image Size		Mount Size	Example of Existing Mount	
	Greater than	Less than or Equal to		Screw	Bayonet
I	0	4	6.3	M6.3	–
			8	M8	–
II	4	8	10.5	M10.5	–
			12	M12	–
			15.5	M15.5	–
			17	NF	–
	8	16	25.4	C*, CS	–
III	16	31.5	35	TFL	–
			42	M42	–
			48	TFL-II	F (47 mm) *
IV	31.5	50	52	M52	–
			56	–	–
V	50	63	64	–	–
			72	M72*	–
VI	63	80	80	–	67 (76 mm)*
			90	–	–
VII	80	100	100	–	–
			125	–	–

tween camera and lens, or size on each company, each model. Thus, the JIIA Lens Working Group aims at providing the standardization for the purpose of setting up the environment for proper fixation of lens mounts in combination with various equipments on the customer side.

We know that the majority of machine vision customers has many different requirements, but the Lens Working Group classifies these into the three major points of downsizing, low cost, and high reliability. All standardization activities are taking these aspects into account.



(Unit: mm)

Fixing Screws: Size _ Pitch	Basic Major Diameter A	Length from the Flange Surface to the Screw Edge B	Flange Focal Distance (Flange Back) C	Diameter of Flange Surface (Flange Diameter) D
M 17 – 0.75	17.000	4.1 JK under 4.1	12.000	20.0 JK under 20.0

Fig. 2: Specifications of the NF Mount (JIIA LE-003-2008)

Enacted Standards

The Lens Working Group has enacted three standards at this time.

- **JIIA LE-001-2007:** Lens Mounts for Machine Vision Cameras – Classification of Image Sizes
  This standard classifies the range of image sizes which covers most basic image acquisition elements in conjunction with standardization of the lens mount. The classification of image sizes is shown in figure 1.
- **JIIA LE-002-2008:** Lens Mounts for Machine Vision Cameras – Lens Mount Sizes
  This standard provides lens mount sizes to use for image size classes standardized by LE-001. The lens mount sizes to use for image size classes are shown in table 1.
- **JIIA LE-003-2008:** NF Mount Standard and Operational Regulations
  The "NF mount" is the lens mount originally designed and commercialized by Sony Corporation. JIIA intends to standardize "NF Mount" as a miniature lens mount for machine vision application. The specifications of the NF mount are shown in figure 2.

All standards can be downloaded at http://www.jiia.org/index_e.html.

Next Steps

There are many further issues on the lens mount specifications for machine vision; e.g., recommendations of lens mount tolerances for mechanical interfaces and alignment mechanisms for large format cameras. We have some plans to study these and other issues and to standardize on lens mounts in collaboration with the EMVA and the AIA members.

▶ **Authors**

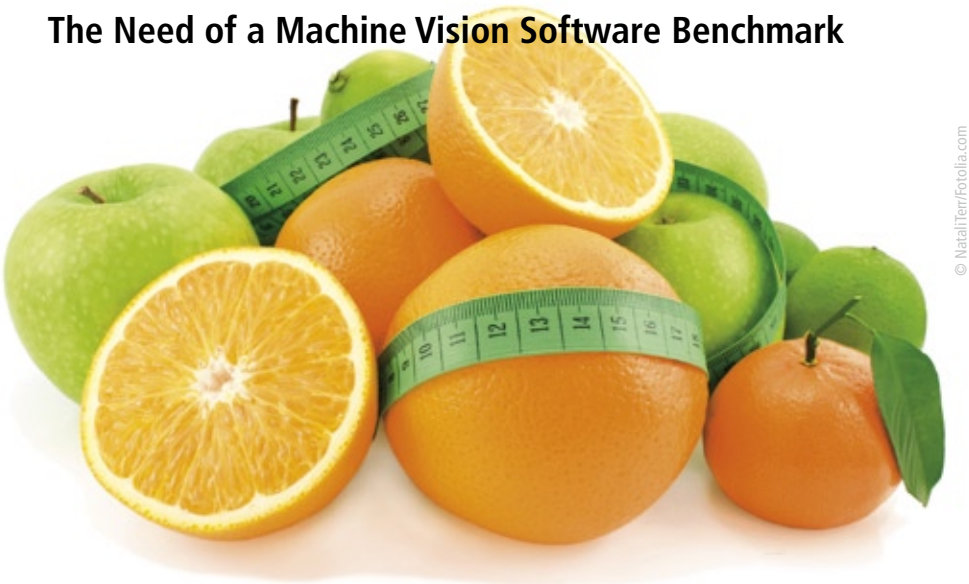
Kazuhiro Igarashi,
Hitachi Kokusai Electric Inc.,
Chair of JIIA Standardization Committee

Yutaka Yamaguchi,
Toshiba Teli Corporation,
Leader of JIIA Lens Working Group

▶ **Contact**
JIIA
Japan Industrial Imaging Association, Tokyo, Japan
Tel./Fax: +81 3 3716 3933
info@jiia.org
www.jiia.org

Comparing Apples with Oranges

The Need of a Machine Vision Software Benchmark



Engineers selecting an appropriate software package for their application are faced with the tremendous work of learning, programming and benchmarking one or more libraries. More information than just the execution time of operators – a typical part of a brochure – is needed to come to a resilient decision. Robustness of a solution, time needed for the development, and speed of the overall application are crucial, but cannot be found in brochures. A benchmark based on applications – not just on single operators – would provide significant help for the decision process.

A successful machine vision benchmark (MVB) should evaluate only the software and how it performs on various types of hardware, e.g., a standard CPU or a graphic processing unit (GPU). This implies that a machine vision benchmark should not be limited to software packages running on PCs, but should also be open to frame grabbers with processing capabilities, embedded systems, and smart cameras.

The intention of any MVB should be to bring more transparency into the market for vision software and vision systems. Such a benchmark should enable users of vision systems to determine more easily which software is most suitable for the requirements of a given application.

The aim of developing such a benchmark should not be to compare single methods such as the execution time of a Sobel filter, e.g., but to evaluate how well an application can be solved with the software. Additionally, a single benchmark should focus not only on the speed of such applications but also their usability, accuracy and robustness.

This kind of benchmark can be accomplished by supplying machine vision and image processing vendors with a set of one or more images stored as image files – together with a description of the images and the task to be performed on these images.

To develop such a benchmark, a commission has to be founded. The commission would operate under the umbrella of a broadly accepted association, such as the European Machine Vision Association (EMVA) or the Automated Imaging Association (AIA). To make the MVB a long lasting and fruitful one the members must comprise the leading suppliers for machine vision software.

The prime task of the MVB commission is to specify the rules for the MVB. Based on these rules, single benchmarks will be offered by MVB members and added to an MVB suite. In the same way every MVB member can perform tests by using the MVB and publish the results via the MVB commission. This approach would facilitate the development of an extensible MVB and, because the results would be visible to the whole community and to end-users, every software vendor would have a vested interest in ensuring that the MVB is up-to-date by using their latest software. This would ensure the MVB remains viable and always contains relevant information.

Rules for a Benchmark

In the development of an MVB, certain rules need to be established. These would include, for example, a description of a task to be solved, how the benchmark data was generated, or how results have to be published.

MVB would include different machine vision applications

Barcode

List of codes:
- Code 128
- RSS

List of benchmarks:
- Defocus
- Small module size
- Tilt
- Warping on cylinder
- Clutter
- Multiple codes
- Varying orientation
- Complex neighborhood background
- Inhomogeneous illumination
- Occlusion
- Too small quite zone

Data Code

List of codes:
- ECC200
- QR Code
- PDF 417

List of benchmarks:
- Same as barcode
- Damaged finder pattern
- Various typical printing styles

Pattern Matching

List of objects:
- Various types of objects would be used

List of benchmarks:
- Clutter
- Noise
- Overexposure
- Low contrast
- Occlusion

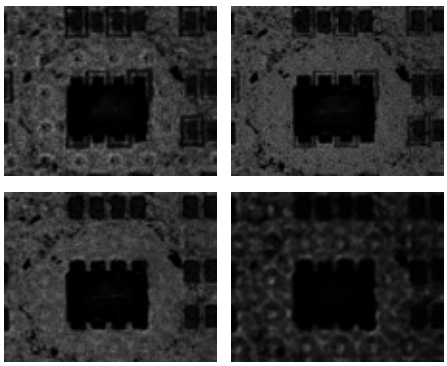


Image series example for a MVB in template matching: the original image of a PCB would be successively defocused to provide a specific image sequence

Benchmarks would be chosen from classical fields of image processing, like blob analysis, measuring, template matching, or OCR. Such benchmarks require a description of the task to be accomplished – without restricting the selection of operators. Besides the application oriented tasks, a specific – but widely needed – feature of a software tool can be analyzed, such as the robustness of a data code reader that is used to read perspectively-distorted codes or the robustness of matching with respect to blur.

For the benchmark data used it must be specified how it was generated, e.g., whether it was generated synthetically (or modified) or whether the image used was captured from a camera. For general documentation purposes, it would be useful to specify further data such as the optics and camera used for acquiring the test images.

In addition to the benchmark data, there must be a clear description of the task that has to be solved. Here it is important that the approach to solve the task is not limited and that any suitable software with any kind of approach can be used.

Furthermore, benchmark results submitted must specify which information was used to solve the task. For example, it must be clear whether the approximate location of an object or the orientation of a barcode was used to restrict the search within an image, because such kind of restrictions will have significant influence on speed and robustness.

Finally the version of the software that was used, the hardware the software was running on, and the benchmark's execution time must be made public.

Various methods of image processing also require the tuning of parameters used within a specific software package. Since these parameters might differ from the default values, these must also be specified. Optional information could also include the code fragment used to solve the benchmark task. Besides transparency, this would allow users to learn more about the use of a given system and to perform the same test.

How to Perform a Benchmark

After developing such an MVB, the benchmark data and its description should be made freely available. Based on these benchmarks, each manufacturer can develop optimal solutions and perform them. The MVB members can provide the results to the commission which publishes them after checking whether the rules are fulfilled. The publication of the results together with a description and source code guarantees transparency.

To begin the development of an MVB, these single benchmarks should be easy to understand, have clear semantics, cover typical machine vision tasks and allow an easy comparison of vision systems.

As a starting point, MVTec proposes a number of benchmarks (see table), each of which consists of a set of image sequences. Each sequence tests a specific behavior of a method. Within each sequence the influence of a "defect" is continuously increased. For example, in template matching, an original image of a PCB could be generated and then successively defocused to provide a specific image sequence. The quality of specific software can then be measured by the number of images that can be processed correctly. The tests would check the speed, robustness, and accuracy of each application task.

MVTec invites manufacturers and users to an open discussion to bring the idea of an MVB forward to increase transparency in the machine vision market.

▶ **Author**
Dr. Wolfgang Eckstein, Managing Director

▶ **Contact**
MVTec Software, Munich, Germany
Tel.: +49 89 457 695 0
Fax: +49 89 457 695 55
info@mvtec.com
www.mvtec.com


Kiel
Rostock
Pinneberg
Schwerin
Hamburg
Bremerhaven
HH
Emden
HB
Bremen
B
Berlin
Potsdam
Hanover
OS
H
BS
Osnabrück
Braunschweig
Magdeburg
GT
Gütersloh
Oberhausen
OB
Halle
Göttingen
GÖ
Duesseldorf
D
Leipzig
Dresden
DD
MR
Marburg
EF
Erfurt
Cologne
K
Jena
Chemnitz
J
C
Bonn
GI
Gießen
SHL
Suhl
Koblenz
KO
WI
F
Frankfurt
Wiesbaden
MZ
Darmstadt
Mainz
DA
MA
N
Nuremberg
Mannheim
Saarbruecken
KA
HN
Heilbronn
Karlsruhe
R
Regensburg
PF
Pforzheim
S
Stuttgart
Göppingen
Passau
OG
Offenburg
Tübingen
GP
TÜ
PA
Vienna
A
Augsburg
L
Linz
V
M
Munich
Baden
FR
Freiburg
Salzburg
KN
Ravensburg
RV
Konstanz
Kufstein
Basel
Zurich
SG
St. Gallen
ZH
Innsbruck
G
Graz
Neuchâtel
Lucerne
Vaduz
Schwyz
Bern
Lienz
Davos
Klagenfurt
VD
Lausanne
Geneva
Zermatt
Locarno
Como

Office(s)
Prosilica Inc.
Canada
Tel.:+1 604 875 8855
Fax:+1 604 875 8856
sales@prosilica.com

Allied Vision Technologies Inc.
United States of America
Tel.:+1 877 USA 1394
Fax: +1 978 225 2029
info@alliedvisiontec.com

Management
Frank Grube, CEO

Foundation
1989

Staff
101-250

Products
Cameras, Interfaces/Cables/Peripherals, Optics

Applications
Character Recognition, Digitalization, Inspection Piece Parts, Inspection Webbed Material, Part Identification, Robot Vision 2D, Robot Vision 3D

Industries served
Automotive and Suppliers, Electronics/Semiconductors, Foodstuffs/Beverages, Mechanical Engineering/Line Building, Medical Technology, Pharmaceuticals/Cosmetics/Chemicals, Plastics, Precision Engineering/Optics/Machine Vision, Traffic/Logistics

Associations
AIA, EMVA, JIIA, VDMA

Regions served
Asia, Europe, Latin America, North America, national

About Allied Vision Technologies

Founded in 1989, Allied Vision Technologies GmbH of Germany is a 100% subsidiary of the public Augusta Technologie AG. AVT designs, produces and sells cameras and components for image processing in various applications including industrial inspection, medical imaging, scientific experimentation, security, traffic monitoring, logistics and multimedia entertainment.

A Camera for Every Application

With innovative products, superior manufacturing quality and a service-driven organization, Allied Vision Technologies is well established as a premier provider of digital camera solutions for machine vision worldwide. Its product portfolio offers one of the widest choice of high-performance cameras with the two leading digital interfaces in the market: FireWire and GigE Vision. Black-and-white, color, high resolution or with a high frame rate: for every application there is the right AVT camera.

Thanks to the AVT modular concept, a wide range of modifications are available such as angled heads or alternative cable outlets. For even more specific applications, AVT has developed an expertise in tailor-made camera solution development.

High Quality Made in Germany… and Canada

AVT cameras are manufactured according to the highest quality standards in the company's two own production facilities located in Stadtroda (Germany) and Burnaby, BC (Canada). Highly skilled staff and ongoing investment in the state-of-the-art facilities guarantee the best possible product quality. Every single camera leaving Allied Vision Technologies' production undergoes a thorough test including operation under high temperature conditions.

First-Class Service, Worldwide

Allied Vision Technologies is represented in more than 30 countries worldwide by a network of distribution partners selected to offer a high level of service and support locally. The company has its own sales and support offices in Germany (Stadtroda), the USA (Newburyport, MA) and Canada (Burnaby, BC).

///ALLIED Vision Technologies

See our ad on page 9

Allied Vision Technologies GmbH
Taschenweg 2a
07646 Stadtroda
Germany
Tel.:+49 36428 677 0
Fax:+49 36428 677 24
info@alliedvisiontec.com
www.alliedvisiontec.com

J-1

Producer, Solution Provider

3D-Vision Systems for
Robotics: BinPicking
Medicine: Back and Foot Control
Human faces: Laser engraving etc.

ABW GmbH · Siemensstr. 3, 72636 Frickenhausen, Germany,
Tel.: +49 7022 949292, Fax: +49 7022 949294, info@abw-3d.de, www.abw-3d.de
TÜ-1

Producer

Adlink Technology provides a wide range of embedded computing products and services to the test & measurement, automation & process control, gaming, communications, medical, network security, and transportation industries. Adlink products include ETX and COM Express modules for industrial computing, AdvancedTCA, CompactPCI, PCI Express-based data acquisition and I/O and vision and motion control. Adlink provides customization and system integration services, and maintains low manufacturing costs.

ADLINK TECHNOLOGY INC.

Adlink Technology Inc.
Nord Carree 3
40477 Düsseldorf
Germany
Tel.: +49 211 495 55 52
Fax: +49 211 495 55 57
emea@adlinktech.com
www.adlinktech.eu
D-1

Machine Builder/OEM

Aicon 3D Systems is one of the world leading providers of optical camera based 3D measurement systems. Aicon develops and distributes systems for the business areas of inspection and testing including car safety and tube inspection. With Aicon's latest products for automated test and process control, the company enters new worldwide market fields. The majority of Aicon's clients operate in the automotive and aerospace market.

Aicon 3D Systems GmbH · Biberweg 30C, 38114 Braunschweig, Germany,
Tel.: +49 531 58 000 58, Fax: +49 531 58 000 60, info@aicon.de, www.aicon.de
BS-1

Distributor

We are an independent distributor, especially for Sony, Micron and Hirose.

AKE-Components GmbH · Bahnhofstr. 32, 76744 Wörth, Germany,
Tel.: +49 7271 9897 20, Fax: +49 7271 9897 29, sales@AKE-Components.de,
www.ake-Components.de
KA-1

Research Facility, Solution Provider

To our costumer we offer complete solutions for quality assurance using imaging processing and optical measurement.

Alfavision GmbH & Co. KG · Am Sportfeld 2, 94121 Salzweg, Germany,
Tel.: +49 851 75689 0, Fax: +49 851 75689 22, info@alfavision.de, www.alfavision.de
PA-1

Producer

Alicona is a leading supplier in high resolution optical 3D measurement. Even at complex topographies with steep flanks and strongly varying reflection properties measurements yield a vertical resolution of up to 10 nm. Alicona systems are successfully used in quality assurance in the lab and in production.

Alicona Imaging GmbH · Teslastraße 8, 08074 Grambach bei Graz, Austria,
Tel.: +43 316 4000 700, Fax: +43 316 4000 711, info@alicona.com, www.alicona.com
G-1

Solution Provider

Alysium-Tech is your partner for high performance interconnect solutions.Strong production and engineering capabilities contribute to high quality. superior, reliable and cost-effective solutions, which extend our customers' competitive advantage. Next to a wide range of Cable Assemblies for the machine Vision market (GigE, CameraLink, USB, Firewire, etc.), we are also looking forward to engineering and supplying the optimal solutions for your applications.

Alysium-Tech GmbH · Kuehnertsgasse 14, 90402 Nuremberg, Germany,
Tel.: +49 911 937878 0, Fax: +49 911 937878 93, vertrieb@alysium-tech.com,
www.alysium-tech.com
N-1

Distributor

AMS Technologies is a leading pan-European distributor of high-tech components and systems with superior engineering capabilities. The product offering comprehends active and passive components, subsystems and instruments. Components include transmitters, detectors, couplers, lenses and switches; sub-systems and instruments light sources, interferometers splicers, polishing machines and a wide range of accessories.

AMS Technologies · Fraunhoferstr. 22, 82152 Martinsried/Munich, Germany,
Tel.: +49 89 89577 0, Fax: +49 89 89577 199, info@ams.de, www.ams.de
M-1

Solution Provider

Asentics vision technology offers comprehensive know-how and long-year experiences for industry- and product-specific solutions for industrial image processing tasks. Competence by which our customers directly benefit, both economically and by further improving their product quality.

Asentics GmbH & Co. KG · Birlenbacher Str. 19–21, 57078 Siegen, Germany,
Tel.: +49 271 303 91 0, Fax: +49 271 303 91 19, info@asentics.de, www.asentics.de
K-1

Solution Provider

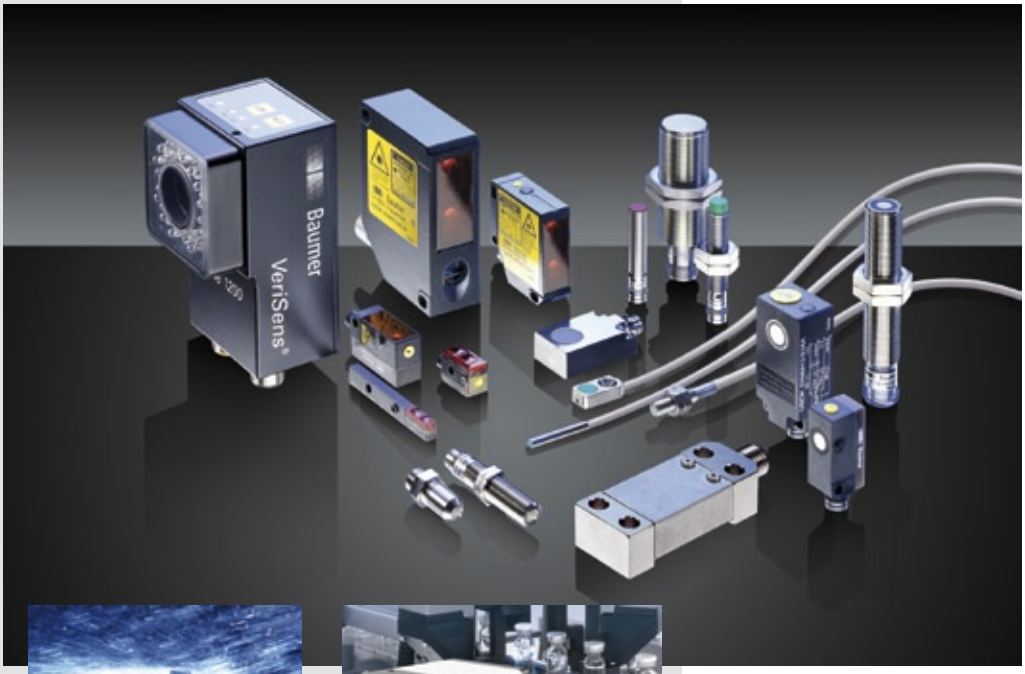
ATMvision develops Vision Inspection Systems with solution oriented concepts for the production processes for various industries. With highest efficient software concepts and using the newest 2D and 3D technologies, ATMvision develops "on the fly" and "stop & go"-systems. ATMvision manufactures the following automation and inspection technologies: Surface inspection, Measurement systems, Inspection systems, Robot vision, Quality check, 3D-technology. ATMvision supplies customers world wide.

ATMvision · Weiherstr. 5, 88682 Salem, Germany,
Tel.: +49 7554 986990, Fax: +49 7554 98699999, info@atmvision.com, www.atmvision.com
RV-1

Producer, Solution Provider

AT – Automation Technology was founded in 1998 as a systems house for industrial image processing. Its technologies mean that AT is a specialist in industrial infrared imaging and high-speed 3D image processing. Automation Technology offers the world fastest high-resolution 3D sensors for high-speed 3D measurement in accordance with the light-sheet triangulation method. Furthermore, AT is a provider of industrial thermography solutions for automation, monitoring and non-destructive testing.

Automation Technology GmbH · Hermann-Bössow-Str. 6–8, 23843 Bad Oldesloe, Germany,
Tel.: +49 4531 88011 0, Fax: +49 4531 88011 20, info@automationtechnology.de,
www.automationtechnology.de
HH-1



Management
Dr. Oliver Vietze, CEO and Chairman,
Rüdiger Förster, Sales Manager
Rainer Klug, Operations
Severino Bruno, Finance
Dr. Axel Vietze, Process Instrumentation

Foundation
1952

Staff
> 1000

Products
Cameras, Frame Grabber, Lighting Equipment, Optics, Software, Vision Sensors

Applications
Character Recognition, Digitalization, Inspection Piece Parts, Metrology 2D, Part Identification, Particle Analysis, Robot Vision 2D, Symbol Recognition, Others

Industries served
Automotive and Suppliers, Electronics/Semiconductors, Energy/Water/Solar Technology, Foodstuffs/Beverages, Glass/Ceramics, Mechanical Engineering/Line Building, Medical Technology, Metal, Packaging, Paper/Wood, Pharmaceuticals/Cosmetics/Chemicals, Plastics, Precision Engineering/Optics/Machine Vision, Traffic/Logistics, Other

Associations
EMVA, AIA, VDMA

Regions served
Asia, Europe, Latin America, North America, national

Baumer

Baumer GmbH
Pfingstweide 28
61169 Friedberg
Germany
Tel.: +49 6031 60 07 0
Fax: +49 6031 60 07 70
sales.de@baumer.com
www.baumer.com

See our ad on page 25

F-1

About Baumer

Baumer is one of the leading international manufacturers of innovative and high-quality sensors and systems in factory and process automation. With about 2,000 employees worldwide and 250 employees (including some 100 engineers) in the area of industrial image processing, Baumer belongs to the leading companies in the vision industry. Our customers benefit from internationally comprehensive consultation and reliable service.

Digital Imaging

Baumer offers a wide range of industrial digital cameras and customized OEM camera modules, specifically designed for demanding image processing applications. The portfolio includes matrix cameras, with various color and monochrome sensors. Resolutions are available from VGA up to 8 megapixel. The digital cameras support state of the art interfaces, like Gigabit Ethernet, CameraLink and FireWire. Next to that Baumer offers innovative developments, e. g. cameras with IP67 housing as well as cameras and network components for Power over Ethernet, the one cable solution for Gigabit Ethernet.

Smart Vision

Baumer VeriSens vision sensors close the gap between traditional photoelectric sensors and complex image processing systems. The user is provided with comprehensive functions which support numerous inspection tasks in automated production, like control of part completeness, control of part presence, or control of part location and identification. VeriSens vision sensors are characterized by an extremely compact design and, due to the innovative Baumer FEX processor technology, provide a process reliability in this class unachieved until now.

Sensor Solutions

Top performance in automation with leading sensor technology is our justified credo. The maximum performance, optimum reliability, the highest standards of safety in the minimum space at a fair price - these are the demands of the international markets on sensor technology for automation. Our products count, measure, sort and monitor. They identify size, position, colour, shape, defects, individual objects and much more. Your requirements are our challenge, which we have fulfilled millions of times throughout the world and daily fulfil to the satisfaction of manifold users.
.

Producer

Manufacturer of a modular construction kit for building machine vision installations, containing: – Mounting adapters and protective enclosures for cameras. – Mounting adapters and adjustable arms for lights. – Mounting adapters and adjustment brackets for buiding complete MV installations. Once equipped with the mechanical adapter, all vision components assemble and adjust without the need to manufacture any parts. The fast and cost efficient way to build your next MV installations!

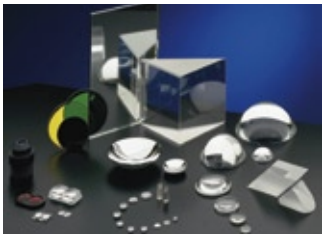
autoVimation Peter Neuhaus · Haid-und-Neu-Str. 7, 76131 Karlsruhe, Germany,
Tel.: +49 721 6276756, Fax: +49 721 6276759, sales@autovimation.com, www.autovimation.com

KA-2

Producer

We supply high-precision, high quality and cost effective moulded optical components. Our delivery program:

- spherical lenses and achromats from Ø 3,0 mm
- aspherical, spherical lenses and cylindrical lenses moulded
- prisms, filters, mirrors, windows, objectives
- cylindrical lenses
- plastic lenses
- LED optics
- Individual optical components and complete modular units
- Various technical glasses, moulde



B&M OPTIK

B & M Optik GmbH
Am Fleckenberg 20
65549 Limburg
Germany
Tel.: +49 6431 9860 0
Fax: +49 6431 9860 20
baldus@bm-optik.de
www.bm-optik.de

WI-1

Producer

Basler Components designs and manufactures digital cameras for industrial, medical, and traffic system applications, and also for the video surveillance market. Products include color and monochrome line scan and area scan cameras as well as innovative and flexible IP cameras. Basler has more than 20 years of experience in image processing. Product designs are driven by industry requirements and offer easy interfacing, compact size, and a strong price/performance ratio.

BASLER VISION TECHNOLOGIES
click. see. smile!

Basler Vision Technologies
An der Strusbek 60-62
22926 Ahrensburg
Germany
Tel.: +49 4102 463 500
Fax: +49 4102 463 599
bc.sales.europe@baslerweb.com
www.baslerweb.com

HH-2

Producer

Balluff, as a leading, globally active sensor specialist and connectivity provider with more than 2,190 employees, offers a full-range line of high-quality sensors, accessories and custom solutions for every area of factory automation. In addition to the main headquarters in Neuhausen, Germany, the company has production and development locations as well as subsidiaries and representatives around the world. This guarantees their customers fast, local availability of products, perfected service and high quality applications assistance anywhere in the world.

Balluff GmbH · Schurwaldstr. 9, 73765 Neuhausen, Germany,
Tel.: +49 7158 173 0, Fax: +49 7158 5010, balluff@balluff.de, www.balluff.de

S-1

Distributor

BFi OptiLas is a pan-European distributor of specialist products and services to the electronics and opto-electronics market. BFi OptiLas offers specialized imaging products including:High speed Imaging solutions with frame rates up to 150,000 fps • High power Laser illumination systems for welding seem inspection and visualisation of ultra fast, bright or hot objects • High-resolution CCD/CMOS Camera Systems with Ethernet or USB/FireWire interfaces & bull; Thermal IR OEM camera modules.

BFi OptiLas · Boschstr. 12, 82178 Puchheim, Germany,
Tel.: +49 89 890 135 56, Fax: +49 89 890 135 37, info@bfioptilas.com , www.bfioptilas.com

M-2

Integrator, Solution Provider

Bi-Ber's business is the development and manufacture of image processing systems for inline quality control. Our highly qualified engineers create fully integrated solutions tailored exactly to our clients' needs in industrial image processing. Bi-Ber focuses on creating image processing solutions for testing and inspecting electronic and mechanical components inside taping, test or assembly machines used by car component manufacturers and companies in medical technology and electronics.

Bi-Ber GmbH & Co. Engineering KG · Ostendstr. 25, 12459 Berlin, Germany,
Tel.: +49 30 5304 1253, Fax: +49 30 5304 1254, info@bilderkennung.de, www.bilderkennung.de

B-1

Producer

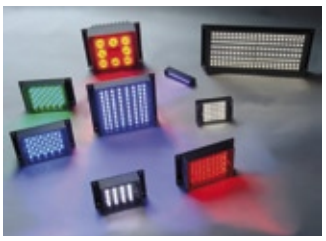
Breuckmann has been playing a key role in developing and optimising topometric 3D metrologies for more than two decades. With more than 300 systems installed per year, Breuckmann 3D scanners are among the most powerful and successful systems in the world of image-forming 3D metrology.

Breuckmann GmbH · Torenstr. 14 , 88709 Meersburg, Germany,
Tel.: +49 7532 4346 0, Fax: +49 7532 4346 50, sales@breuckmann.com, www.breuckmann.com

RV-2

Producer

The performance spectrum of Büchner Lichtsysteme GmbH extends from the concept via the development to the production of LED lighting systems. As a committed manufacturer we respond flexibly to the corresponding customer requirements. For instance, this includes the modification of our standard products as well as the development and manufacture according to customer-specific requirements.



IMAGING LIGHT TECHNOLOGY
BÜCHNER

Büchner Lichtsysteme GmbH
Büschelstr. 8a
86465 Welden
Germany
Tel.: +49 8293 909 112
Fax: +49 8293 909 111
info@buechner-lichtsysteme.de
www.buechner-lichtsysteme.de

A-1

Producer

Carl Zeiss SLR lenses for industrial applications are key components in complex production chains. In measuring tasks, quality assurance and many other applications, they prove their performance, reliability and high quality. Carl Zeiss VisionMes lenses are developed for measuring tasks in industry and feature telecentric optics. They offer distortion-free image formations over the entire object field.

Carl Zeiss AG · Carl-Zeiss-Str. 22, 73446 Oberkochen, Germany,
Tel.: +49 7364 20 6175, lenses4industry@zeiss.de, www.zeiss.com/lenses4industry

GP-1

Office(s)
Docter Optics Express Glass Services,
Docter Optics GmbH
Straße der Deutschen Einheit 6
07819 Triptis
Germany
Tel.: +49 36482 88 173
Fax: +49 36482 88 174
egs@docteroptics.com

Management
Dr. Jan Hamkens, Managing Director of the Docter Optics group

Foundation
1982

Staff
251-500

Products
Optics, R&D

Applications
Inspection Piece Parts, Material Testing, Part Identification, Particle Analysis

Industries served
Automotive and Suppliers, Energy/Water/Solar Technology, Precision Engineering/Optics/Machine Vision

Regions served
Asia, Europe, Latin America, North America

DOCTER®OPTICS

Docter Optics GmbH
Mittelweg 29
07806 Neustadt an der Orla
Germany
Tel.: +49 36481 27 0
Fax: +49 36481 27 270
info@docteroptics.com
www.docteroptics.com

See our ad on page 15

SHL-1

About Docter Optics

Turning Ideas into Components

Docter Optics is an internationally recognized OEM partner of the optical industry and the world's leading supplier of advanced projection headlights for automotive applications. The company's spectrum of services extends along the entire value chain: The 330 employees of the four Docter Optics competence centers – Precision Glass Components, Optical Systems, Express Glass Services and Automotive Solutions – have the experience and expertise required to take an initial idea to production-ready design and deliver customer-driven solutions.

A Single-Source Supplier: Optical Systems

Docter Optics has been involved in the development and production of lenses for over 20 years. During that time, the bundled resources of four business units have made it possible to achieve unique synergistic effects that have made Docter Optics a recognized specialist in the development and production of optical systems (lenses). A further core competence lies in the development and production of customer-specific optomechanical and optoelectronic subassemblies. In these areas, Docter Optics serves companies involved in machine vision, biometrics and security technology.

In addition, the Docter Optics Optical Systems competence center supplies industry with its well-known lenses, including the Tevidon special-purpose CCD and CMOS lenses, Auto-Tessar reflection-free miniature HDR lenses and Stilar 2.8/8 super-wide-angle lenses for 1.2" sensor chips.

Quality plus Efficiency: Precision Glass Components

Proprietary Docter Optics precision-molding technology permits exceptionally economical production of optical components – including everything from aspheres, arrays and free-form lenses to light pipes, – for a wide range of applications even in very large quantities. Customers benefit from the services of highly qualified optical designers and process engineers with the experience and expertise it takes to design and produce customer-specific optical components to meet virtually any requirements. Customers can order components ranging in size from 5 to 165 mm in diameter. In addition, Docter Optics has advanced coating facilities that make it possible to coat all optical components to customer specifications.

Top-tier Services – Express Glass Services

The Docter Optics Express Glass Services business unit produces semi-finished and finished products of optical glass, prototypes, samples and one-of-a-kind components as well as pre-production or limited series for customers worldwide. This business unit also maintains a large inventory of special optical glasses of all types.

Distributor, Producer

CBC (Deutschland) GmbH, one of the biggest manufacturers of video surveillance systems, is successful with technical and economical convincing CCTV solutions worldwide. With its brand computar the company offers a broad bandwidth of functional strong and high-performance lenses. Particularly with the new mega pixel lenses CBC has specialized on industrial demands. The quality lenses convince with precision and high image quality and provide the best focus in every respect even with high requirements.

CBC (Deutschland) GmbH · Hansaallee 191 , 40549 Düsseldorf, Germany,
Tel.: +49 211 53067 0, Fax: +49 211 53067 180, info@cbc-de.com, www.cbc-de.com
D-2

Solution Provider

Chromasens designs and manufacturers customized image capturing systems for different branches of industry. The engineers and scientists of Chromasens work closely with customers to develop the most optimal system.Also, Chromasens designs and manufacturers standardized components like the color line scan camera Aleos or the LED line scan illumination Corona.

Chromasens GmbH · Max-Stromeyer-Str. 116, 78467 Konstanz, Germany,
Tel.: +49 7531 876 0, Fax: +49 7531 877 303, info@chromasens.de, www.chromasens.de
RV-3

Producer

Cognex Corporation designs, develops, manufactures, and markets machine vision sensors and systems. Cognex vision sensors are used in factories around the world to automate the manufacture of a wide range of items and to assure their quality. Cognex is the world's leader in the machine vision industry, having shipped more than 450,000 machine vision systems, since the company's founding in 1981. In addition to its corporate headquarters in Natick, Massachusetts, Cognex also has regional offices and distributors located throughout North America, Japan, Europe, Asia, and Latin America.

Cognex Germany, Inc. · Emmy-Noether-Str. 11, 76131 Karlsruhe, Germany,
Tel.: +49 721 6639 0, Fax: +49 721 6639 599, info@cognex.de, www.cognex.com
KA-3

Integrator, Solution Provider

CTMV offers business solutions for quality assurance in the field of automotive as well as for process optimization of manufacturing in the fields of metal working, extrusion and foil/glass production. Applications are focused on cutting-edge, sophisticated surface inspection of visually difficult materials like glass, metals, plastic tubes and foils, precise dimensional measurements mainly for the stamping industry as well as position detection of moving and/or complex parts for handling.

CTMV
Consulting Team Machine Vision

CTMV GmbH & Co. KG
Schwarzwaldstr. 7A
75173 Pforzheim
Germany
Tel.: +49 7231 566 177 200
Fax: +49 7231 566 177 299
info@ctmv.de
www.ctmv.de
PF-1

Distributor

Sales and Support for hightech cameras, framegrabbers and video-recording systems

Cosyco GmbH · Starnberger Weg 1A, 82110 Germering, Germany,
Tel.: +49 89 847087, Fax: +49 89 8416129, info@cosyco.de, www.cosyco.de
M-3

Producer

Datasensor Sp4, present on the international market for over 35 years, is a leader in the development production and commercialization of photoelectric devices for detection, safety, measurement and inspection in industrial automation.

Datasensor GmbH · Tegernseer Str. 75, 83624 Otterfing, Germany,
Tel.: +49 8024 90277 0, Fax: +49 8024 90277 99, info@datasensor.de, www.datasensor.com
M-4

Integrator

The company de Man GmbH is a manufacturer of factory automation machinery in the areas of materials handling, storage systems, robotics and flow of material. The company's range of business activities is very broad, as its origins lie in control and electrical engineering. Control and electrical engineering remains the company's core competency today and forms the foundation for the systems. The company was founded over 36 years ago.

de Man Industrie-Automation GmbH · Industriestr. 18, 33829 Borgholzhausen, Germany,
Tel.: +49 5425 9497-0, Fax: +49 5425 5774, info@deman.de, www.deman.de
GT-1

Solution Provider

The dhs Image Data Base is a modular software solution for "Digital Imaging" in microscopy, lab and QA applications. Software modules for image archiving, acquisition, processing, analysis and documentation are available. dhs furthermore provides hardware (cameras, frame grabber, PC systems, optics etc.) and services (individual programmings, installations, trainings, consulting etc.).The products are used in both stand-alone and complex network applications.

dhs Dietermann & Heuser Solution GmbH · Herborner Str. 50 , 35753 Greifenstein-Beilstein, Germany,
Tel.: +49 2779 9120 0, Fax: +49 2779 9120 99, vertrieb@dhssolution.com, www.dhssolution.com
GI-1

Producer

Manufacturer of high precision measurement machines, mainly 3D-multi-sensor measuring machines, profile projectors, measuring projectors, microscopes, workshop microscopes, measuring microscopes, coordinate measuring machines, crankshaft measuring machines, camshaft measuring machines, shaft measuring machines, optical measuring devices, VideoCAD, digital projectors, special measuring solutions.

Dr. Heinrich Schneider Messtechnik GmbH · Rothlay Mühle, 55545 Bad Kreuznach, Germany,
Tel.: +49 671 291 2, Fax: +49 671 291 200, info@dr-schneider.de, www.dr-schneider.de
MZ-1

Distributor, Producer

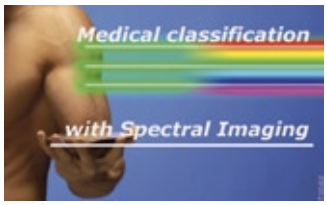
Edmund Optics is a leading producer of optics, imaging, and photonics technology. Supporting the R&D, electronics, semiconductor and biomedical markets around the globe; EO products are used in a variety of applications ranging from DNA sequencing to retinal eye scanning to high-speed factory automation. EO's state of the art manufacturing capabilities combined with its global distribution network has earned it the position of the world's largest supplier of off-the-shelf optical components.

Edmund optics | europe

Edmund Optics
Zur Giesserei 19-27
76227 Karlsruhe
Germany
Tel.: +49 721 6273 730
Fax: +49 721 6273 750
sales@edmundoptics.de
www.edmundoptics.de
KA-4

About CTR – Carinthian Tech Research AG

CTR is an industry-oriented contract R&D centre. We help companies to optimise existing procedures and develop new solutions in the field of automated process and quality control by applying the latest technological advances of sensor systems. This leads to greater reliability, smaller designs and thus higher profitability in production. Our expertise covers the complete R&D chain – feasibility studies, conception, tests, prototyping and individual system/product solutions. CTR has



been awarded over 45 patents and is certified according to ISO 9001/2000.

R&D Competences: Optical sensors, spectral imaging, spectroscopy, laser technology, image processing, x-ray, raman, terahertz spectroscopy, fluorescence spectroscopy, chemometry, statistical classification, software development, handling/automation technologies, optical simulation/design, microsystems, SAW sensor systems.

CTR – Carinthian Tech Research AG
Europastr. 4/1
9524 Villach
Austria
Tel.: +43 4242 56300
info@ctr.at
www.ctr.at

KL-1

Management
Simon Grasser, CFO,
simon.grasser@ctr.at
Raimund Leitner, R&D machine vision/spectral imaging,
raimund.leitner@ctr.at

Foundation
1997

Staff
11-50

Products
R&D

Applications
Character Recognition, High Speed Analysis, Inspection Piece Parts, Inspection Webbed Material, Part Identification, Particle Analysis, Robot Vision 2D, Robot Vision 3D, Thermography, Others

Industries served
Electronics/Semiconductors, Foodstuffs/Beverages, Glass/Ceramics, Medical Technology, Paper/Wood, Pharmaceuticals/Cosmetics/Chemicals, Plastics, Precision Engineering/Optics/Machine Vision, Other

Associations
Other

Regions served
Central Europe, Europe, North America, national

About Hochschule Darmstadt FB MN

The Institution

The department of optical technologies and machine vision ("Optotechnik und Bildverarbeitung") is part of the faculty of mathematics and natural sciences at Darmstadt University of Applied Sciences ("Hochschule Darmstadt"). The joint experience of 12 professors from various fields of optics, laser technology, image processing and optical metrology provides the background for profound work on cutting-edge research projects and an outstanding commitment to a modern study program, integrating optical technologies and machine vision.

Study Program

The Bachelor-program "Optotechnik und Bildverarbeitung" (7 semesters, B. Sc.) is focused on an integrated curriculum combining the disciplines of modern optics and machine vision. The graduate-course "Optotechnik und Bildverarbeitung" (3 semesters, M. Sc.) is a joint program of Darmstadt University of Applied Sciences and the corresponding institution in nearby Gießen-

Hochschule Darmstadt FB MN
Haardtring 100
64295 Darmstadt
Germany
Tel.:+49 6151 168651
heckenkamp@h-da.de
www.fbmn.h-da.de

DA-1

Friedberg. These courses, tailored to the needs of professionals in the field of optical technologies, are unique in Germany and provide a valuable qualification for work both in industry and in research institutes. Bachelor-and Master-theses usually result from internships in industry.

Research and development is actively pursued in close cooperation with industry in the following areas:

- Technical optics and optical engineering
- Optical metrology
- Laser-technology
- Image processing
- Optical design
- Micro- and fibre optics
- Lighting technology
- Machine Vision

Distributor

Duwe-3d AG has a long experience in the field of optical metrology and data analysis. As European partner of InnovMetric Software Inc., Duwe-3d AG is exclusive distributor in Germany, Austria and Switzerland. The Poly-Works software is market leader for the 3D-analysis of surfaces in the automotive and supplier industry. Its applications in combination with mobile, probing and optical systems are almost unlimited. Our team supports you with consulting, individual training and technical helpdesk.

Duwe-3d AG · Hundweilerstr. 15, 88131 Lindau (B), Germany,
Tel.: +49 8382 275 900, Fax: +49 8382 275 9029, info@duwe-3d.de, www.duwe-3d.de
RV-4

Solution Provider

In the last 20 years EHR has successfully established itself as a supplier of high-quality optical solutions in the market for metrology, testing and image analysis systems.We place value on the quality, continuity and sustainability of our products and services and do everything to meet the needs of the market in every respect. With our departments for planning, software development, electronic development and assembly we cover all our customers interests reliably and flexibly.The flexibility at EHR with regards to the special needs of our customers from different branches of industry plays a crucial role and is the basis of our success to date, which is also confirmed by the continual growth of EHR.

EHR GmbH · Wittumstr. 10, 75181 Pforzheim, Germany,
Tel.: +49 7231 9731 0, vision@ehr.de, www.EHR.de
PF-2

Producer

Eltec Elektronik develops and markets high-quality components and innovative concepts for industrial image processing. The product portfolio comprises frame grabbers, intelligent cameras, and complex image processing systems for an extremely wide range of sectors and industrial applications. The modern vision solutions are applied for inspection purposes, quality control, and in transportation and safety technologies, etc. Our core competences in hardware and software together with deep understanding of complex system associations are the basis for technical innovations and economical solutions.

Eltec Elektronik AG · Galileo-Galilei-Str. 11, 55129 Mainz, Germany,
Tel.: +49 6131 918 100, Fax: +49 6131 918 195, info@eltec.com, www.eltec.com
MZ-2

Distributor, Producer, Solution Provider

Producer of color-, laser-, optosensors and technical endoscopes. We solve vision applications by our PAV-Vision system. 2D Code Reader & LED-light sources for camera applications are in our program. We are distributor for Tattile (Italy). Cameras like Giga Ethernet-, Camera link-Cameras, Embedded Cameras, where the customer can solve his own application, are in our program. BW & color cameras with highest resolution/live cameras.

Eltrotec Sensor GmbH · Heinkelstr. 2, 73066 Uhlingen, Germany,
Tel.: +49 7161 98872 300, Fax: +49 7161 98872 303, info@eltrotec.com, www.eltrotec.com
S-2

Association

The EMVA has more than 114 members representing 20 nations. Its aim is to promote the development and use of machine vision technology and to support the interests of its members – machine vision companies, research institutions and national machine vision associations. EMVA focuses on standardization, statistics, the annual EMVA Business Conference and other networking events, public relations and marketing.

emva
european machine vision association

EMVA – European Machine Vision Association
Lyoner Str. 18
60528 Frankfurt
Germany
Tel.: +49 69 6603 1466
Fax: +49 69 6603 2466
info@emva.org
www.emva.org
F-2

Producer

Manufacturing of Megapixel Cameras, Custom Camera Design, FPGA-Design, Electronic Design.

Entner Electronics · Sigmund-Nachbauer-Str. 10, 06830 Rankweil, Austria,
Tel.: +43 5522 75717 0, Fax: +43 5522 75717 4, thomas.entner@entner-letcronics.com,
www.entner-electronics.com
G-2

Solution Provider

Various camera systems for the inspection of web surfaces (film, foil, aluminum, paper, textiles) and 100 % print inspection systems.

Erhardt+Leimer GmbH · P.O. Box 10 15 40, 86136 Augsburg, Germany,
Tel.: +49 821 2435 0, Fax: +49 821 2435 682, info@erhardt-leimer.com, www.erhardt-leimer.com
A-2

Distributor

CCD/CMOS sensors and cameras, customized sensor developments, filters, peltier elements, lenses, thermoelectrical coolings.

Eureca Messtechnik GmbH · Eupener Str. 150, 50933 Köln, Germany,
Tel.: +49 221 430 823 90, Fax: +49 221 430 823 94, info@eureca.de, www.eureca.de
K-2

Producer

Producer of smart cameras for image processing including graphically programmable software:

- EyeSpector systems, standard machine vision systems for optical quality control and measurement technique
- 3D Eye systems, standard systems for 3D evaluation and robot vision
- PC Eye systems, standard systems for optical quality control
- EyeView presentation of multi-camera systems for monitoring
- EyeSave data transfer to SAP, ORACLE, SQL and more

EVT Eye Vision Technology GmbH · Haid-und-Neu-Str. 7, 76131 Karlsruhe, Germany,
Tel.: +49 721 62690582, Fax: +49 721 62690596, sales@evt-web.com, www.evt-web.com
KA-5

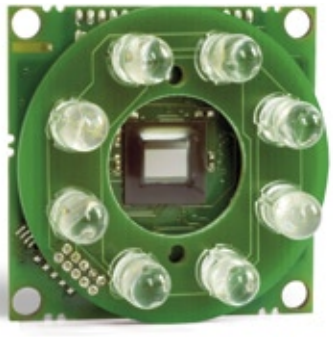
Producer

The Faseroptik Henning GmbH occupies with the integration of Light Technology and Optoelectronics based on light guides on all technical fields. Development and manufacture of customer specific component assembliesFibre-optic assemblies in special areasMicro-optics optical calculations energy & irradiation pathsElectronics circuit board layout & assembly softwareMechanics mechanical Prototypes – Zero-series – Series

Faseroptik Henning GmbH

Faseroptik Henning GmbH
Neumarkter Str. 29
90584 Allersberg
Germany
Tel.: +49 9176 58 0
Fax: +49 9176 58 70
kontakt@faseroptik-henning.de
www.faseroptik-henning.de
N-2

About Framos



For nearly 30 years, Framos Imaging Solutions serves customers in the field of image processing. We are driven to 'teach machines to see' and are able to offer a comprehensive range of imaging components like imaging sensors, camera modules, cameras, and peripherals. As a knowledgeable partner we not only provide technical support but can as well offer camera development services and imaging solution tailored to your application needs.
In our offices in Germany, Great Britain, France and Italy more than 40 associates look forward to helping you. By fostering an open and trusting enterprise culture Framos strives to continuously offer you innovative and cost efficient solutions in imaging.

Framos GmbH
Zugspitzstr. 5, Haus C
82049 Pullach
Germany
Tel.: +49 89 710667 0
Fax: +49 89 710667 66
info@framos.eu
www.framos.eu

M-5

See our ad on page 95

Management
CEO: Dr. Andreas Franz

Foundation
1981

Staff
11-50

Products
Cameras, Interfaces/Cables/Peripherals, Lighting Equipment, Optics, Software

Applications
Character Recognition, High Speed Analysis, Inspection Piece Parts, Metrology 2D, Metrology 3D, Part Identification, Robot Vision 2D, Robot Vision 3D, Symbol Recognition

Industries served
Automotive and Suppliers, Energy/Water/Solar Technology, Glass/Ceramics, Mechanical Engineering/Line Building, Medical Technology, Metal, Packaging, Paper/Wood, Pharmaceuticals/Cosmetics/Chemicals, Plastics, Precision Engineering/Optics/Machine Vision, Traffic/Logistics

Regions served
Asia, Europe, North America, national

Associations
EMVA, VDMA

Companies represented
Sony, Aptina, Pleora, Lumenera, Toshiba Teli, Sunex, Northwire, Pentax

About Fujinon

Fujinon is one of the foremost pioneers in the development of optical technology. Based on continuous research, long experience and leading quality Fujinon is able to provide products of the highest standard in the world.

Special tasks in image processing require a special lens and Fujinon offers the appropriate solution for almost every application. Whether with a high resolution of 5 megapixels or with 1.5 megapixels in fixed focal lengths, as zoom lenses or fisheye lenses, for 3 CCD cameras or UV optics - each model is characterized by first-class Fujinon quality: high resolution and precise optics with minimized distortion for optimal image quality. The compact design also makes it very easy to incorporate these lenses into your existing system.

Fujinon (Europe) GmbH
Halskestr. 4
47877 Willich
Germany
Tel.: +49 2154 924 0
Fax: +49 2154 924 139
cctv@fujinon.de
www.fujinon.de

D-3

See our ad on page 84

Foundation
1944

Staff
101-250

Products
Optics

Applications
Character Recognition, High Speed Analysis, Inspection Piece Parts, Metrology 2D, Metrology 3D, Part Identification, Robot Vision 2D, Robot Vision 3D, Symbol Recognition

Industries served
Automotive and Suppliers, Energy/Water/Solar Technology, Medical Technology, Packaging, Precision Engineering/Optics/Machine Vision, Traffic/Logistics

Regions served
Africa, Central Europe, EMEA, Europe

Producer

Falcon supplies LED-lightings for machine visions.

Falcon LED Lighting Ltd. · Fasanenweg 7, 74254 Offenau, Germany,
Tel.: +49 7136 9686 0, Fax: +49 7136 9686 10, info@falcon-led.de, www.falcon-lighting.de S-3

Producer

Festo AG & Co. KG, a leading provider of automation technology solutions, offers a tailor made range of vision systems: High-speed-cameras for optimisation of fast motion sequences as well as intelligent line- and area-scan cameras for position detection of parts, 2D quality inspection, Barcode and Data-Matrix-Code reading and OCR. The cameras comprise a complete PLC according to IEC 61131-3 standard as well as Ethernet and CAN interfaces and 24V I/Os to communicate with higher order PLCs.

Festo AG & Co. KG · Ruiter Str. 82, 73734 Esslingen, Germany,
Tel.: +49 180 3033000, service_international@de.festo.com, www.festo.com S-4

Integrator, Solution Provider

FiberVision GmbH was founded in 1995 as a spin-off of RWTH Aachen University. Today, FiberVision is a full scope machine vision supplier. The engineers and scientists develop and build optical measurement, positioning and test systems for industrial use. Be it a configurable Smart Camera system for manifold use or a PC based multi camera system for a special task: FiberVision makes the access to complex technologies easy by providing user interfaces for intuitive use.

FiberVision GmbH · Jens-Otto-Krag-Str. 11, 52146 Würselen, Germany,
Tel.: +49 2405 4548 0, Fax: +49 2405 4548 14, info@fibervision.de, www.fibervision.de K-3

Producer, Solution Provider

Fisba Optik is a world leader in optical systems, instruments and components. But we are far more than just a manufacturer of optics. We work closely with our customers to develop solutions that deliver both technical and economic success. Fisba unites all aspects of optical expertise and expert knowledge of many disciplines under one roof. Optic designers and engineers, backed by specialists in physics and coating technology, develop, analyze and optimize optic systems for the entire spectral range from UV to NIR – integrated and sustainable.

Fisba Optik AG · Rorschacherstr. 268, 09016 St. Gallen, Switzerland,
Tel.: +41 71 282 3131, Fax: +41 71 282 3130, info@fisba.ch, www.fisba.com SG-1

Producer

Surface Metrology Systems.

FRT, Fries Research & Technology GmbH · Friedrich-Ebert-Str., 51429 Bergisch Gladbach, Germany,
Tel.: +49 2204 2430, Fax: +49 2204 2431, info@frt-gmbh.com, www.frt-gmbh.com K-4

Integrator, Solution Provider

Gefasoft develops, manufactures and distributes innovative machine vision systems and complete assembly and measuring machines for the medical, automotive, electronic and semiconductor industry. Gefasoft also developed a library of 3D machine vision algorithms and data processing tools, targeted to the requirements of volume production. The 3D inspection system is integrated into the production line.

Gefasoft GmbH · Donaustaufer Str. 115, 93059 Regensburg, Germany,
Tel.: +49 941 799 96 0, Fax: +49 941 799 96 66, info@gefasoft.com, www.gefasoft.com R-1

Producer

Inspection and reverse engineering of measurement data. alignment, GD&T, RPS and 321, reporting, surfacing. Quality control and inspection, reverse engineering, initial sample test reports.

Geomagic GmbH · Leibnizstr. 51, 70193 Stuttgart, Germany,
Tel.: +49 178 7767 887, Fax: +1 919 474 0216, europe@geomagic.com, www.geomagic.com S-5

Media

GIT publishing house is part of the John Wiley & Sons publishing group, doing business all over the world. As a modern specialized publishing house we focus on what we are particularly good at: Target group orientated communication for decision makers and opinion leaders in the fields of chemistry, the pharmaceutical industry, biotechnology, healthcare, automation and security. Be it print, corporate publishing, direct marketing, events or online: We offer the whole spectrum of high-quality media and services – all from a single source and cross-medial, of course. After the match is before the match. This is our driving force. Together with our customers we develop ground-breaking and creative solutions day by day. Solutions which may turn out to be different.

GIT VERLAG
A Wiley Company

GIT Verlag GmbH & Co. KG
Rösslerstr. 90
64293 Darmstadt
Germany
Tel.: +49 6151 8090 0
Fax: +49 6151 8090 146
info@gitverlag.com
www.gitverlag.com DA-2

Solution Provider

Graphikon develops and manufactures complete inspection solutions for inline and offline quality control in the production process. With G/Inspect, Graphikon provides a modular system for general inspection tasks in the fields of manufacture, assembly and logistics. The product groups G/Solar, G/Wafer and G/Glas are systems specially geared towards the requirements of our most important markets, for development of inspection solutions composed of scaleable components and assemblies.

Graphikon GmbH · Mandelstr. 16, 10409 Berlin, Germany,
Tel.: +49 30 4210 4777, Fax: +49 30 4210 4750, sales@graphikon.de, www.graphikon.de B-2

Producer

Hamamatsu Photonics is a worldwide leading manufacturer of opto-electronic components and systems. Among others we offer sensors and systems for spectroscopy (including ultra fast), scientific- grade cameras, beam monitoring solutions, photon counting detectors and systems, photomultipliers, photodiodes, IR detectors.

HAMAMATSU
PHOTON IS OUR BUSINESS

Hamamatsu Photonics Deutschland GmbH
Arzbergerstr. 10
82211 Herrsching
Germany
Tel.: +49 8152 375 0
Fax: +49 8152 2658
info@hamamatsu.de
www.hamamatsu.de M-6

Producer, Research Facility

Development and production of smart cameras and LED-Light-Systems for machine vision. Development and production of Hard- and Software for machine vision. Applications and video electronics circuit board assembly, test and electronic device assembly.

hema electronic GmbH · Roentgenstr. 31, 73431 Aalen, Germany,
Tel.: +49 7361 9495 0, Fax: +49 7361 9495 45, info@hema.de, www.hema.de
S-6

Solution Provider

HGV supplies scaleable turnkey machine vision solutions for all kinds of quality inspection: Flexible measurement systems (FMS) with robots, in-line-measurement, process control, robot guiding, assembly control, part handling (pick & place), surface inspection, sorting & identification.

HGV Vosseler GmbH & Co. KG · An der Lehmgrube 9, 74613 Oehringen, Germany,
Tel.: +49 7941 9100 0, Fax: +49 7941 9100 50, info@hgv.de, www.hgv.de
S-7

Producer

Holoeye Photonics AG and its USsubsidiary, Holoeye Corp., are providing services and products in the fields of diffractive optics (DOE), spatial light modulation (SLM) and LCOS microdisplay components. Holoeye offers design and production services of diffractive micro- optical elements, Spatial Light Modulators (SLM) which are based on high-resolution translucent or reflective microdisplays and a great variety of high resolution LCOS microdisplay types and products.

Holoeye Photonics AG · Albert-Einstein-Str. 14, 12489 Berlin, Germany,
Tel.: +49 30 6392 3660, Fax: +49 30 6392 3662, contact@holoeye.com, www.holoeye.com
B-3

Producer, Solution Provider

IB/E Optics is service provider and producer for customized optics in the area of imaging and illumination. We are your partner for industrial customized solutions of imaging optics, illumination systems and machine vision applications. Beside developing and construction we also offer the complete manufacturing of prototypes and small series. Our own CNC-manufacturing allows a rapid realization and flexibility for customized solutions.

IB/E Optics Ing.-Büro Klaus Eckerl · Industriestr. 6, 94116 Hutthurm, Germany,
Tel.: +49 8505 3222, Fax: +49 8505 3400, ibe@ibe-optics.com, www.ibe-optics.com
PA-2

Producer

Since 1998 iiM develops and produces a constantly growing selection of LED lighting with highest functionality and performance. Luminous efficiency, design and industrial fitness are thereby important criteria. Ring- and arealights, darkfield lights, spots, coaxial- and domelights are available as static or flashed variants in different sizes and light colors. A large spectrum of diffusers and Fresnel lenses completes the product range. As engaged partner for our customers we develop and produce also special lighting according to their requirements.

iiM MEASUREMENT ENGINEERING

iiM AG
Auf der Höhe 1
98617 Meiningen
Germany
Tel.: +49 3693 88585 0
Fax: +49 3693 88585 11
info@iimag.de
www.iimag.de
EF-1

Integrator

In den Bereichen Automatisierungstechnik und industrielle Bildverarbeitung bieten wir Ihnen ganzheitliche und individuell auf Ihre Bedürfnisse zugeschnittene Lösungen an, die wir gemeinsam mit Ihnen erarbeiten. Tiefe Kenntnisse der branchenspezifischen Anforderungen sowie langjährige praktische Erfahrungen und produktive BV Lösungen haben wir in den Bereichen
• Automotive • Solar • Pharma • Verpackung • Elektro • Druck

i-mation GmbH · Neckartal 234, 78628 Rottweil, Germany,
Tel.: +49 741 94 22 86 00, info@i-mation.de, www.i-mation.de
KN-1

Producer

Development and manufacture of high-quality solutions for infrared temperature measurement (sensor, software, mechanical integration etc.), both in single point measurement and thermal imaging.

Impac Infrared · Kleyerstr. 90, 60236 Frankfurt/Main, Germany,
Tel.: +49 69 97373 0, Fax: +49 69 97373 167, info@impacinfrared.com, www.impacinfrared.com
F-3

Solution Provider

Impuls GmbH creates products for scientific image processing and image analysis as well as machine vision on the PC. The products are sold worldwide to end users as well as OEMs, VARs and system houses that create customized solutions around the Impuls products.Impuls GmbH also carries out custom software development projects in the field of image processing and image analysis for markets such as life sciences and machine vision.

Impuls GmbH · Carl-Benz-Str. 13, 82205 Gilching, Germany,
Tel.: +49 8105 773640, Fax: +49 8105 773642, sales@impuls-imaging.com, www.impuls-imaging.com
M-7

Solution Provider

in-situ GmbH is a growing company with more than 20 years experience in the field of machine vision.We specialize in industrial, medical and scientific applications offering image processing systems in a broad range of products, as well as special developments in hardware and software. Our main focus is turn-key systems for 2D and 3D surface inspection, optical 2D and 3D measurement systems, inline measurement systems, robot guiding, part handling (pick & place), code reading and verification, pharma inspection applications.

in-situ GmbH
Mühlweg 2a
82054 Sauerlach
Germany
Tel.: +49 8104 6482 30
Fax: +49 8104 6482 43
vision@in-situ.de
www.in-situ.de
M-8

Producer

Infinity Photo-Optical company, headquartered in Boulder, Colorado, USA, also has a Sales Office in Göttingen, Germany, which serves the EU and all European countries. Infinity manufactures long-distance microscopes, continuously-focusable microscopes, macro systems, internal-focusing devices and other lenses for industrial inspection, process/product monitoring, machine vision, QC, advanced imaging, non-contact gauging/inspection and laser/biomedical research.

Infinity Photo-Optical GmbH · Hans-Böckler-Str. 10a, 37079 Göttingen, Germany,
Tel.: +49 551 49957 0, Fax: +49 551 49957 10, info@infinity-de.com, www.infinity-de.com GÖ-1

Media

INSPECT (circulation print: 20,000, circulation ePaper: 13,500) is the leading European magazine for machine vision and optical metrology. It is read across all industries by direct and indirect decision-makers involved in the application and procurement of these components, products and technologies.The three regular sections of Vision, Automation and Control structure the contents into the fields of components and technologies, turn-key systems and applications, and material testing and measuring instruments. Up-to-date reports, hot topics, trade show previews and reviews, as well as interviews with the industry leaders complement the expert topics, application reports and product information.The INSPECT is the publication where the reader can find the best overview, the most important suppliers, and the relevant information, ranging from fundamental knowledge to specialist.

INSPECT
Roesslerstr. 90
64293 Darmstadt
Germany
Tel.: +49 8090 141
Fax: +49 8090 144
contact@inspect-online.com
www.inspect-online.com DA-3

Producer

Ircam is a German manufacturer of advanced IR cameras and systems for IR imaging and thermography. Ircam offers the dual-band and dual-color IR camera series Ircam Geminis for synchronous, pixel-registered acquisition in two bands (MWIR & LWIR) or two small spectral ranges (MWIR & MWIR). Other camera series are the high-speed Ircam Velox, the scientific Ircam Equus, the Ircam Taurus and the uncooled Ircam Caleo. All models can be delivered with MIO measurement interface, filter wheel, motor focus and Gigabit Ethernet.

Ircam GmbH · Nürnberger Str. 71, 91052 Erlangen, Germany,
Tel.: +49 9131 970098 0, Fax: +49 9131 970098 99, info@ircam.de, www.ircam.de N-3

Distributor, Producer, Solution Provider

IS – Imaging Solutions GmbH is focused on sales and service of digital highspeed and machine vision camera systems. Based on our strategic partnerships with leading brand companies in the digital imaging market, standard solutions as well as custom-made solutions are developed and realized in-house. A wide range of corresponding accessories allows to cover complet customer demands. IS – Imaging Solutions provides entire and cost-effective imaging solutions.

IS – Imaging Solutions GmbH
Arbachtalstr. 6
72800 Eningen
Germany
Tel.: +49 7121 680853 1
Fax: +49 7121 680853 9
info@imaging-solutions.de
www.imaging-solutions.de S-8

Consultant

Based on 20 years of experience in the vision industry and a broad international network, Jansen C.E.O. provides support in the following areas: inter/national joint ventures and cooperations, mergers & acquisitions, strategic marketing, market data research and internal structure and process optimization. All services, consulting and coaching are tailored to the individual requirements of the company or the entrepreneur.

JANSEN C. E. O.
Consulting – Execution – Optimization

Jansen C.E.O.
P.O. Box 1148
64629 Heppenheim
Germany
Tel.: +49 178 1755972
jansen@jansen-ceo.com
www.jansen-ceo.com DA-4

Producer

Jenoptik's Digital Imaging Business Unit offers optimized solutions for requirements in all contrast methods light microscopy. For applications in science & industry ProgRes CMOS cameras, CCD Routine cameras & CCD Research cameras are available. The image acquisition software ProgRes CapturePro combines intuitive and easy operation with comprehensive functionality. For system integrators we provide compact and versatile imaging modules for implementation in special system solutions.

Jenoptik Laser, Optik, Systeme GmbH · Göschwitzer Str. 25, 07739 Jena, Germany,
Tel.: +49 3641 65 3083, Fax: +49 3641 65 2144, progres@jenoptik.com, www.jenoptik.com/progres J-2

Producer

Plastics in Sensor TechnologyPolymer optical systems and components are used in sectors like classical industrial sensor technology, industrial image processing, measurement technology and in the consumer sector. Producing optical precision mechanical parts and devices of plastics offer a variety of innovative and constructional solutions for a convenient price performance ratio of the product and module.

Jenoptik Polymer Systems GmbH · Am Sandberg 2, 07819 Triptis, Germany,
Tel.: +49 36482 45 182, Fax: +49 36482 45 226, dana.rudolph@jenoptik-ps.de, www.jenoptik-ps.com J-3

Producer

Jos. Schneider Optische Werke GmbH develops, manufactures and distributes optical and mechanical precision components, filters and assemblies for Machine Vision and other image processing applications. These premium optics solutions help system integrators and machine builders improve their image processing systems. Product portfolio: C-Mount lenses, Macro lenses, Zoom lenses, Telecentric lenses, Motorized lenses, VIS- SWIR- NIR- MIR-lenses, Industrial Filters, Illumination,Measurement equipment

Jos. Schneider Optische Werke GmbH · Ringstr. 132, 55543 Bad Kreuznach, Germany,
Tel.: +49 671 601 205, industrie@schneiderkreuznach.com, www.schneiderkreuznach.com MZ-3

Producer

Loglux i5 Camera Link and FireWire cameras in monochrome and color versions.

Kamera Werk Dresden Optronics GmbH · Bismarckstr. 57 , 01257 Dresden, Germany,
Tel.: +49 351 28 06 0, Fax: +49 351 28 06 392, info@kwdo.de, www.kwdo.de DD-1

Office(s)
IDS Imaging Development Systems
400 West Cummings Park, Suite 3400
01801 Woburn
MA
United States of America
Tel.: +1 781 787 0048
Fax: +1 781 287 1258
usasales@ids-imaging.com

Management
Juergen Hartmann, General Manager
Achim Terhoeven, Purchase Manager
Alexander Balz, R&D Manager

Foundation
1997

Staff
51-100

Products
Cameras, Consulting, Frame Grabber, Interfaces/Cables/Peripherals, Optics, R&D, Software

Applications
Character Recognition, Digitalization, Inspection Piece Parts, Inspection Webbed Material, Material Testing, Metrology 2D, Metrology 3D, Part Identification, Particle Analysis, Robot Vision 2D, Robot Vision 3D, Symbol Recognition

Industries served
Automotive and Suppliers, Electronics/Semiconductors, Energy/Water/Solar Technology, Foodstuffs/Beverages, Glass/Ceramics, Mechanical Engineering/Line Building, Medical Technology, Metal, Packaging, Paper/Wood, Pharmaceuticals/Cosmetics/Chemicals, Plastics, Precision Engineering/Optics/Machine Vision, Traffic/Logistics

Associations
AIA, EMVA, VDMA

Regions served
Asia, Europe, Latin America, North America, national

Companies represented
MVTec (Germany only)

IDS Imaging Development Systems GmbH
Dimbacher Str. 6-8
74182 Obersulm
Germany
Tel.: +49 7134 961 96 0
Fax:.+49 7134 961 96 99
info@ids-imaging.com
www.ids-imaging.com

See our ads on page 12, 13

HN-1

About IDS Imaging Development Systems

Cameras, Accessories and Support for Industrial Image Processing: Your Imagination Is Our Challenge
Committed to industrial image processing since its foundation in 1997, IDS Imaging Development Systems GmbH has been widely known for its development of frame grabbers. Today IDS offers a comprehensive range of USB and GigE based industrial cameras, accessories and software tools "made in Germany". The uEye camera series currently comprises over 100 model variants. They cater not only to the classical image processing markets, such as industrial automation and quality assurance, but also to the upcoming "new markets" of image processing, such as security technology and the non-industrial segment.

The uEye Industrial Camera Series
All uEye cameras boast an extremely compact design. The industrial cameras are available with high-quality CCD or CMOS sensors, with monochrome or color technology. The resolution ranges from 640 x 480 pixels to up to five megapixels. The uEye RE and uEye LE versions are optimized for their intended uses. RE if tough is not tough enough, LE – as little as possible, as much as necessary. The GigE uEye HE and the all new GigE uEye SE extend the broad range of USB cameras by powerful models for sophisticated, complex machine vision and compact and cost effective solutions for a wide range of image processing applications. Compact, small, powerful – with their design, with the mainstream bus technologies USB and GigE and the highresolution sensors, the uEye industrial cameras perfectly meet the demanding requirements of modern image processing.

Custom-Made Cameras for Special Requirements
Even though the uEye series features over 100 different models, not all the specific demands of OEM customers can be met at a satisfactory level by using the standard models. To accommodate these requirements, IDS also develops customized and project-related solutions.

Optimum Software Support – the Second Half of the Camera
The powerful uEye software development kit (SDK) forms the basis. Demo programs for an easy camera configuration allow finding the best settings without previously programming a single line of code. The source code of the demo programs offers developers a useful programming basis. Direct interfaces are additionally provided for many current image processing libraries, such as Common Vision Blox, Halcon or LabView and the new universal camera interface standard GenICam will achieve shortest integration times for image processing.

Professional Service
Competent services complement and complete the product portfolio. They include, for example, application consulting, support during system integration and the design- in phase, feasibility studies, product leasing, and software training. IDS has a staff of approx. 75 employees in the development, production, sales, marketing and support departments at its head office in Obersulm, Germany and its subsidiary IDS Inc. in Woburn, USA. The company is represented in almost all European countries as well as the Americas and Asia through exclusive distributors.

Integrator, Solution Provider

Optical Inspection Systems ensure your product quality. Also, they help to reduce production costs and to file your product quality history. Kdorf Automation develops and implements customized vision systems for quality control. We select the optimal hardware components such as camera systems and lighting equipment which make your application a reliable and cost efficient investment. We are experts in intelligent camera systems and also complex PC-based environments.

Kdorf Automation · Industrierring Ost 66 , 47906 Kempen, Germany,
Tel.: +49 2152 894 8033, Fax: +49 2152 894 8034, kontakt@kdorf.de, www.kdorf.de
D-4

Producer

As a global leader in embedded computer technology, Kontron supplies a diversified customer base of OEMs, system integrators and application providers. The company helps its customers to considerably reduce their time-to-market and to gain a competitive advantage with products including high-performance open computer platforms and systems, single board computers and human-machine interfaces. Kontron employs more than 2,600 people worldwide.

Kontron · Oskar-von-Miller-Str. 1 , 85386 Eching, Germany,
Tel.: +49 8165 77 777, Fax: +49 8165 77 279, sales@kontron.com, www.kontron.com
M-9

Media

Landesmesse Stuttgart organizes the Vision show in Stuttgart, Germany – world's leading machine vision show in the heart of Europe. Vision 2010 takes place from November 9 to 11. Companies from all over the world will present the latest machine vision technologies and applications for mechanical engineering, the automotive and electrical industries, medicine, telecommunications, the food industry and many other sectors of industry. Vision is a must-attend event for all users of machine vision.

VISION

Landesmesse Stuttgart GmbH
Messepiazza 1
70629 Stuttgart
Germany
Tel.: +49 711 18560 2541
Fax: +49 711 18560 2657
florian.niethammer@messe-stuttgart.de
www.vision-fair.de
S-9

Distributor, Producer

As a specialist supplier to the photonics market, Laser 2000 is committed to excellence in the quality of service and products that we provide to customers throughout Europe. Laser 2000 Business Unit "Image Processing & Machine Vision": To improve productivity and quality in industrial environments we support the increasing demand for photonics products. Our engineers assist customers in selecting the appropriate combination of light source, camera and software.

LASER 2000
The Future of Photonics

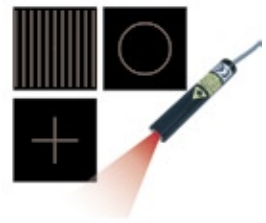
Laser 2000 GmbH
Argelsrieder Feld 14
82234 Wessling/Munich
Germany
Tel.: +49 8153 405 0
Fax: +49 8153 405 33
info@laser2000.de
www.laser2000.de
M-10

Distributor, Producer

Laser Components develops and manufactures laser modules and accessories for machine vision applications:

- Line lasers with homogeneous power distribution-Structured laser light as grids, multiple parallel lines, dot matrices
- Bandpass filters for machine vision applications- Protective eyewear for laser and LED applications

Your expert for laser illumination.



LASER COMPONENTS

Laser Components GmbH
Werner-von-Siemens-Str. 15
82140 Olching
Germany
Tel.: +49 8142 2864 0
Fax: +49 8142 2864 11
info@lasercomponents.com
www.lasercomponents.com
M-11

Producer

The Metrology Division offers the most complete range of equipment and software used in the metrology field today. Innovative products enable industrial customers to measure large components accurately to extreme tolerances and process the data directly in their CAD systems. Its product range includes laser trackers, image-processing systems, and high-precision industrial total stations, along with a broad spectrum of software that can communicate with all commercial CAD products.

Leica Geosystems AG Metrology Products · Moenchmattweg 5, 05035 Unterentfelden, Switzerland,
Tel.: +41 627376767, Fax: +41 627230734, info.metrology@leica-geosystems.com,
www.leica-geosystems.com/metrology
ZH-1

Producer

Leistungselektronik Jena GmbH (LEJ), this is more than 25 years of continuous research, product development and production in the field of electronic power supplies for gas discharge lamps, lamp housings and complete light sources also based on high power LED's. Additionally a selection of Xenon flashers in different versions is part of the product range.
The products are used in industrial applications as microscopy, machine vision, research and education, analytical products and solar simulation. For optimum profit of our customers all devices could be tailored to adapt to their systems.

LEJ
MORE THAN LIGHT

LEJ
Stockholmer Str. 5
07747 Jena
Germany
Tel.: +49 3641 3530 0
Fax: +49 3641 3530 70
info@lej.de
www.lej.de
J-4

Producer

Lemo designs and manufactures precision custom connection solutions. Lemo's high quality pushpull connectors are found in a variety of challenging application environments including medical, industrial control, test and measurement, audio-video, and telecommunications.

Lemo SA · 28 champs courbes, 01024 Ecublens, Switzerland,
Tel.: +41 21 695 16 00, Fax: +41 21 695 16 02, info@lemo.com, www.lemo.com
VD-1

About Kappa opto-electronics

Kappa opto-electronics GmbH is a global player operating for the last three decades in the fields of industrial cameras and image processing solutions.

Kappa is one of the few camera manufacturers with long time experience in extremely rugged cameras with above average signal quality. The Kappa portfolio not only guaranties the high quality of our standard products, but it is also the basis for the effective and efficient modification into a customer series that meets your requirements.

The Kappa Handbook presents our corporate portfolio, from mega pixel resolution to requirements management, from standards to customer series. We give you an overview of our vision technologies. Order your Kappa handbook now at www.kappa.de.

Kappa opto-electronics GmbH
Kleines Feld 6
37130 Gleichen
Germany
Tel.: +49 5508 974 0
Fax: +49 5508 974 109
info@kappa.de
www.kappa.de

See our ads on page 16, 17

GÖ-2

Office(s)

Kappa opto-electronics GmbH
France
Tel.: +33 561 27 82 81
Fax: +33 561 27 81 15
info@kappa-vision.fr

Kappa opto-electronics Inc.
United States of America
Tel.: +1 626 256 4343
Fax: +1 626 256 6484
info@kappa-vision.com

Management

Jürgen Haese, CEO
Alexander Berg,
Director of Sales and Marketing
Christian Koziol, Kappa USA,
Director of Sales
Christophe Tourné, Kappa France,
Key Account Manager

Foundation

1978

Staff

51-100

Products

Cameras, Consulting, R&D, Software, Other

Applications

Digitalization, Inspection Piece Parts, Inspection Webbed Material, Material Testing, Metrology 2D, Part Identification, Particle Analysis, Robot Vision 2D, Others

Industries served

Automotive and Suppliers, Electronics/Semiconductors, Energy/Water/Solar Technology, Foodstuffs/Beverages, Glass/Ceramics, Mechanical Engineering/Line Building, Medical Technology, Metal, Packaging, Paper/Wood, Pharmaceuticals/Cosmetics/Chemicals, Plastics, Precision Engineering/Optics/Machine Vision, Traffic/Logistics, Other

Associations

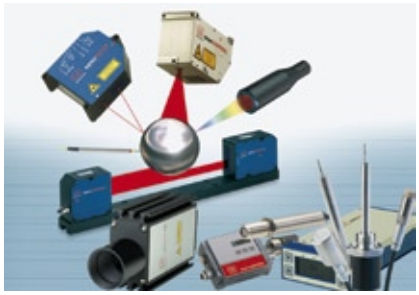
AIA, EMVA, VDMA, Other

Regions served

Asia, Central Europe, China, EMEA, Europe, North America, national

About Micro-Epsilon Messtechnik

Micro Epsilon is a worldwide known specialist for measurement of dimension and non-contact temperature. We have the broadest spectra for high quality and precise metrology, to provide you the best solution. The assortment covers inductive sensors, laser sensors, laser scanners, Thru-Beam systems, capacititve and confocal-chromatic sensors, eddy current sensors, image processing, draw wire sensors, non contact temperature sensors, test benches and OEM-sensors.



Micro-Epsilon Messtechnik GmbH
Königbacher Str. 15
94496 Ortenburg
Germany
Tel.:+49 8542 168 0
Fax: +49 8542 168 90
info@micro-epsilon.de
www.micro-epsilon.de

See our ad on page 3

PA-3

Office(s)

Micro-Epsilon America
United States of America
Tel.: +1 919 787 9707
Fax: +1 919 787 9706
me@micro-epsilon.com

Micro-Epsilon UK
United Kingdom
Tel.: +44 1513 556070
Fax: +44 1513 556075
info@micro-epsilon.co.uk

Micro-Epsilon France
France
Tel.: +33 1 69355200
Fax: +33 1 69419505
info@micro-epsilon.fr

Micro-Epsilon CH
Switzerland
Tel.: +41 71 2500838
Fax: +41 71 2500869
info@micro-epsilon.ch

Micro-Epsilon Czech Republik
Czech Republic
Tel.: +420 38 1213011
Fax: +420 38 1211060
info@micro-epsilon.cz

Management

Karl Wisspeintner, CEO
Johann Salzberger, CEO
Horst Bathke, Sales Manager

Foundation

1963

Staff

501-1000

Products

Software, Turn-key Systems, Other

Applications

High Speed Analysis, Metrology 2D, Metrology 3D, Robot Vision 2D, Robot Vision 3D, Thermography

Industries served

Automotive and Suppliers, Electronics/Semiconductors, Energy/Water/Solar Technology, Foodstuffs/Beverages, Glass/Ceramics, Mechanical Engineering/Line Building, Medical Technology, Metal, Packaging, Paper/Wood, Pharmaceuticals/Cosmetics/Chemicals, Plastics, Other

Regions served

Africa, Asia, Australia, Central Europe, China, EMEA, Europe, Japan, Latin America, North America

Distributor, Producer

Lensation GmbH provides one-stop-shopping for optics and lenses. We offer > 250 types of telecentric lenses from 8x to 500 mm diameter, stock about 150 types of M12x0.5 lenses (incl. 5 Megapixel versions), provide low distortion c-mounts up to 130 degrees angle and a complete choice of F1.0 and 1" lenses, Super highres Line scan lenses and customized optics, lenses and filters are in our portfolio too. We provide a free lens-search service.

Lensation GmbH · Unterer Dammweg 12, 76149 Karlsruhe, Germany,
Tel.: +49 721 6054 3390, Fax: +49 721 6054 3393, info@lensation.de, www.lensation.de
KA-6

Producer

For 30 years Leutron Vision has designed and manufactured a broad range of versatile imaging products that will serve most imaging needs. Today Leutron Vision has developed a broad selection of industrial quality CCD and CMOS cameras that feature Gigabit Ethernet (GigE Vision), USB2.0, Smart and Camera Link interfaces. Leutron image acquisition products support digital line scan and area scan cameras, as well as analog cameras. Leutron products are compatible with most industrial machine vision software libraries. We do custom designs and private labeling.

Leutron Vison AG · Industriestr. 57, 08152 Glattbrugg, Switzerland,
Tel.: +41 44 809 88 22, Fax: +41 44 809 88 29, intsales@leutron.com, www.leutron.com
ZH-2

Producer

For more than 40 years Leuze electronic is a leading manufacturer and developer of optoelectronic sensors, identification and machine vision systems, data transmission systems, as well as optoelectronic systems for safety at work and industrial automation. Leuze electronic is a member of the Leuze-group and world-wide represented. Strong-qualified field sales teams comprehensively serve the market. In combination with the customer support center, a maximum customer orientation is guaranteed.

Leuze electronic · In der Braike 1, 73277 Owen/Teck, Germany,
Tel.: +49 7021 573 0, Fax: +49 7021 573 199, info@leuze.de, www.leuze.de
S-10

Producer

Linos in brief

- Vast in-house expertise in optical design supported by the proprietary optical design software
- Highest-accuracy manufacturing technology for ultimate precision optical elements of any desired shape
- Leading-edge mounting technology for optical systems with outstanding performance
- Long-term customer support from development to after-sales service and spare part supply
- Flexible manufacturing to serve customer's demands

Linos Photonics GmbH & Co KG · Hans-Riedl-Str. 9, 85622 Feldkirchen (München), Germany,
Tel.: +49 89 255458 465, Fax: +49 89 255458 141, georg.zeitelhack@linos.de, www.linos.de
M-12

Distributor

MaxxVision is one of the leading Value-added Distributors in the field of industrial machine vision in Germany. With a wide array of products in cameras, 3D sensors, FPGA platforms, telecentric and hole inspection lenses we serve all needs and requirements in machine vision. Our ISO certified company delivers the components for all kind of machine vision solutions. The products are applied in sophisticated applications like automatic identification, industrial production, quality control, logistics, electronic control, science, video surveillance etc.

MaxxVision GmbH · Sigmaringer Str.121, 70567 Stuttgart, Germany,
Tel.: +49 711 9979 963, Fax: +49 711 9799 650, info@maxxvision.com, www.maxxvision.com
S-11

Producer

Solution Provider for motion analysis in digital image sequences, 2D and 3D.

Mikromak Service · Bernhard-Lichtenberg-Str. 10, 10407 Berlin, Germany,
Tel.: +49 30 42022 402, Fax: +49 30 42022 401, info@mikromak.com, www.mikromak.com
B-4

Producer

Mikrotron GmbH in Unterschleissheim near Munich develops, produces and sells optimized systems and components for industrial image processing; analog and digital frame grabbers, high-speed video systems and vision cameras for research, development and testing purposes. We also develop ready-to-use industrial electronics systems for large enterprises.

Mikrotron GmbH · Landshuter Str. 20-22, 85716 Unterschleißheim, Germany,
Tel.: +49 89 726342 00, Fax: +49 89 726342 99, info@mikrotron.de, www.mikrotron.de
M-13

Producer

Mitutoyo represents the most extensive range of products for length measuring: Coordinate Measuring Machines, Vision Measuring Systems, Form Measuring Instruments, Optical Measuring, Sensor Systems, Test Equipment and Seismometers, Digital Scales and DRO Systems, Small Tool Instruments and Data Management.

Mitutoyo Messgeräte GmbH · Borsigstr. 8-10, 41469 Neuss, Germany,
Tel.: +49 2137 102 0, Fax: +49 2137 102 301, info@mitutoyo.de, www.mitutoyo.de
D-5

Producer

For the machining industry we offer visual and electronic autocollimators for measuring straightness, flatness, and positioning accuracy of index tables in the machine tool industry. For the optical industry we offer interferometers for shape testing, goniometers, goniometer-spectrometers, visual and electronic autocollimators, collimators, testing telescopes, diopter telescopes, focometer, prism binoculars, cameras, and zoom lenses.

Moeller-Wedel Optical GmbH · Rosengarten 10, 22880 Wedel, Germany,
Tel.: +49 4103 93776 10, Fax: +49 4103 93776 60, info@moeller-wedel-optical.com,
www.moeller-wedel-optical.com
HH-3

Producer

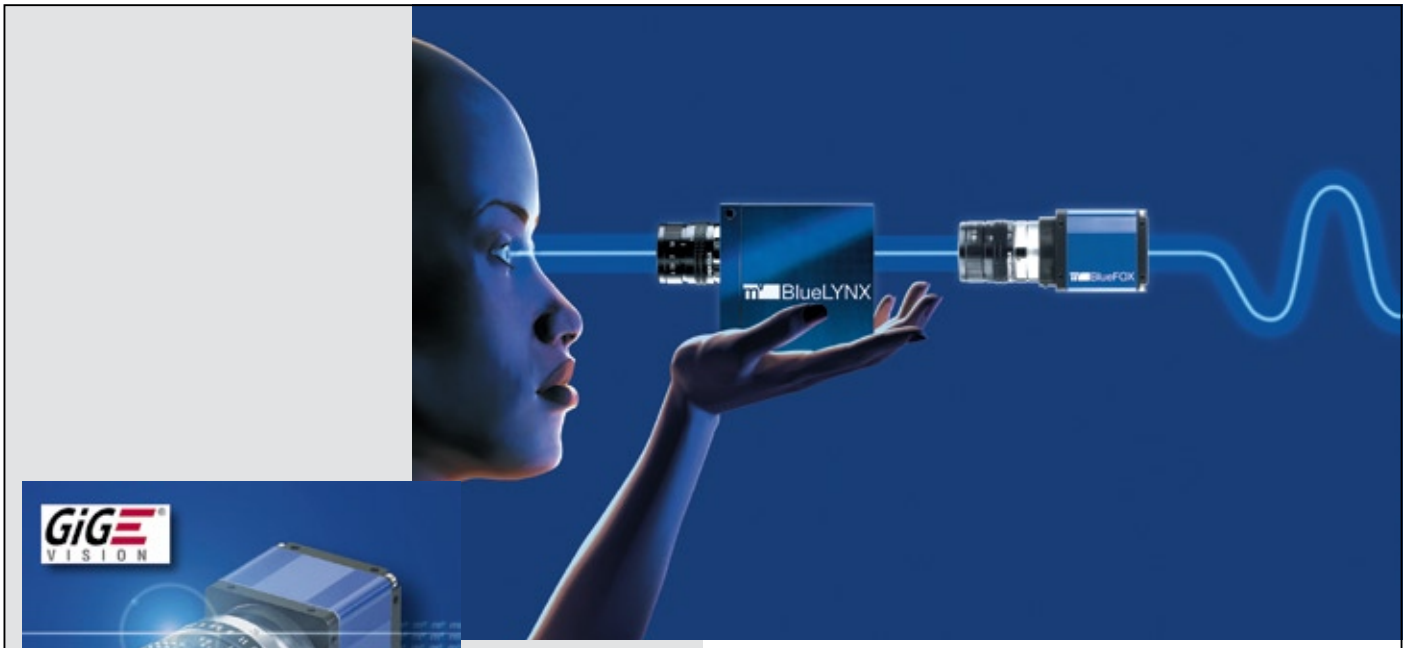
Efficient photonic solutions
Founded in 1995, m-u-t has grown into a high-tech company, with sales offices in Germany, the US, and China. Its core competence lies in Photonics, the combination of optics and electronics. m-u-t's strength is rapidly turning new ideas into marketable products. Our know-how can be applied to a wide range of products serving many industries. Besides producing custom solutions for specific customer requests, m-u-t products can be found in several high tech markets.

m-u-t AG
Am Marienhof 2
22880 Wedel
Germany
Tel.: +49 4103 9308 0
Fax: +49 4103 9308 99
info@mut-group.com
www.mut-group.com
HH-4

Integrator, Producer, Solution Provider

NanoFocus provides optoelectronic 3D measurement systems for the micro and nanometer ranges.

NanoFocus AG · Lindnerstr. 98, 46149 Oberhausen, Germany,
Tel.: +49 208 62000 0, Fax: +49 208 62000 99, info@nanofocus.de, www.nanofocus.com
OB-1



Office(s)
Matrix Vision France S.A.S.
France
Tel.: +33 1 30703033
Fax: +33 1 30708815
info-france@matrix-vision.com

Management
Gerhard Thullner, General Manager
Dietmar Unser, Sales Manager
Marcus Bleise, International Sales Manager

Foundation
1986

Staff
51-100

Products
Cameras, Frame Grabber, Lighting Equipment, Optics, Processors, R&D, Smart Cameras/Embedded Systems, Software, Vision Sensors

Applications
Digitalization, High Speed Analysis, Inspection Piece Parts, Inspection Webbed Material, Material Testing, Metrology 2D, Metrology 3D, Part Identification, Particle Analysis, Robot Vision 2D, Robot Vision 3D, Symbol Recognition, Thermography, Others

Industries served
Automotive and Suppliers, Electronics/Semiconductors, Energy/Water/Solar Technology, Foodstuffs/Beverages, Glass/Ceramics, Mechanical Engineering/Line Building, Medical Technology, Metal, Packaging, Paper/Wood, Pharmaceuticals/Cosmetics/Chemicals, Plastics, Precision Engineering/Optics/Machine Vision, Traffic/Logistics, Other

Associations
AIA, EMVA, Symop, VDMA, Other

Regions served
Africa, Asia, Australia, Central Europe, China, EMEA, Europe, Japan, Latin America, North America, national

Matrix Vision GmbH
Talstr. 16
71570 Oppenweiler
Germany
Tel.: +49 7191 9432 0
Fax: +49 7191 9432 288
info@matrix-vision.de
www.matrix-vision.de

See our ad on page 23

S-12

About Matrix Vision GmbH

Matrix Vision was founded in 1986 by W. Armingeon and G. Thullner. Since 1992, the focus of our product line has been exclusively on the industrial image processing market. With a current staff of about 50 employees, we develop, support and distribute our extensive range of products worldwide. The subsidiary company Matrix Vision France SAS, based in Paris, was formed in January 2003.

Markets and Applications

Matrix Vision develops for and in conjunction with its system partners components and solutions for various industrial sectors. We supply solutions for the demanding markets, i.e. quality control of high-speed manufacturing processes with a high information density such as in the automobile industry or in mechanical engineering. The fields of surveillance, robotics, electronics, chemicals, pharmaceuticals, foodstuffs, printing, photography, microscopy and medicine also place high demands on the hard- and software of image processing systems. Matrix Vision bears all this in mind with an extensive range of products.

Classical and Innovative Products

Our frame grabbers for handling color and gray scale image data with analog, digital or CameraLink interface will continue to defend their market position for a long time to come. FireWire solutions made by Matrix Vision complement this range of products. Our intelligent cameras mvBlueLynx, the USB cameras mvBlueFox, the GigE cameras mvBlueCougar and the PowerXCell accelerator boards cater for the trend towards integration of camera, acquisition, processing and networking applications. The mvImpact software for applications such as measurement, OCR/OCV, as well as pattern, barcode, data matrix, object and color recognition, optimally supports the hardware components.

Our Strong-Points

Beside an extensive range of standard products we offer custom-specific OEM solutions, which provide maximum utility for the user as a result of continuous development.

Producer

National Instruments is a leading machine vision and scientific imaging hardware and software tools provider. From inspecting automotive parts to researching advanced medicines, engineers and scientists use NI vision software and hardware to solve a diverse set of application challenges, faster and at a lower cost.

National Instruments Germany GmbH · Ganghoferstr. 70 b, 80339 München, Germany,
Tel.: +49 89 741 31 30, Fax: +49 89 714 60 35, info.germany@ni.com, www.ni.com/vision
M-14

Producer, Solution Provider

Since 1993 NeuroCheck GmbH has been offering turn-key solutions for all fields of automated visual inspection. All these solutions are based on the software product NeuroCheck, which is developed in-house.

NeuroCheck GmbH · Neckarstr. 76/1, 71686 Remseck, Germany,
Tel.: +49 7146 8956 0, Fax: +49 7146 8956 29, info@neurocheck.com, www.neurocheck.com
S-13

Solution Provider

OBE offers products and services for the automatic inspection of technical and decorative surfaces under the brand name of trevista. trevista was specially developed for the 100 % inspection of shiny components. A wide range of surfaces such as turned, milled, ground, polished and electroplated surfaces can thus be safely and efficiently checked. Our spectrum ranges from components to integrated machine vision solutions for specific parts and finally up to complete automated inspection systems.

OBE Ohnmacht & Baumgärtner GmbH & Co. KG · Turnstr. 22, 75228 Ispringen, Germany,
Tel.: +49 7231 802 0, Fax: +49 7231 802 156, trevista@obe.de, www.trevista.net
S-14

Integrator

Octum is an experienced system integrator in the industrial machine vision sector and a Cognex Partner System Integrator (PSI). Since 1996, we have been supplying systems for inspection and identification of a wide range of parts for our target industries worldwide. We develop and implement customer-specific machine vision solutions based on technologies available and proven worldwide. We use both compact smart cameras for simple or decentralised inspection or identification tasks and PC-based multi-camera systems, e. g. for surface inspection, robot guidance or 3D inspection.

Octum GmbH · Renntalstr. 16, 74360 Ilsfeld, Germany,
Tel.: +49 7062 914 94 0, info@octum.de, www.octum.de
HN-2

Solution Provider

Since 1980, we have been a specialist developer and manufacturer of market leading Optomechatronic Modules, Components and Systems. We have delivered special plug and play solutions ranging from single vision components all the way to complex imaging systems. Thanks to our comprehensive in-house manufacturing capability, we are able to meet any production demand – from rapid single unit prototyping all the way to serial production. We will be pleased to assist you with any level of advice.

Opto Sonderbedarf · Lochhamer Schlag 14, 82166 Gräfelfing, Germany,
Tel.: +49 89 898055 0, Fax: +49 89 898055 18, info@opto.de, www.opto.de
M-15

Producer

Because of its ideal properties as a Lambertian reflector, OptoPolymer offers a broad range of optical applications. The diffuse reflecting base material is particularly processed PTFE and works in its optical characteristic as volume reflector.

OptoPolymer · Königsteinstr. 12, 80807 München, Germany,
Tel.: +49 89 35657183, Fax: +49 89 35657184, info@optopolymer.de, www.optopolymer.de
M-16

Machine Builder/OEM

Non-contact surface measurement: Roughness, Roundness, Waviness.

OptoSurf GmbH · Nobelstr. 9-13, 76275 Ettlingen, Germany,
Tel.: +49 7243 766 013, Fax: +49 7243 766 034, info@optosurf.com, www.optosurf.com
KA-7

Producer

Optronis develops, manufactures and distributes streak cameras and high-speed video cameras for scientific and industrial applications. Our high-end cameras can be used to capture ultra-fast phenomena. Our primary goal: to provide our customers with innovative solutions for fast optical measurements.

Optronis GmbH · Honsellstr. 8, 77694 Kehl, Germany,
Tel.: +49 7851 9126 0, Fax: +49 785 19126 10, info@optronis.com, www.optronis.com
OG-1

Producer, Solution Provider

High quality electronic and electromechanical components, automation solutions only experience can provide and that "extra" service and support are what characterize Panasonic Electric Works Deutschland GmbH. Our emphasis on service is underlined by over 100 employees at our technology centers in Holzkirchen, Karlsruhe (founded 2008) and Gera as well as numerous sales offices around Germany.

Panasonic Electric Works Deutschland GmbH · Rudolf-Diesel-Ring 2, 83607 Holzkirchen, Germany,
Tel.: +49 8024 648 0, Fax: +49 8024 648 555, info-de@eu.pewg.panasonic.com,
www.panasonic-electric-works.de
M-17

Producer

Panasonic Corporation is one of the World's largest manufacturers of consumer electronics. Panasonic System Solutions' mission as a group member of the Panasonic Co. is to use our expertise in digital AV and IT system solutions to provide the infrastructure for the ubiquitous network society. The Industrial and Medical Vision dep. offers a comprehensive range of micro camera equipment suitable for many applications including medical, industrial, live science and broadcast.

Panasonic Marketing Europe GmbH · Winsbergring 15, 22525 Hamburg, Germany,
Tel.: +49 40 8549 2606, Fax: +49 40 8549 2856, info.medicalvision@eu.panasonic.com,
pss.panasonic.eu/microcameras
HH-5

Producer

In 1987, PCO AG was founded with the objective to develop and to produce specialized fast and sensitive video camera systems, mainly for scientific applications. Meanwhile the product range of PCO cameras covers digital camera systems with high dynamic range, high resolution, high speed and low noise, which are sold in the scientific and industrial market all over the world. Currently PCO is one of the leading manufacturers of scientific cameras. Worldwide representatives, together with our own sales department and technical support assure that PCO keeps in touch with our customers and their needs.

PCO AG · Donaupark 11, 93309 Kelheim, Germany,
Tel.: +49 9441 2005 0, Fax: +49 9441 2005 20, info@pco.de, www.pco.de
R-2

Solution Provider

PCE offers a wide range of application- specific and well established systems for the control of pharmaceutical packaging. This range covers from simple control sensors to image processing used in complex applications such as Pharma Track & Trace. Thereby efficient image processing technology is embedded in an easy to handle user interface. The data acquired is available on all levels of process management. All systems comply with GMP standards.

Pharmacontrol Electronic GmbH · Gernsheimer Str. 2, 64673 Zwingenberg, Germany,
Tel.: +49 6251 8545 0, Fax: +49 6251 8545 111, info@pharmacontrol.de, info@pharmacontrol.de
F-4

About NET

NET GmbH is a manufacturer of high quality CCD and CMOS cameras for imaging solutions. The product line includes industrial and OEM board level cameras for a wide variety of applications in the industrial and medical field. The extensive range of vision cameras contains different interfaces like FOculus (IEEE1394), GimaGO (GigE) as well as iCube (USB2.0). NET offers an extensive range of board level cameras and camera heads as well as customized solutions.

Lenses, illumination and cable assemblies are offered as well. All of this products can be sourced either in Europe through NET or there wide distribution network as well as in the USA through NET USA and in Asia through NET Japan.

See our ad on page 75

NET GmbH
Lerchenberg 7
86923 Finning
Germany
Tel.: +49 8806 9234 0
Fax: +49 8806 9234 77
info@net-gmbh.com
www.net-gmbh.com

M-18

Office(s)
Japan
NET Japan Co., Ltd.
Tel.: +81 45 478 1020
Fax: +81 45 476 2423
info@net-japan.com

USA
NET USA, Inc.
Tel.: +1 219 934 9042
Fax: +1 219 934 9047
info@net-usa-inc.com

Management
Uwe Post, Director Sales & Marketing

Foundation
1996

Staff
11-50

Products
Cameras, Interfaces/Cables/Peripherals, Lighting Equipment, Optics

Applications
Character Recognition, Inspection Piece Parts, Inspection Webbed Material, Material Testing, Part Identification, Robot Vision 2D, Robot Vision 3D, Symbol Recognition

Industries served
Automotive and Suppliers, Energy/Water/Solar Technology, Glass/Ceramics, Mechanical Engineering/Line Building, Medical Technology, Metal, Packaging, Paper/Wood, Pharmaceuticals/Cosmetics/Chemicals, Plastics, Precision Engineering/Optics/Machine Vision

Associations
AIA , EMVA

Regions served
Africa, Asia, Australia, Central Europe, China, EMEA, Europe, Japan, Latin America, North America, national

Companies represented
V S Technology Corp.
Toshiba Teli Corp.

Producer

Photonfocus AG is a leading developer and manufacturer of high performance CMOS image sensor and camera technologies for the machine vision industry. Based on leading-edge, proprietary sensor designs, our products feature extremely high frame rates, high dynamic and extensive programmability for use in many industrial vision applications. Additional Photonfocus offers customized sensor and camera solutions and provides design-in support in vision system design.

Photonfocus AG · Bahnhofplatz 10, 08853 Lachen, Switzerland,
Tel.: +41 55 4510000, Fax: +41 55 4510001, sales@photonfocus.com, www.photonfocus.com

ZH-3

Distributor, Integrator, Producer, Solution Provider

plasmo Industrietechnik GmbH zählt international zu den führenden Unternehmen in der Qualitätssicherung mittels sensor- und kamerabasierten Lösungen für die produzierende Industrie. Die Tätigkeitsfelder liegen im Bereich der Laserleistungsmessung, Schweißprozessüberwachung, Schweißnahtgeometrievermessung, industriellen Bildverarbeitung und Analysesoftware für die Qualitätssicherung bis hin zu ausgedehnten Serviceangeboten. Das Expertenteam begleitet seine Kunden von der Definition der Prüfaufgabe bis hin zur Realisierung des Prüfsystems. 2003 mit Geschäftsaktivitäten gestartet, erwirtschaftete das nunmehr 20-köpfige Unternehmen mit Hauptsitz in Wien einen Umsatz von 1,8 Mio. €.

plasmo Industrietechnik GmbH · Dresdner Str. 81-85, 01200 Vienna, Austria,
Tel.: +43 1 236 2607 0, Fax: +43 1 236 2607 99, sales@plasmo.eu, www.plasmo.eu

V-1

Producer, Solution Provider

Phytec is developer and manufacturer of imaging hardware with a special focus on customer specific products. Based on ready-made single board computers and camera boards, Phytec offers an easy way to integrate digital imaging into serial products. Solutions can either be based on miniaturized microcontroller boards or standard-PC components.

Phytec Messtechnik GmbH · Robert-Koch-Str. 39, 55129 Mainz, Germany,
Tel.: +49 6131 9221 0, Fax: +49 6131 9221 33, info@phytec.de, www.phytec.de

MZ-4

Producer

POG Präzisionsoptik Gera develops, produces and distributes client- specific, optics for the whole spectral range. Founded in 1991 as MBO from the Carl Zeiss Group, POG today has three main product lines: a) customized and standard optical microstructures – reticles, scale, resolution and calibration targets, b) custom optical systems – from optics design to series production –, and c) custom high precision optical components from UV to IR.

POG Präzisionsoptik Gera · Gewerbepark Keplerstr. 35, 07549 Gera, Germany,
Tel.: +49 365 77393 0, Fax: +49 365 77393 29, info@pog.eu, www.pog.eu

EF-2

Integrator, Solution Provider

Inspection Machines

pi4_robotics GmbH · Gustav-Meyer-Allee 25, 13355 Berlin, Germany,
Tel.: +49 30 7009 694162, Fax: +49 30 7009 694 69, sales@pi4.de, www.pi4.de

B-5

Distributor

Illumination: Fiber-optics, Halogen cold light sources, Metal halide light sources, Xenon stroboscopes, LED lightheads and controllers. Lens: Standard CCTV lenses, Telecentric and macro lenses, System lenses. Camera: Analog and digital cameras, Matrix- and line-scan cameras, Cabling and signal transfer, copper cables, fiber-optic transmission for digital cameras Frame Grabber: Analog input, Digital input, FireWire IEEE 1394, Optional DSPs.

Polytec GmbH · Polytec-Platz 1-7, 76337 Waldbronn, Germany,
Tel.: +49 7243 604 0, Fax: +49 7243 699 44, info@polytec.de, www.polytec.de

KA-8

Producer

Point Grey Research, Inc. is a worldwide leader in the development of advanced digital camera technology products for machine vision, industrial imaging, and computer vision applications. A broad range of hardware, software and mechanical engineering skills has allowed Point Grey to successfully bring innovative and groundbreaking products to market. Since its founding in January of 1997, the company's approach to product pricing, quality control, and customer service has attracted thousands of customers worldwide.

POINT GREY

Point Grey Research GmbH
Schwieberdinger Str. 60
71636 Ludwigsburg
Germany
Tel.: +49 7141 488817 0
Fax: +49 7141 488817 99
eu-sales@ptgrey.com
www.ptgrey.com

S-15

Producer, Research Facility, Solution Provider

Leader in R&D in industrial automation and robotics, nanotechnology, quality control, image processing, process design automation.

Profactor GmbH · Am Stadtgut A2, 04407 Steyr, Austria,
Tel.: +43 7252 885 0, Fax: +43 7252 885 101, manfred.schaffrath@profactor.at, www.profactor.at

L-1

Producer, Solution Provider

Producer of image intensifiers, intensified cameras, special purpose cameras, detectors heads, subunits for low light and short-exposure applications. Engineering of customized products (single pieces, prototyping and series). Product Range: electrooptical short-gating units (down to 5ns), intensified and EMCCD cameras, x-ray cameras, open MCP detector systems, UV cameras with single photon detection, SIT replacement cameras, powerline inspection system, camera upgrades and fiber optical couplings.

Proxitronic Industries AG · Robert-Bosch-Str. 32b, 64625 Bensheim, Germany,
Tel.: +49 6251 1703 0, Fax: +49 6251 1703 90, imaging@proxitronic.com, www.proxitronic.com

F-5

Solution Provider

Quiss provides a wide selection of innovative systems for various inspection tasks in the fields of adhesive and sealant application, position detection and robot guidance as well as in the manufacture of metal packaging. Quiss systems detect and prevent manufacturing errors with utmost reliability, indicate weak points and help achieve continuous improvement in the production process. We are proud to serve our customers now for two decades in the area of industrial image processing.

Quiss GmbH · Lilienthalstr. 5, 82178 Puchheim, Germany,
Tel.: +49 89 894 590, Fax: +49 89 894 111, info@quiss.com, www.quiss.com

M-19

Distributor

Rauscher GmbH is a leading distributor for all imaging components, including software, area- and linescan cameras, frame grabbers, image-processing boards, smart cameras, embedded systems, optics, lighting and accessories. Rauscher GmbH combines distribution with high engineering competence. This enables all customers to efficiently develop and market their vision system.

Rauscher GmbH · Johann-G.-Gutenberg-Str. 20 , 82140 Olching, Germany,
Tel.: +49 8142 448 41 0, Fax: +49 8142 448 41 90, info@rauscher.de, www.rauscher.de

M-20

Integrator, Machine Builder/OEM, Solution Provider

We provide flexible robot solutions with vision technology for feeding bulkware parts to several different devices. With our installations users are able to install new parts for feeding in less than 30 minutes. Just come and see yourself…Our Robot-Solutions can be used for inserting parts into CNC machines, optical 100 % inspection of surface and measurements, marking of parts and further devices.Take action now and leave you competition way behind! Watch video samples now at our homepage.

rbc robotics · Werner von Siemens Str. 3, 65520 Bad Camberg, Germany,
Tel.: +49 6434 4733, info@rbc-robotics.de, www.rbc-robotics.de

WI-2

Integrator

2D and 3D inspection systemsOptical 3D measurement systemsHigh speed AOI systems

Rohwedder AG · Kesselbachstr. 1, 88697 Bermatingen, Germany,
Tel.: +49 75 44 502 100, michael.stoecker@rohwedder.com, www.rohwedder.com

M-21

Distributor

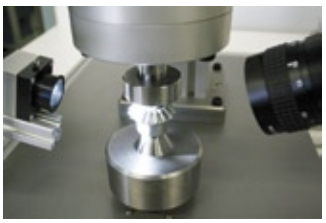
The Rubroeder GmbH Factory Automation offers systems for the PCB-, solar- and fuel-cell production as well as for semiconductorpackaging. Its systems for automated optical inspections by MVP acquire images "on-the-fly" and allow for solder-paste-, placement- and end-of-line inspections of PCBs. The 850-G system makes inspections of semiconductor packaging applications possible. It inspects paste, flux, the placement of die as well as epoxy.

Rubroeder GmbH Factory Automation · Theodor-Neizert-Str. 1, 56170 Bendorf, Germany,
Tel.: +49 2622 943 730, Fax: +49 2622 943 750, info@rubroeder.de, www.rubroeder.de

KO-1

Solution Provider

SAC offers system solutions for machine vision applications in the field of 2D and 3D. Besides specific solutions, SAC develops individually customers' applications and provides as well standard solutions. Together with the customers, SAC designs concepts for the machine vision's integration into the production process. SAC's efficient system solutions range among others from 3D inspection, toothing inspection, over assembly quality assurance to surface inspection



SAC
Sirius Advanced Cybernetics GmbH

SAC Sirius Advanced Cybernetics GmbH
Am Sandfeld 15
76149 Karlsruhe
Germany
Tel.: +49 721 60 543 000
Fax: +49 721 60 543 200
sales@sac-vision.net
www.sac-vision.net

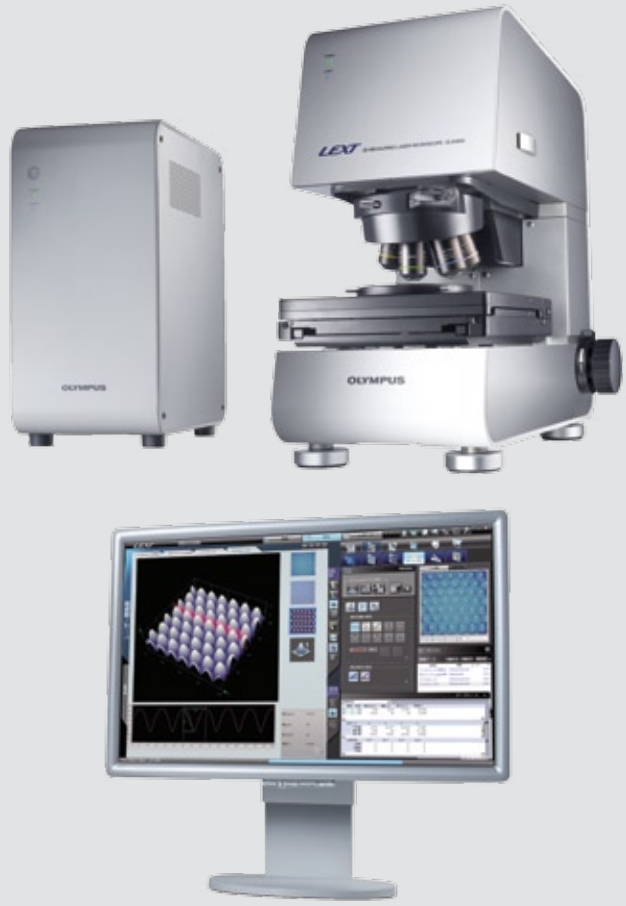
KA-9

Distributor

The Schaefer group with offices in Germany, France, Italy, Switzerland, Romania and Poland distributes scientific instruments in the field of nanotechnology, microtechnology and surface inspection all over Europe.Instruments like Atomic Force Microscopes (AFM), Optical Profilers (Interferometer, Confocal), Tribometers, X-ray tomography as well as Vacuum, Gasflow, Deposition rate and Magnetic field measuring devices are represented by Schaefer.

Schaefer Technologie GmbH · Robert-Bosch-Str. 31, 63225 Langen, Germany,
Tel.: +49 6103 300 980, Fax: +49 6103 300 9829, info@schaefer-tec.com, www.schaefer-tec.com

F-6



Management
Michael C. Woodford, Executive Managing Director, Olympus Europa Holding GmbH
Luke Calcraft, Managing Director, Olympus Europa Holding GmbH
Michael Czempiel, Director Sales & Marketing, Olympus Europa Holding GmbH
Esther Ahrent, Department Manager Marketing Communications, Olympus Europa Holding GmbH

Foundation
1963

Staff
> 5,000

Products
Cameras, Lighting Equipment, Microscopes, Optical Instruments, Optics, Software

Applications
Digitalization, Inspection Piece Parts, Material Testing, Metrology 2D, Metrology 3D, Part Identification, Particle Analysis

Industries served
Automotive and Suppliers, Electronics/Semiconductors, Energy/Water/Solar Technology, Foodstuffs/Beverages, Glass/Ceramics, Mechanical Engineering/Line Building, Medical Technology, Metal, Packaging, Pharmaceuticals/Cosmetics/Chemicals, Plastics, Precision Engineering/Optics/Machine Vision

Regions served
EMEA

Olympus Europa Holding GmbH
Wendenstr. 14–18
20097 Hamburg
Germany
Tel.: +49 40 237730
Fax: +49 40 237734647
microscopy@olympus-europa.com
www.microscopy.olympus.eu

HH-6

Olympus Life Science Europa

Olympus Microscopy: Meeting All Exacting Industrial Quality Requirements

For over 80 years, Olympus has been one of the world's leading manufacturers in the opto-digital industry. As one of the biggest and most respected providers of microscope systems, Olympus offers a comprehensive range of professional system solutions for all market requirements. These include entrylevel inspection microscopes to high-end system solutions enabling pioneering research and routine applications in materials science, as well as innovative imaging systems and information technology for all industrial applications. Furthermore, Olympus offers a wide range of microscopes and accessories for observing surfaces and analysing new materials and nanoparticles.

High Performance Microscope Systems

Microscopy is an indispensable tool for materials and industrial research and development. With progressive developments in the areas of digital photography and image processing, as well as analysis and archiving, the range of possible microscope applications has changed radically, especially in recent years. Modern manufacturing processes do not only demand the most professional and precise microscope system solutions, but users also expect the manufacturer to provide a reliable and first class service. To this end, Olympus develops custom software and hardware solutions for microscopical imaging, in which all components are optimally integrated. Olympus users also get total peace of mind with comprehensive service and support at all times. With its broad product spectrum, Olympus covers the requirements of all market areas. It provides models for routine tasks, highend system solutions for inspection and metrology, as well as devices for material science research applications.

Flexibility as Standard

Flexibility is always one of the first considerations in the design of all Olympus microscopes. From the top-quality inspection MX series upright microscopes to both routine use and sophisticated systems of the GX series inverted microscopes, there are no exceptions. Constantly evolving toward greater simplicity and higher precision, the peerless Olympus Lext provides near-UV cLSM capability for advanced metrology and fine surface profile applications.

All industrial level microscopes are equipped with infinity corrected optics and numerous ports. These enable components such as laser light sources, filters and cameras, to be integrated easily into the light path. For example, Olympus has developed two versatile illumination systems for its unique SZ2 and SZX2 industrial stereo microscope ranges. These lighting systems deliver uniform illumination over a large area and light up points of interest, providing an innovative and flexible approach to effective sample illumination, for all industrial and materials applications.

The User's Dividend

As a result of this attention to detail across the entire range, whatever Olympus microscope or imaging system is in-place, the user will experience the best possible images and functionality

Producer

Schäfter + Kirchhoff develops since over 40 years optomechanical and optoelectronic systems for research, aviation and space flight systems, medical technics and industrial applications. CCD line scan camera systems and laser beam sources with beam shaping optics have been developed and manufactured as own product lines since more than 20 years.

Schäfter + Kirchhoff GmbH · Kieler Str. 212, 22525 Hamburg, Germany,
Tel.: +49 40 85 39 97 0, Fax: +49 40 85 39 97 79, info@SuKHamburg.de, www.SuKHamburg.de HH-7

Distributor, Integrator, Solution Provider

Industrielle Bildverarbeitung, Lasermesstechnik, Robotik

Schoenherr Elektronik GmbH · Kurze Str. 18, 09577 Niederwiesa, Germany,
Tel.: +49 3726 79050, info@schoenherr-elektronik.com, www.schoenherr-elektronik.com x-x

Machine Builder/OEM, Solution Provider

Seidenader Vision GmbH has been developing and selling customized vision solutions, inspection systems and vision processors for all fields of industrial in-process quality inspection for almost 20 years. Seidenader Vision is part of the Seidenader Group with head office in Munich/ Germany and subsidiaries in USA and Belgium.

Seidenader Vision GmbH · Lilienthalstr. 8, 85570 Markt Schwaben, Germany,
Tel.: +49 8121 802 486, Fax: +49 8121 802 100, info@seidenader.de, www.seidenader.de M-22

Producer

Created in 1994, SensoPart is today one of the leading suppliers in industrial sensor technology. SensoPart develops, produces and sells sensors for industrial applications. The main focus is on optoelectronic sensors, particularly laser sensors as well as customised solutions. SensoPart currently employs 120 people. SensoPart regularly presents innovative products which distinguish themselves by their superior performance, high range of functions and user-friendly operation.

SensoPart Industriesensorik GmbH · Nägelseestr. 16, 79288 Gottenheim, Germany,
Tel.: +49766594769-0, info@sensopart.de, www.sensopart.de FR-1

Producer

Being in market since 1989, Sensor to Image is one of the most established companies in the field of machine vision. Focused on OEM business, products like frame grabbers and image processing boards have been developed in the past. Now we are focused on FPGA based smart systems and technology for machine vision to realize powerful systems with small dimensions.

Sensor to Image GmbH · Lechtorstr. 20, 86956 Schongau, Germany,
Tel.: +49 8861 2369 0, Fax: +49 8861 2369 69, email@sensor-to-image.de, www.sensor-to-image.de A-3

Integrator

Die Seritec GmbH ist ein junges, dynamisches Unternehmen, dessen Schwerpunkt in der Entwicklung und Integration von Bildverarbeitungssystemen liegt.Wir bieten maßgeschneiderte Inspektionslösungen für Qualitätsmanagement und Ressourceneffizienz in der Produktion.Gemeinsam mit unserem Partnerunternehmen Preccon Robotics GmbH liefern wir auch individuelle und effiziente Gesamtlösungen im Bereich Robot Vision.Wir stehen Ihnen gerne mit unserem Know-how zur Seite.

Seritec GmbH · Gottlieb-Keim-Str. 60, 95448 Bayreuth, Germany,
Tel.: +49 921 990093 30, info@seritec.de, www.seritec.de N-4

Producer

Sharp is a worldwide developer of core digital technologies that are playing an integral role in shaping the next generation of electronic products for consumer and business needs. Sharp Microelectronics Europe offers groundbreaking solutions in the areas of LCD, Opto Components, CCD/CMOS camera solutions and components, RF/IR, IC and LSI components, along with packaging and integration skills that help design engineers throughout Europe to bring their ambitious ideas to market.

Sharp Microelectronics Europe · Sonninstr. 3, 20097 Hamburg, Germany,
Tel.: +49 40 2376 0, Fax: +49 40 2376 2510, info.sme@sharp.eu, www.sharpsme.com HH-8

Media

GIT SICHERHEIT + MANAGEMENT magazine reaches all decision makers involved in investment – in purchasing, specialist departments, management level, private as well as public sector. The sections: Management, Security and CCTV, Information Technology, Fire Protection and Safety. Decision makers and opinion leaders inform themselves with GIT SICHERHEIT + MANAGEMENT about market news, products, companies, applications and trends. Print run: 30,000. Verified circulation: 28,877 (IVW Q2 09)

GIT SECURITY
MAGAZINE FOR SAFETY AND SECURITY

GIT SICHERHEIT + MANAGEMENT
MAGAZIN FÜR SAFETY UND SECURITY

Sicherheit + Management
Roesslerstr. 90
64293 Darmstadt
Germany
Tel.: +49 6151 8090 130
steffen.ebert@wiley.com
www.gitsicherheit.de DA-5

Producer

Sick is one of the world leading suppliers of Industrial Sensors and Safety solutions. Sick provides industrial vision cameras for factory and logistics automation. The product line includes Vision Sensors, Smart Cameras, Code readers, Accessories and Cameras for high speed 3D Machine Vision. Target customers are Machine Builders, System Integrators and End Users.

Sick AG · Erwin-Sick-Str. 1, 79183 Waldkirch, Germany,
Tel.: +49 7681 202 0, Fax: +49 7681 202 3863, eva.persson@sickivp.se , www.sick.com FR-2

Producer

Distinct coding of products or parts of products is a key requirement of modern production processes. With our stationary and handheld code reading systems we offer just the right products for reading and verification of 1-D and 2-D codes, such as bar codes and data matrix codes. This allows tracking and tracing of production batches along the entire production process and beyond. Application-specific machine vision tasks – such as the automatic parts recognition by means of shapes, dimensions, samples, outlines, or colors – can be optimally solved with our vision sensors.

Siemens AG · Gleiwitzer Str. 555, 90475 Nürnberg, Germany,
Tel.: +49 911 895 0, Fax: +49 911 895 2132, info.simatic-sensors@siemens.com,
www.siemens.de/simatic-sensors/mv N-5

Solution Provider

Signum was established in 1982 and was from the beginning specialized in providing complete machine vision solutions for the industry. Our activities are mainly focused on imprint control, surface inspection, position tracking and control, process control and code reading. We provide systems for the automotive supplying, pharmaceutical and print industry as well as for semiconductor and plastic manufacturers.

Signum Computer GmbH · Rüdesheimer Str. 21, 80686 München, Germany,
Tel.: +49 89 5470550, Fax: +49 89 574583, sales@signum-vision.de, www.signum-vision.de M-24

About Silicon Software

Silicon Software is one of the international technology leaders with innovative product lines for a broad range of applications and service provider for customized adaptations.

The company produces off-the-shelf products as well as customized OEM solutions. Base products are the series of intelligent image acquisition and processing boards, supporting PCI, PCI Express with CameraLink as well as GigabitEthernet. Advantage of this technology is the programmability of the on-board vision processors allowing to realize a broad field of real-time applications. Silicon Software delivers acquisition applets with sophisticated pre-processing functionality as well as SmartApplets with partial application solutions with its products.

Further focus is the VisualApplets product line. The graphical software tool dramatically eases the programming of vision processor hardware. Even software programmers and application engineers will be able to implement demanded and time-critical applications on hardware in a few minutes.

Management
Dr. Ralf Lay, CEO
Dr. Klaus-Henning Noffz, CEO

Foundation
1997

Staff
11-50

Products
Frame Grabber, Software

Applications
Digitalization, High Speed Analysis, Inspection Piece Parts, Inspection Webbed Material, Material Testing, Metrology 2D, Metrology 3D, Part Identification, Particle Analysis, Others

Industries served
Automotive and Suppliers, Electronics/Semiconductors, Energy/Water/Solar Technology, Foodstuffs/Beverages, Glass/Ceramics, Mechanical Engineering/Line Building, Medical Technology, Metal, Packaging, Paper/Wood, Pharmaceuticals/Cosmetics/Chemicals, Plastics, Precision Engineering/Optics/Machine Vision, Traffic/Logistics, Other

Associations
AIA, EMVA, VDMA

Regions served
Asia, Europe, Latin America, North America, national

SILICONSOFTWARE

Silicon Software GmbH
Steubenstr. 46
68163 Mannheim
Germany
Tel.: +49 621 789507 0
Fax: +49 621 789507 10
info@silicon-software.de
www.silicon-software.com

MA-1

See our ad on page 29

About Stemmer Imaging

Stemmer Imaging is Europe's largest imaging technology and service provider with subsidiaries in Germany, United Kingdom, France and Switzerland. Our customers have access to a wide variety of imaging products from the world's leading manufacturers who provide cutting edge vision technology across all product segments. In addition, Stemmer Imaging are the developers of the world's leading independent, modular programming library for imaging applications, Common Vision Blox (see www.commonvisionblox.com), and also manufacture application-specific products to enable complex solutions to be realised easily.

This broad range of components and solutions, plus our experience of more than 30 years in imaging and our comprehensive support by a staff of more than 120 employees with a high percentage of engineers allows us to offer you everything you need to solve your imaging task.
Stemmer Imaging – Imaging is our passion!

Office(s)
Stemmer Imaging Ltd
United Kingdom
Tel.: +44 1252 780000
Fax: +44 1252 780001
info@stemmer-imaging.co.uk

Stemmer Imaging S.A.S.
France
Tel.: +33 1 45069560
Fax: +33 1 40991188
info@stemmer-imaging.fr

Stemmer Imaging AG
Switzerland
Tel.: +41 55 4159090
Fax: +41 55 4159091
info@stemmer-imaging.ch

Foundation
1987

Staff
101-250

Products
Cameras, Consulting, Frame Grabber, Interfaces/Cables/Peripherals, Lighting Equipment, Optics, Processors, R&D, Smart Cameras/Embedded Systems, Software, Vision Sensors

Applications
Character Recognition, Digitalization, High Speed Analysis, Inspection Piece Parts, Inspection Webbed Material, Material Testing, Metrology 2D, Metrology 3D, Part Identification, Particle Analysis, Robot Vision 2D, Robot Vision 3D, Symbol Recognition, Thermography, Others

Industries served
Automotive and Suppliers, Electronics/Semiconductors, Energy/Water/Solar Technology, Foodstuffs/Beverages, Glass/Ceramics, Mechanical Engineering/Line Building, Medical Technology, Metal, Packaging, Paper/Wood, Pharmaceuticals/Cosmetics/Chemicals, Plastics, Precision Engineering/Optics/Machine Vision, Traffic/Logistics, Other

Associations
AIA, EMVA, UKIVA, VDMA

Regions served
Asia, Europe, North America, national

STEMMER® IMAGING

Stemmer Imaging
Gutenbergstr. 9–13
82178 Puchheim
Germany
Tel.: +49 89 80902 0
Fax: +49 89 80902 116
info@stemmer-imaging.de
www.stemmer-imaging.com

M-23

See our ad on page 21

Producer

Sill Optics founded in 1894 is a private owned medium size company, specializing in the production of optical components. With an investment in latest equipment, we can comply with any modern demands on optical manufacturing in highest precision or high power laser quality for rapid prototyping or off the shelf components. The product range covers optical components and assemblies for OEM Equipments like scan lenses and beam expanders, Telecentric lenses, LED Condensors, light sources and Lenses for Shadow Projectors and Measurements.

Sill Optics GmbH & Co. KG · Johann-Höllfritsch-Str. 13, 90530 Wendelstein, Germany,
Tel.: +49 9129 9023 0, Fax: +49 9129 9023 23, info@silloptics.de, www.silloptics.de — N-6

Solution Provider

Als Systemintegrator hat sich Simon IBV auf Software für die Prüfung und Auswertung von Produktbilddaten spezialisiert. Ziel ist eine effiziente Analyse von Fehlproduktionen und eine Optimierung des Fertigungsprozesses. Dafür haben wir eine Reihe innovativer Lösungen entwickelt. Als zertifizierter System-Partner im Fachbereich Simatic Machine Vision lösen wir auch gemeinsam mit Siemens komplizierte Problemstellungen in der Mess- und Prüftechnik im Bereich der industriellen Bildverarbeitung.

Simon IBV GmbH · Bayreuther Str. 5b, 95494 Gesees, Germany,
Tel.: +49 9201 91742 0, Fax: +49 9201 91742 80, info@simon-ibv.de, www.simavis.de — N-7

Producer, Solution Provider

Highspeed cameras, machine vision, long time highspeed video recording, data acquisition for highspeed cameras, multi-head highspeed camera systems, custom solutions, rental, services.

slomotec, Dr. Frank Gabler · Grimmelshausenstr. 14, 63628 Bad Soden-Salmünster, Germany,
Tel.: +49 6056 9836 674, Fax: +49 6056 2097 529, info@slomotec.de, www.slomotec.de — F-7

Producer, Solution Provider

Manufacturer/Supplier of intelligent 3D-Cameras and 3D-Vision- Sensors for all areas of industrial image processing.

Smartray GmbH · BGM-Finsterwalder-Ring 12, 82515 Wolfratshausen, Germany,
Tel.: +49 8171 9683 400, Fax: +49 8171 9683 401, info@smartray.de, www.smartray.de — M-25

Integrator, Solution Provider

Survace for surface inspection (machine vision), survmotion for motion detection and tracking (surveillance).

SmartSurv Vision Systems GmbH · Malmsheimer Str. 7, 71063 Sindelfingen, Germany,
Tel.: +49 7031 3041800, Fax: +49 7031 3041800, info@smartsurv.de, www.smartsurv.de — S-16

Producer

Solving3D is manufacturer of metric solutions for machine vision based on photogrammetric measurement techniques with the core competency in development of camera based measurement systems for inline applications and inspection as well as for dynamic applications in vehicle safety. The systems have the distinction of precise stereo image measurement and laser triangulation. Solving3D develops and distributes measurement systems for inline applications as well as customer specific solutions.

Solving3D GmbH · Osteriede 5, 30827 Garbsen, Germany,
Tel.: +49 5131 907 97 20, Fax: +49 5131 907 97 29, info@solving3d.de, www.solving3d.de — H-1

Producer

Steinbichler Optotechnik is a worldwide leading supplier of optical measuring and sensor technology. Our systems are in operation at numerous well-known industrial companies and research institutes – to our customers, we offer innovative and efficient solutions for a wide variety of applications. Our product range includes: – 3D digitizing – surface inspection – shearography tire testing- shearography – non-destructive testing – vibration & deformation analysis.

Steinbichler Optotechnik GmbH · Georg-Wiesböck-Ring 12, 83115 Neubeuern, Germany,
Tel.: +49 8035 8704 0, Fax: +49 8035 1010, sales@steinbichler.de, www.steinbichler.de — M-26

Machine Builder/OEM

Hardness Testing Machines, Spring Testing Machines, 3D Coordinate Measuring Machines.

Stiefelmayer-Reicherter GmbH & Co. KG · Boschstr. 10, 73734 Esslingen, Germany,
Tel.: +49 711 490 4690 0, Fax: +49 711 490 4690 13, reicherter@stiefelmayer.de, www.stiefelmayer.de — GP-2

Integrator

Development of automated Inspection Systems with integrated Machine Vision, production of sophisticated control systems with intelligent camera units and special LED-lighting.

Stöhrmann Systemtechnik · Im Erlenwäldele 21, 77955 Ettenheim, Germany,
Tel.: +49 7822 895203, Fax: +49 7822 895205, info@stoehrmann.de, www.stoehrmann.de — OG-2

Producer

Process automation for the beverage-, packing-, food-, glass- and new glass industry. control, inspection, detection, sorting, distribution, rejection.(x-ray, gamma, hf, ultrasonic, image processing, light sensor)

Stratec Control Systems · Ankerstr. 73, 75203 Königsbach-Stein, Germany,
Tel.: +49 7232 4006 0, Fax: +49 7232 4006 25, info@bbull.com, www.bbull.com — PF-1

Producer

Industrial image processing, software products and hardware (unique solutions and small series); applied research and development; statistical techniques of quality assurance and CAQ; consulting and further education; workshops and employee training for quality assurance, image processing and production measurement technology; preparation of companies for certification according to ISO 9001:2000; consulting of companies regarding raising funds for research and development projects

STZ Qualitaetssicherung & Bildverarbeitung · Werner-von-Siemens-Str. 12, 98693 Ilmenau, Germany,
Tel.: +49 3677 208066, Fax: +49 3677 208067, stz@stz-ilmenau.de, www.stz-ilmenau.de — EF-3

Producer

Tamron is a 58 years old lens manufacturer providing high quality/performance machine vision lenses. We have 2/3, 1/1.8 Mega Pixel lenses, which can maximize performance of the mega pixel cameras. The MOD of the lenses are 10 cm, and the distortion is designed to be nearly 0 %.

Tamron Europe GmbH · Robert Bosch Str. 9, 50769 Köln, Germany,
Tel.: +49 221 970 32 50, Fax: +49 221 970 32 54, cctv@tamron.de, www.tamron.de — K-5

About SVS-Vistek

SVS-Vistek is one of Germany's leading manufacturers of industrial cameras, a reliable supplier of components for machine vision purposes, and a specialist for highly integrated imaging systems and solutions. Founded in 1987 SVS-Vistek has more than 20 years of comprehensive experience in the machine vision market. Since 1999 the company has been developing and manufacturing its own cameras in Seefeld, Germany.

SVS-Vistek's three core competences:

1. Camera development and production,
2. Distribution and integration of imaging components and
3. Imaging system solutions development

in combination with the experience of SVS-Vistek provides unique and valuable benefits to customers.

Our detailed knowledge and understanding of diverse vision application areas forms the basis for the development of our cameras and our highly responsive and customer-oriented organization. SVS-Vistek offers global sales and support through a world-wide network of highly skilled partners.

Management
Ulf Weißer, President
Walter Denk, President

Foundation
1987

Staff
11-50

Products
Cameras, Consulting, Frame Grabber, Integration Services, Interfaces/Cables/Peripherals, Lighting Equipment, Optics, Software, Turn-key Systems, Vision Sensors

Applications
Character Recognition, High Speed Analysis, Inspection Piece Parts, Metrology 2D, Part Identification, Robot Vision 2D, Symbol Recognition, Others

Industries served
Automotive and Suppliers, Electronics/Semiconductors, Energy/Water/Solar Technology, Foodstuffs/Beverages, Glass/Ceramics, Mechanical Engineering/Line Building, Medical Technology, Metal, Packaging, Paper/Wood, Pharmaceuticals/Cosmetics/Chemicals, Plastics, Precision Engineering/Optics/Machine Vision, Traffic/Logistics

Associations
AIA, EMVA, VDMA

Regions served
Asia, Central Europe, China, EMEA, Europe, Japan, Latin America, North America, national

Companies represented
Euresys S.A., Microscan

SVS-VISTEK

SVS-Vistek GmbH
Mühlbachstr. 20
82229 Seefeld
Germany
Tel.: +49 8152 9985 0
Fax: +49 8152 9985 79
info@svs-vistek.com
www.svs.vistek.com

M-27

Solution Provider

Tema, affiliated with the Mühlbauer Group, is an international provider of one-stop turnkey machine vision solutions mainly for the packaging, security printing, and minting sector but also for other industries. Though focusing on surface and print inspection, a variety of methods are used to guarantee 100 % fully automatic inspection, protocols, and statistics. Company developed software and lighting solutions enable customized vision systems – either as inline solutions or stand-alone units.

Tema · Wilhelmstr. 41-43, 58332 Schwelm, Germany,
Tel.: +49 2336 9298 50, Fax: +49 2336 9298 82, info@temavisio.com, www.temavisio.com

D-6

Producer, Solution Provider

Thermosensorik GmbH was founded 1998 as a pioneer in infrared technology for civil applications in research and industry. Thermosensorik offers infrared cameras and infrared optics, thermal excitation sources for heat flux thermography, various software solutions, turnkey solutions for non-destructive testing as well as services like feasibility studies and commissioned tests. Thermosensorik's products satisfy the highest demands – be it in active and passive IR imaging, lock-in or pulse…

THERMO SENSORIK GmbH

Thermosensorik GmbH
Am Weichselgarten 7
91058 Erlangen
Germany
Tel.: +49 9131 691 400
Fax: +49 9131 691 419
info@thermosensorik.de
www.thermosensorik.de

N-8

Producer

Established in 1990, The Imaging Source has become a leading manufacturer of industrial machine vision cameras, frame grabbers and video converters, serving the following sectors: Factory automation, Quality inspection, Medical systems, Microscopy systems, Life science projects and Astronomy. All imaging components manufactured by The Imaging Source ship with the SDK IC Imaging Control.

The Imaging Source Europe GmbH · Sommerstr. 36, 28215 Bremen, Germany,
Tel.: +49 421 335 91 0, Fax: +49 421 335 91 80, info@theimagingsource.com,
www.theimagingnsource.com

HB-1

Producer

The first camera products were line scan cameras developed for spectroscopy analysis and online measuring. With these cameras we started to develop a wide range of industrial cameras. Our competence includes Contact Image Sensors, cameras and interfaces.

Tichawa Vision GmbH · Burgwallstr. 14, 86316 Friedberg, Germany,
Tel.: +49 821 6080 660, Fax: +49 821 6080 661, sales@tichawa.de, www.tichawa.de

A-4

Producer

VDS Vosskuehler develops and produces high performance digital cameras for industrial and medical application. Digital Cameras: CCD, CMOS, NIR, LWIR, UV, XRAY.

VDS Vosskühler GmbH · Weiße Breite 7, 49084 Osnabrück, Germany,
Tel.: +49 541 800 84 0, Fax: +49 541 800 84 10, vds@vdsvossk.de, www.vdsvossk.de
OS-1

Producer

Vialux was founded in 2000 based upon the owners' 20 years background in optical metrology. Combining advanced opto-electronics with mature software algorithms forms the strength of the company in this field. Vialux addresses with its products customer needs in different industrial branches. The hand-held z-Snapper camera represents a new generation of 3D scanner that is powered by DLP technology. Vialux is a Value Added Reseller for DLP Discovery components and provides world-wide support.

Vialux GmbH · Am Erlenwald 10, 09128 Chemnitz, Germany,
Tel.: +49 371 33 42 47 0, Fax: +49 371 33 42 47 10, info@vialux.de, www.vialux.de
C-2

Distributor

Videor is one of the major distributors of professional video technology. The product range of the company based near Frankfurt/Germany based upon the strict quality standards applied by the supplier in compliance with its ISO 9001:2008 certification, its strong purchasing position on international hi-tech markets as well as over 30 years knowledge of the market.

Videor E. Hartig GmbH · Carl-Zeiss-Str. 37, 63322 Rödermark, Germany,
Tel.: +49 06074 888 0, Fax: +49 06074 888 100, info@videor.com, www.videor.com
F-8

Solution Provider

visicontrol is developing, producing, and selling machine vision systems for automation and quality control. Our systems are based on our own machine vision software and hardware.

visicontrol GmbH · Ettishofer Str. 8, 88520 Weingarten, Germany,
Tel.: +49 751 560 13 0, Fax: +49 751 560 13 49, info@visicontrol.com, www.visicontrol.com
RV-5

Machine Builder/OEM, Solution Provider

Visimation supplies high value vision systems for automation. As a young and growing company we support high demanding globally operating customers from the automotive supplier industry. Our range of products and services expands from the integration of machine vision systems via the design and production of complex customized plants to the inspection of parts in commission orders.

Visimation GmbH · Arbuchtalstr. 20, 72800 Eningen, Germany,
Tel.: +49 7121 3040800, Fax: +49 7121 890705, post@visimation.de, www.visimation.de
S-17

Producer

As a technology leader, our company develops, produces and sells an optimally attuned modular system worldwide. It ranges from complex image processing systems to individual high performance LED lighting and precision optics. To master challenging image processing tasks that would overtax standard components, we offer our customers tailor-made image capturing and processing solutions. Leading OEMs and system integrators have banked on state-of-the-art design by Vision & Control for almost 20 years.

Vision & Control GmbH · Mittelbergstr. 16, 98527 Suhl, Germany,
Tel.: +49 3681 79 74 0, Fax: +49 3681 79 74 22, www.vision-control.com
SHL-2

Consultant, Other

Certified institution for practical education and further training of Machine Vision expertise. Covering all fields of Machine Vision.Courses in different levels of demand. Languages: German, English

Vision Academy · Konrad-Zuse-Str. 15, D-99099 Erfurt, Germany,
Tel.: +49 361 4262 188, Fax: +49 361 4262 189, www.vision-academy.org
EF-4

Producer

Vision Components is a leading developer of machine vision technology, focusing on the manufacture and distribution of intelligent cameras for industrial use. With strategic partnerships with many key integrators and software providers, Vision Components offers a complete line of advanced industrial smart cameras for an array of applications. Product line includes single board OEM, miniature and standard Smart Cameras.

Vision Components GmbH · Ottostr. 2, 76275 Ettlingen, Germany,
Tel.: +49 7243 2167 0, Fax: +49 7243 2167 11, sales@vision-components.com,
#www.vision-components.com
KA-10

Producer

Vision Engineering designs and manufactures eyepieceless optical stereo microscopes, inspection systems and non-contact measurement systems for a wide range of laboratory and industrial applications.

Vision Engineering Ltd. · Anton-Pendele-Str. 3, 82275 Emmering, Germany,
Tel.: +49 8141 401670, Fax: +49 8141 4016755, info@visioneng.de, www.visioneng.de
M-28

Producer

Vision Research designs and manufactures high-speed digital imaging systems used in applications including defense, automotive, engineering, science, medical research, industrial manufacturing and packaging, sports and entertainment, and digital cinematography for television and movie production. Vision Research digital highspeed cameras add a new dimension to the sense of sight, allowing the user to see details of an event when it's too fast to see, and too important not to.

VISION RESEARCH
An AMETEK® Company

Vision Research Europe
Baldreitstr. 5
76530 Baden-Baden
Germany
Tel.: +49 7221 97064 65
Fax: +49 7221 97064 66
heiner.ramsbott@visionresearch.com
www.visionresearch.com
KA-11

Solution Provider

Vision Tools is one of the leading suppliers of Industrial Image Analysis Systems (Quality control, Character recognition, Robotics) for car manufacturers and their suppliers as well as the electrical industry. Further application fields are: plastic industry and pharmacy.

Vision Tools Bildanalyse Systeme GmbH · Goethestr. 63-65, 68753 Waghäusel, Germany,
Tel.: +49 7254 9351 0, Fax: +49 7254 9351 20, info@vision-tools.com, www.vision-tools.com
KA-12

Integrator, Solution Provider

Visotect ist Systemintegrator für industrielle Bildverarbeitung mit Schwerpunkt Qualitätskontrolle.Wir liefern komplette Anwendungen, von den Vorversuchen im Labor oder vor Ort beim Kunden, über die ausgeführte Bildverarbeitungs-Hard- und Software, bis hin zur Montage und Mitarbeiterschulung. Visotect arbeit mit mehreren Bildverarbeitungs-Systemen. Damit kann eine große Palette möglicher Aufgabenstellungen mit maximaler Zuverlässigkeit und dennoch kosteneffizient gelöst werden.

Visotect GmbH · Heubergstr. 19, 70806 Kornwestheim, Germany,
Tel.: +49 7154 800 88 61, info@visotect.de, www.visotect.de

S-18

Distributor

CCD/CMOS Sensors, CCD Cameras, EMCC Cameras, CMOS/CCD Line Scan Cameras, Firewire 1394B to PCIe Interface Boards, Illumination Devices, DC/DC Converters, Fingerprint Security Products.

Vistas GmbH · Freisinger Str. 13, 85737 Ismaning, Germany,
Tel.: +49 89 929 280 90, Fax: +49 89 929 280 99, info@vistas-gmbh.de, www.vistas-gmbh.de

M-29

Producer, Solution Provider

Vitronic has been marketing since 1984 standard products with client- specific extendable modules up to individual specific solutions. They are developed, manufactured and marketed by Vitronic. In this way, the clients receive turnkey ready systems from one source – from the hardware to the software. Thanks to its pioneering achievements and its persistent investment in research and development, Vitronic is today one of the leading companies in the field of image processing. In the year 2008 Vitronic had more than 300 employees.

Vitronic Dr.-Ing. Stein Bildverarbeitungssysteme GmbH · Hasengartenstr. 14, 65189 Wiesbaden, Germany, Tel.: +49 611 7152 0, Fax: +49 611 7152 133,
sales@vitronic.com, www.vitronic.com

WI-3

Distributor, Integrator, Producer, Solution Provider

viZaar develops and manufactures remote visual inspection equipment, special OEM cameras and industrial endoscope systems. Our inspection and service department offers in field inspection services, rentals and camera repair. We are certified and have a hot shop for the nuclear industry. The service and product bandwidth reaches from Ultra Violet to Infrared imaging and high speed cameras.

viZaar AG · Hechinger Str. 152, 72461 Albstadt, Germany,
Tel.: +49 7432 98375 0, Fax: +49 7432 98375 50, info@vizaar.de, www.vizaar.de

MZ-5

Solution Provider

VMT supplies customized turnkey image processing and laser sensor systems for all industrial sectors. VMT solutions are based on self-developed product lines, which cover the entire application spectrum. As competence center for vision solutions in the Pepperl+Fuchs group, VMT offers absolute high-level technology combined with highest investment security. VMT is consultant to its customers and provides them with a solid basis for decision- making for their investments.

VMT Vision Machine Technic Bildverarbeitungssysteme GmbH · Mallaustr. 50-56, 68219 Mannheim, Germany, Tel.: +49 621 84250 0, Fax: +49 621 84250 290,
info@vmt-gmbh.com, www.vmt-gmbh.com

MA-2

Producer

Volpi is a provider of fiber optic and LED illumination components for use in machine vision, microscopy, and medical diagnostics. Another main area of activity is the development of fiber optic sensors for customized applications.

Volpi AG · Wiesenstr. 33, 08952 Schlieren, Switzerland,
Tel.: +41 4473 243 43, Fax: +41 4473 243 44, mail@volpi.ch, www.volpi.ch

ZH-4

Producer

The German camera manufacturer VRmagic offers a wide range of components for industrial image processing – from external analog-to-digital converters through to FPGA components with integrated image preprocessing and fully autonomously working intelligent cameras. The product range includes cameras in housing and OEM variants – from sensor boards through to special designs such as multisensor cameras. The modules can be individually configured as required.

VRmagic

VRmagic GmbH
Augustaanlage 32
68165 Mannheim
Germany
Tel.: +49 621 4004 16 20
Fax: +49 621 4004 16 99
info.imaging@vrmagic.com
www.vrmagic-imaging.com

MA-3

Producer

For 25 years the name of wenglor has stood for innovative products for contact free object recognition. Founded in 1983 wenglor today employs more than 500 people worldwide and continues to develop on an international basis. Over 50,000 leading customers throughout the world trust wenglor to master their industrial automation challenges. wenglor offers a broad range of Image Processing, Vision Sensors, OCR Readers, Scanners, Illumination and of course service and trainings for all these products. wenglor looks forward to finding the solution to your vision application.

wenglor sensoric gmbh · Wenglor Str. 3, 88069 Tettnang, Germany,
Tel.: +49 7542 5399 0, Fax: +49 7542 5399 988, info@wenglor.com, www.wenglor.com

RV-6

Machine Builder/OEM, Solution Provider

The optical measuring system from Wenzel verifies components directly in the production process. Through the combination with the reliable measuring software Metrosoft CM it is possible to control parts directly in the production line without delays. Due to the use of an intelligent camera system work pieces are checked within the cycle time of the production line. The measuring data can then be given immediately to the process controller.

Wenzel Group GmbH & Co. KG · Werner-Wenzel-Str., 97859 Wiesthal, Germany,
Tel.: +49 6020 201 0, Fax: +49 6020 201 1999, info@wenzel-cmm.com, www.wenzel-cmm.com

F-9

Producer

Werth Messtechnik GmbH is the leading international manufacturer of multisensor coordinate measuring machines.Product range: optical and tactile multisensor coordinate measuring machines – including x-ray computer tomography, measuring and profile projectors.

Werth Messtechnik GmbH · Siemensstr. 19, 35394 Gießen, Germany,
Tel.: +49 641 7938 0, Fax: +49 641 7938 719, marketing@werthmesstechnik.de,
www.werthmesstechnik.de

GI-2

Producer

X-Rite is the global leader in color science and technology. The company, which now includes design industry color leader Pantone, Inc., develops, manufactures, markets and supports innovative color solutions through measurement systems, software, color standards and services. X-Rite's expertise in inspiring, selecting, measuring, formulating, communicating and matching color helps users get color right the first time and every time, which translates to better quality and reduced costs.

X-Rite Europe GmbH · Althardstr. 70, 08105 Regensdorf, Switzerland,
Tel.: +41 44 842 24 00, Fax: +41 44 842 22 22, info-germany@xrite.com, www.xrite.com

ZH-5

Machine Builder/OEM

Yxlon International is the leading supplier of Industrial X-ray inspection systems and industrial Computed Tomography (CT) solutions for the non-destructive testing of materials (NDT).

Yxlon International GmbH · Im Bahlbrink 11-13, 30827 Garbsen, Germany,
Tel.: +49 5131 7098 0, Fax: +49 5131 7098 80, yxlon@han.yxlon.com, www.yxlon.com
H-2

Integrator, Solution Provider

Zertrox is your local vision specialist in Aachen-Germany with European experience. We develop the fitting solution for your task and deliver a vision system that satisfies you. Within over five years of experience our customers come from the automotive, metal, paper, plastic and glass industry. We will find the right vision system for your task – just give us the chance to prove this.

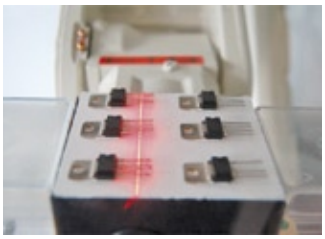
Zertrox GmbH & Co. KG · Bachstr. 62-64, 52066 Aachen, Germany,
Tel.: +49 241 9977 164, Fax: +49 241 9977 165, info@zertrox.de, www.zertrox.de
K-6

Producer

We are the laser provider for innovative customer applications in the following sectors:

- Vision/3D-Measurement/Surface Inspection
- Biophotonics/Medical
- Laser projection for positioning applications

Our vast number of laser projections is used as structured light in combination with various camera systems in image processing for triangulation measurement.The intelligent mechanics, electronics and optics of our products allow us to be very flexible with all requirements.



Z-LASER

Z-LASER Optoelektronik GmbH
Merzhauser Str. 134
79100 Freiburg
Germany
Tel.: +49 761 2964444
info@z-laser.de
www.z-laser.com
FR-3

Producer

ZygoLOT was founded in 1999 as a joint venture between LOT-Oriel GmbH and Zygo Corporation, supplier of optical metrology instruments, precision optics, and electro-optical design/manufacturing services. LOT-Oriel, the exclusive European distributor of Zygo's metrology products for more than 30 years, formed ZygoLOT with a group of highly-skilled people having a long history and high level of competence with optical metrology, and understands how to apply Zygo technologies to best serve our customers.

ZygoLOT GmbH · Im Tiefen See 58, 64293 Darmstadt, Germany,
Tel.: +49 6151 8806 27, Fax: +49 6151 8806 27, info@zygolot.de, www.zygolot.de
DA-6

GUIDE

ENT, INSPECTION, IDENTIFICATION, GUIDANCE

GENERATION

NETWORKING

ONLINE-ARCHIVE

TREND TOPICS

WEBINARS

ONLINE.COM

AND TECHNOLOGIES JOBS

ND MEASURING INSTRUMENTS

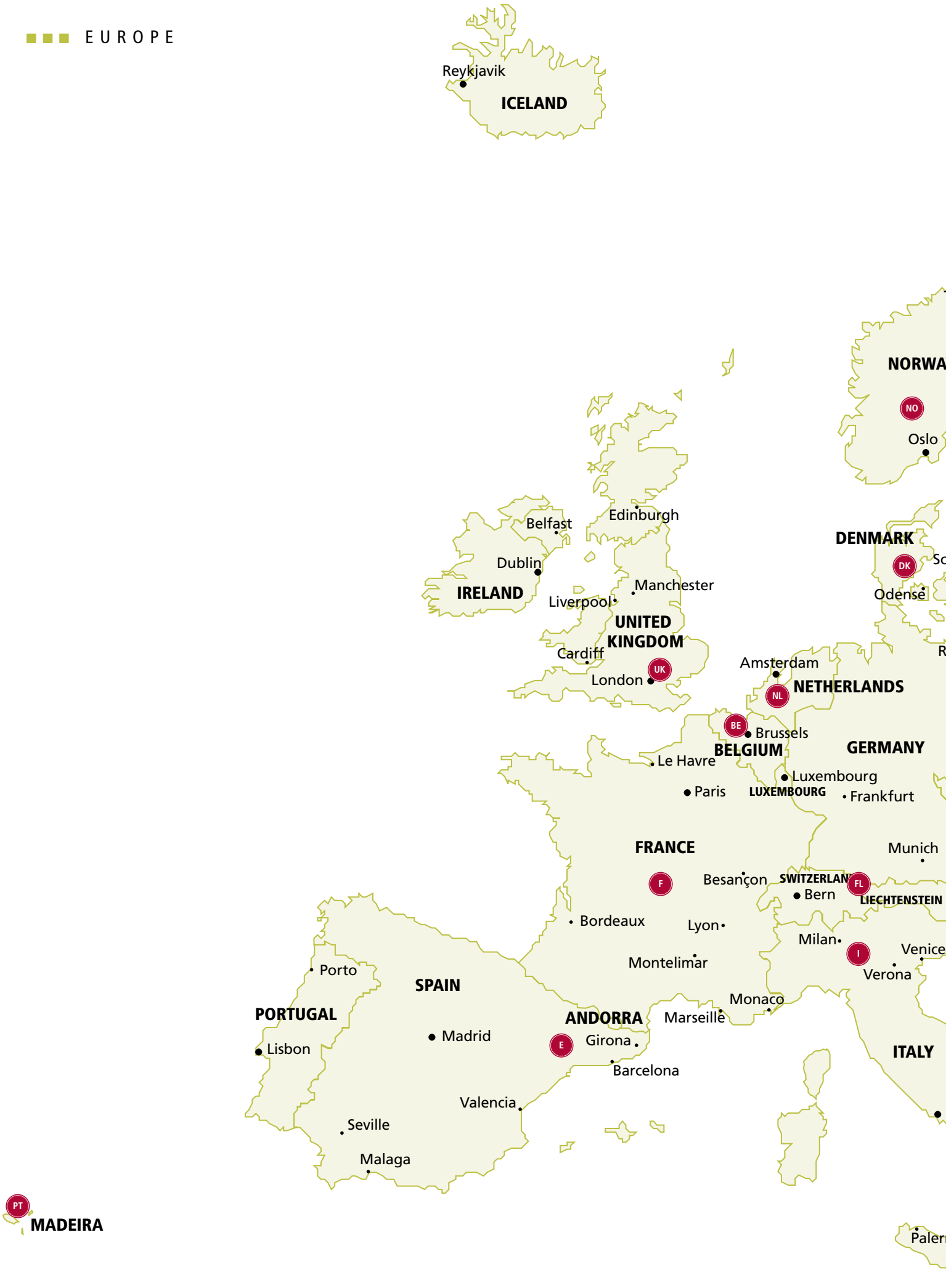
RSS FEED WEBCASTS

PRODUCT INFORMATION

- **INSPECT, the leading European cross-media information source for decision makers**
- **Make use of our online search engines for products, suppliers, technologies, applications, industry solutions, people, and much more**
- **Find feature articles, machine vision basics, interviews, reports and other data in our online archive of recent INSPECT issues**
- **Get in contact with your business partners directly by using the E-Mail request function**

INSPECT

VISION · AUTOMATION · CONTROL


Reykjavik
ICELAND
NORWA
NO
Oslo
Edinburgh
Belfast
DENMARK
DK
Dublin
IRELAND
Manchester
Liverpool
Odense
UNITED
KINGDOM
Cardiff
UK
London
Amsterdam
NL
NETHERLANDS
BE
Brussels
BELGIUM
GERMANY
Le Havre
Luxembourg
LUXEMBOURG
Paris
Frankfurt
FRANCE
Munich
F
Besançon
SWITZERLAN
FL
Bern
LIECHTENSTEIN
Bordeaux
Lyon
Milan
I
Venice
Montelimar
Verona
Porto
SPAIN
Monaco
PORTUGAL
ANDORRA
Marseille
Madrid
E
Girona
ITALY
Lisbon
Barcelona
Valencia
Seville
Malaga
PT
MADEIRA
Paler


Oulu
Trondheim
FINLAND
FI
Gävle
Helsinki
SWEDEN
Tallinn
Stockholm
ESTONIA
SE
Göteborg
Riga
LATVIA
Soeborg
Copenhagen
LITHUANIA
Vilnius
Minsk
Rostock
Gdynia
BELARUS
Warsaw
Berlin
Poznan
POLAND
Kiev
Katowice
Prague
Krakow
UKRAINE
Luhansk
CZECH REPUBLIC
SLOVAKIA
Vienna
Bratislava
MOLDOVA
AUSTRIA
Budapest
Chisinau
Cluj-Napoca
Graz
HUNGARY
SI
Ljubljana
ROMANIA
SLOVENIA
Zagreb
Bucharest
CROATIA
BOSNIA AND HERZEGOVINA
Zagreb
SERBIA
Sarajevo
BG
BULGARIA
Podgorica
Sofia
MONTENEGRO
Skopje
Rome
MACEDONIA
Tirana
Istanbul
Thessaloniki
ALBANIA
GREECE
TURKEY
TR
Athens

Other

Active Silicon specialises in the design, manufacture and supply of digital imaging products and custom vision systems. Frame grabbers include the Phoenix, LFG and Snapper boards in PCI Express, COM Express, PCI, PMC, cPCI and PCI/104-Express form factors with support for Windows, DOS, Mac, OS X, Linux, QNX and VxWorks platforms. These provide acquisition solutions for a wide range of applications supporting analogue, CoaXPress, LVDS, HD-SDI and Camera Link (including PoCL) cameras.

Active Silicon Ltd · Pinewood Mews, Bond Close, SL0 0NA Iver, United Kingdom,
Tel.: +44 1753 650600, Fax: +44 1753 651661, info@activesilicon.com, www.activesilicon.com UK-1

Solution Provider

Alliance Vision is one of the leading companies in France, who provides innovative engineering, software solutions and imaging products in the field of machine vision and image analysis. Our team of highly qualified professional engineers operates in France to provide on-site evaluation and installation of vision and imaging systems.

Alliance Vision · 7 avenue du Meyrol , 26270 Montelimar, France,
Tel.: +33 4 75 53 14 00 , Fax: +33 4 75 53 14 04 , infos@alliancevision.com, www.alliancevision.com F-1

Distributor, Solution Provider

Applied Scintillation Technologies is a leading provider of advanced imaging and detection solutions. Our extensive knowledge and expertise enables us to supply a diverse range of application-focused products for both standard and customized solutions.

Applied Scintillation Technologies · 8 Roydonbury Industrial Estate, CM19 5BZ Harlow, United Kingdom,
Tel.: +44 1279 641234, Fax: +44 1279 413, sales@appscintech.com, www.appscintech.com UK-2

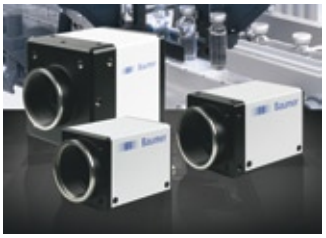
Producer, Solution Provider

Aqsense develops and commercializes 3D software libraries and FPGA IP blocks for 3D cameras. Emphasizing in laser triangulation Aqsense's customized applications and engineering solutions are supported with training and seminars. Feasibility studies for 3D integration include the evaluation of cameras, lasers and hardware configuration.

Aqsense S.L. · C/ Pic de Peguera, 17003 Girona, Spain,
Tel.: +34 972 183 215, Fax: +34 972 487 487, info@aqsense.com, www.aqsense.com E-1

Distributor

Baumer has established itself as the leading company for vision technologies. Its wide range of digital cameras, vision sensors and further image processing products with cutting-edge technologies provides high quality for industrial, scientific and medical applications. Next to vision products Baumer is known as the premier innovator for precision sensors, motion control, identification solutions, gluing systems and process instrumentation for the automation market.



Baumer

Baumer Italia S.r.l.
Via Resistenza 1
20090 Assago, MI
Italy
Tel.: +39 0 245706065
Fax: +39 0 245706211
sales.it@baumer.com
www.baumer.com I-1

Solution Provider

Awaiba LDA is a design house of CMOS image sensors for specific applications. Awaiba, develops image sensors for industrial inspection, medical endoscopes, high speed video systems and automotive on board cameras. Furthermore Awaiba offers consulting and development services for optics and packaging.

Awaiba · Madeira Tecnopolo, 9020-105 Funchal, Madeira, Portugal,
Tel.: +35 129 172 312 4, Fax: +35 129 172 317 4, info@awaiba.com, www.awaiba.com PT-1

Producer

Bentham manufactures spectroradiometer and spectrophotometer systems for the characterisation of light sources and optical properties of materials (UV, visible and infrared). Accessories include monochromators, light sources, integrating spheres, detectors, positioning devices and calibration standards.

Bentham Instruments Ltd · 2 Boulton Road, RG2 0NH Reading, United Kingdom,
Tel.: +44 118 975 1355, Fax: +44 118 931 2971, sales@bentham.co.uk, www.bentham.co.uk UK-3

Producer

CCS Lighting Solution – The world's highest standard of LED Lighting TechnologyLet our expertise work for you!
CCS provides high-added-value LED lighting that makes optimum use of our unique control, focus, and heat dissipation technology. Lighting from CCS is widely used in machine vision, microscopy and bio-medical. The key to success in these markets lies in the lighting technology. CCS proposes the most suitable solutions from a rich standard and a vast custom product lineup.

CCS
CREATIVE CUSTOMER SATISFACTION

CCS Europe
Bergensesteenweg 423 B13
01600 Sint-Pieters-Leeuw
Belgium
Tel.: +32 2 333 00 80
Fax: +32 2 333 00 81
info@ccseu.com
www.ccs-grp.com BE-1

Producer

Image sensor design and production.

CMOSIS nv · Amerikalei 163, 02000 Antwerpen, Belgium,
Tel.: +32 32 168610, Fax: +32 32 572129, info@cmosis.com, www.cmosis.com BE-2

Distributor

Sales/Service of Micron-Resolution filmscanners e.g PerkinElmer MicroDensitometers

CSI · 7 Meadowfield Park South, NE43 7QA Stocksfield, United Kingdom,
Tel.: +44 1661 842 741, Fax: +44 1661 842 741, GilScott@csi1.co.uk UK-4

Distributor, Producer, Solution Provider

Deben represent Advanced Microscopy Techniques (AMT) throughout Europe. Deben and AMT provide digital imaging solutions for Transmission Electron Microscopy (TEM). Our high resolution camera systems are reliable and easy to use and utilise cuttiing edge detector and camera technologies. Deben also supply an extended range of accessories for SEM and TEM applications including tensile stages, cooling stages and stage automation.

Deben UK Limited · Brickfields Business Park, IP30 9QS Woolpit, Bury St. Edmunds, Suffolk, United Kingdom,
Tel.: +44 1359 244870, info@deben.co.uk, www.deben.co.uk UK-5

Solution Provider

Digital Surf, founded in 1989, is a leading provider of solutions for surface metrology to metrology instrument manufacturers, research laboratories and industry worldwide. The company provides 2D/3D/4D imaging and analysis software based on its Mountains technology. It provides scanning solutions including modular, expandable control systems for driving multi-gauge, multi-axis profilometers and high precision confocal chromatic optical distance gauges based on its Volcanyon technology.

Digital Surf · 6 rue Lavoisier , 05000 Besançon, France,
Tel.: +33 3 81 50 48 00, Fax: +33 3 81 50 92 24, contact@digitalsurf.fr, www.digitalsurf.com F-2

Producer

e2v is designer and manufacturer of high tech electronic components and subsystems including semiconductors, sensors and electronic tubes.e2v supplies high performance CCD and CMOS imaging sensors and cameras for a broad range of demanding applications, operating across the electro-magnetic spectrum from X-rays, through ultraviolet and visible light to infrared.Delivered to standard or highly customized designs, our sensors serve space, astronomy, dental, scientific, medical and industrial markets.

e2v · Avenue de Rochepleine, BP123 3852 Saint Egreve Cedex, France,
Tel.: +33 47658 3000, Fax: +33 47658 3480, enquiries@e2v.com, www.e2v.com F-3

Integrator

We are the well known company around in Turkey as a Hi-Tech vision system designer with robot integration.

e3tam · B.Bulv 177d2, 34394 Istanbul, Turkey,
Tel.: +90 212 2752280, Fax: +90 212 2732319, inform@e3tam.com, www.e3tam.com TR-1

Producer

Euresys is a major player in the field of machine vision, developing and marketing high-performance products and services for imaging acquisition and vision-oriented analysis. Euresys offers a complete range of robust and powerful image analysis software tools for industrial machine vision; as well as innovative and high-performance image acquisition subsystems for high-end video surveillance and industrial machine vision applications.

Euresys · Avenue du Pré Aily , 14 4031 Angleur, Belgium,
Tel.: +32 43 677288, Fax: +32 43 677466, info@euresys.com, www.euresys.com BE-3

Solution Provider

FDS Research develops real-time machine vision systems, proprietary software solutions and design and build turn-key vision system. These systems are in majority applied to car and automotive industry. Our solutions are applied worldwide and control several million pieces of different products daily. FDS applications are based on common FDS Imaging Software platform. These kinds of solutions offer customers easier support, quick adjustment, improvement, and application optimization.

FDS Research, d.o.o. · Suhadolcânova 28, 01231 Ljubljana-Črnuče, Slovenia,
Tel.: +386 1 589 75 81, Fax: +386 1 589 75 87, info@fdsresearch.si, www.fdsresearch.si SI-1

Producer

Designer and manufacturer of semi-conducter laser diode modules and laser systems. Global Laser specialise in a wide range of OEM, high performance, high reliability laser diode module products for use within many niche applications including machine vision, alignment, medical, measurement, scientific and military.

Global Laser Ltd · Cwmtillery Industrial Estate, NP131LZ Abertillery, Gwent, United Kingdom,
Tel.: +44 1495 212213, Fax: +44 1495 214004, sales@globallasertech.com, www.globallasertech.com UK-6

Solution Provider

Inspection systems for quality control of semiconductor cells and wafers and solar cells.

Icos Vision Systems · Industriepark Haasrode zone 1 Esperantolaan 8, 03001 Heverlee, Belgium,
Tel.: +32 16 398 220, Fax: +32 16 400.067, info@icos.be, www.icos.be BE-4

Distributor

Infaimon is a company centered in machine vision, image analysis business and surveillance market and leader in the Spanish, Portuguese, Mexican and Latin America markets. We have a complete range of vision products.

Infaimon, S.L. · Vergós, 55 , 08017 Barcelona, Spain,
Tel.: +34 93 252 5757, Fax: +34 93 252 5758, infaimon@infaimon.com, www.infaimon.com E-2

Producer, Solution Provider

InRay Solutions is a company specialized in custom software and hardware development and consulting services. We are a reliable and innovative modern company, offering not only products, but also successful solutions. One of our main activities is development of high resolution digital camera for industrial and scientific applications together with real-time image processing systems. We have developed and successfully implemented integral systems for control and monitoring. Our team of highly skilled IT professionals has the knowledge and experience to help you achieve your business targets.

InRay Solutions Ltd. · 125 Tzarigradsko shosse blvd., block 2, room 510, 01113 Sofia, Bulgaria,
Tel.: +359 2 971 5751, Fax: +359 2 971 4796, inrays@inrays.com, www.inrays.com BG-1

Producer

JAI is a manufacturer of high quality, industrial-grade cameras for the machine vision, transportation, military, aerospace, homeland security, medical and scientific markets.JAI provides the broadest camera offering of any industrial matrix camera manufacturer in the world. JAI's product line features both CCD and CMOS technologies, spatial resolutions from VGA to multi-mega pixel, progressive scan and interlaced format, and sensitivity to light levels as low as .00001 lux.

JAI A/S · Valby Torvegade 17, 1st floor, 02500 Valby, Denmark,
Tel.: +45 4457 8888, Fax: +45 4491 3252, camerasales.emea@jai.com, www.jai.com DK-1

Solution Provider

Customer specified and turnkey vision systems for the industry: pharmaceutical, glass, plastic, steel, food, packaging etc. Customer specified systems at a fixed price and time – with a functional guarantee. Guidance for specification, design, test and validation of vision systems. JLI vision systems can be integrated with existing production equipment.

JLI vision a/s · Poppelgaardvej 7–9 , 02860 Soeborg, Denmark,
Tel.: +45 39 66 08 09, Fax: +45 39 56 08 12, info@jli.dk, www.jli.dk DK-2

Distributor

Lambda is a Distributor in the UK for a wide range of Vision Products from key suppliers in Europe, the USA and Far East.

Lambda Photometrics Ltd. · Lambda House, Batford Mill , AL5 5BZ Harpenden, United Kingdom,
Tel.: +44 1582 764334, Fax: +44 1582 712084, adrian@lambdaphoto.co.uk, www.lambdaphoto.co.uk UK-7

Producer

Laser Quantum is a world-class manufacturer of high quality solid-state laser sources specializing in CW visible and IR. Our products are known throughout the world for reliability, compactness, performance-excellence and long operational lifetime. You'll find our products in scientific laboratories and integrated in systems and machines world-wide.

Laser Quantum Ltd · Emery Court, SK4 3GL Stockport, United Kingdom,
Tel.: +44 161 975 5300, Fax: +44 161 975 5309, info@laserquantum.com, www.laserquantum.com
UK-8

Distributor

Exclusive agent for S-T Industries Comparators / Profile Projectors in The Netherlands, Belgium, Luxemburg, Germany, Austria and Switzerland

Molenaar Optics VOF · P.O. Box 2, 3700 AA Zeist, Netherlands,
Tel.: +31 30 6951038, Fax: +31 30 6961348, info@molenaar-optics.nl, www.molenaar-optics.com
NL-1

Producer

Accurate and fast 3D measurement for large volume parts using digital photogrammetry.

NTI · 32 Route de Seichebrieres, 45530 Vitry aux Loges, France,
Tel.: +33 238 593 051, Fax: +33 238 593 097, info@nti-measure.com, www.nti-measure.com
F-4

Producer, Solution Provider

With its headquarters in Kyoto, Japan, Omron Corporation is a global leader in the field of automation. Established in 1933, Omron has more than 35,000 employees in 34 countries working to provide products and services to customers in a variety of fields, including industrial automation, electronic components industries and healthcare. The European organization has its own development and manufacturing facilities, and provides local customer support in all European countries.

Omron Europe BV · Wegalaan 67 – 69, 2132 JD Hoofddorp, Netherlands,
Tel.: +31 23 568 13 00, Fax: +31 23 568 13 88, info@eu.omron.com, www.industrial.omron.eu
NL-2

Producer

Optics Balzers is the trusted partner for high quality thin film coatings and optical components for the photonics industry. As a global leader in optical thin-film components and subassemblies, they focus on selective markets such as automotive, biophotonics, advanced lighting, sensors and imaging. The company possesses a comprehensive know-how in optical thin film coatings, glass processing, patterning, sealing, and optical subassemblies.

Optics Balzers AG · Neugrüt 35, 09496 Balzers, Liechtenstein,
Tel.: +42 3 388 9200, info@opticsbalzers.com, www.opticsbalzers.com
FL-1

Producer

Opto Engineering designs and manufactures optical systems for imaging, metrology, sensors, projection and lasers.
Nowadays Opto Engineering is well recognized as one of the best regarded suppliers of machine vision optics and its specific and continuous focusing in telecentric lens design and manufacturing has made Opto Engineering "The Telecentric Company".

Opto Engineering Srl · via Cremona, 29/2, 46100 Mantova, Italy,
Tel.: +39 0376 263525, Fax: +39 0376 262432, info@opto-engineering.com, www.opto-engineering.com
I-2

Distributor

Parameter AB, with over 20 years in the business, is the largest Machine Vision distributor and represents the market leaders in cameras, frame grabbers, lenses, illumination and software for Machine Vision in the Nordic and Baltic countries, Poland and Iceland.We offer consultative services and training to your Machine Vision professionals.Our customers are also market leaders in many different branches, such as paper, wood, bio medicine, electronics, food and manufacturing.

Parameter AB · Sandhamnsgatan 63C, 102 52 Stockholm, Sweden,
Tel.: +46 855511000, michael.cohn@parameter.se, www.parameter.se
SE-1

Distributor, Producer

Photonic Products is a manufacturer of custom designed laser diode modules and laser diode assemblies and an authorised distributor of high performance, premium quality industrial laser diodes and high power lasers from the top Japanese laser diode manufacturers: Sanyo, Opnext and Sony, and precision optical lenses from Panasonic to OEMs in the industrial, medical, scientific and defence markets.

Photonic Products Ltd · Sparrow Lane, Hatfield Broad Oak CM22 7BA, United Kingdom,
Tel.: +44 1279 717 170, Fax: +44 1279 717 171,
sales@photonic-products.com, www.photonic-products.com
UK-9

Producer

Photron, designer and manufacturer of high speed imaging systems sets new standards with high frame rates, image resolution and light sensitivity. The new Fastcam SA-1 system provides MegaPixel image resolution at frame rates up to 5,400 fps and a maximum recording rate of 675,000 fps with reduced image resolution. This unique high speed imaging performance together with an unequalled light sensitivity makes the Fastcam SA-1 the new system of choice for a wide variety of applications.

Photron (Europe) Ltd · The Barn, Bottom Road, West Wycombe, Bucks, HP14 4BS, United Kingdom,
Tel.: +44 1494 481011, Fax: +44 1494 487011, ahilton@photron.com, www.photron.com
UK-10

Producer

Integrated machine vision cameras Visi5000, Visi40 paper industry: VisiEdge web edge tracking sensor, VisiEye web break detector steel industry: VisiLine Centring system, width measurement.

SKS Vision Systems OY · P.O. Box 353, 40101 Jyväskylä, Finland,
Tel.: +358 20 764 8960, Fax: +358 20 764 8999, sales@visionsystems.fi, www.visionsystems.fi
FI-1

Producer

Sony Europe's Image Sensing Solutions division has an in-depth range of industry leading analog and digital component cameras and image sensing products. Sony ISS recently announced its second generation smart cameras, with a 3X performance improvement. These highly flexible color cameras extend the smart camera concept to several new markets, such as security, agriculture and traffic control. Sony ISS has also added GigE modules, for long lead applications, to its portfolio, complementing its IEEE1394 offering.

Sony United Kingdom Limited · The Heights, Brooklands, KT13 0XW Weybridge, Surrey, United Kingdom,
Tel.: +33 1 55 90 35 12, Fax: +33 1 55 90 35 17, zone@eu.sony.com, www.sonybiz.net/vision
UK-11

Producer

Textile quality inspection, Blueberry Color Sorter, Narrow Fabric Inspection.

SPC Company b.v. · Vimmerik 28, 05253 CB Nieuwkuijk, Netherlands,
Tel.: +31 73 5131 188, Fax: +31 73 5131 189, sales@spccompany.nl, www.spccompany.nl
NL-3

Distributor

High brightness LED lights for machine vision with all lights available from UV through to IR, microscopes, camera housings, filters.

Special Application Products Ltd · Unit 5 Manor Farm Business Centre, Ipswich IP9 2TD, United Kingdom, Tel.: +44 1473 327 732, Fax: +44 8701 400 163, sales@sapltd.co.uk, www.sapltd.co.uk UK-12

Producer

Sundance modular and customizable COTS hardware and software systems are easy to reconfigure to suit all high-speed I/O and signal processing applications, enabling the rapid prototyping and development of embedded systems.

Sundance Multiprocessor Technology Ltd · "Ciltern House", HP5 1PS Waterside, Chesham, United Kingdom, Tel.: +44 1494 793167, Fax: +44 1494 793168, DVIP@Sundance.com, www.sundance.com UK-13

Producer

Tattile srl was set up on 7th January 1988 by a team with experience in quality control, providing solutions to engineering problems connected with automated production lines and quality control.Tattile produce a wide range of cameras, smart cameras and embedded analyzers.

Tattile Srl · Via Gaetano Donizetti 1-3-5, 25030 Mairano (BS), Italy, Tel.: +39 030 97000, Fax: +39 030 97001, sales@tattile.com, www.tattile.com I-3

Producer

Tordivel AS is a global machine vision company. Our unique and independent Scorpion Vision Software is the platform for world class vision systems and OEM solutions. Scorpion Vision Software is a powerful, flexible and extremely expeditious software tool for industrial vision. The most advanced 2D and 3D solutions are made without any programming. Scorpion Vision Software is distributed through a global network of partners. Polytec GmbH is the German partner.

Tordivel AS · Storgata 20, 00184 Oslo, Norway, Tel.: +47 2315 870 0, Fax: +47 2315 870 1, office@toridvel.no, www.scorpionvision.com NO-1

Producer

"The Seal Inspector" is controlling that the seals of food packages are without impurities. "The Package Inspector" is capable of a unique inspection of packages, like controlling the artwork, dimensions, overmoulding and gaps between labels. The solution approaches the packing industry which needs extensive visual package control. Both solutions are very competitive on the European market place.

TriVision · Havnegade 23, 05000 Odense, Denmark, Tel.: +45 28353135, Fax: +45 63154709, korsgaard@trivision.dk, www.trivision.dk DK-3

Producer

TVI's 3CCD Cameras
TVI's cameras consist of the 3CCD color line scan cameras from low to high resolution (from 512 to 4096 pixels per color), from medium to high speed (from 20 to 40 MHz) and from normal RGB cameras to the cameras where one color channel is for near IR.TVI's 3CCD camera is a perfect choice for the print and film inspection, demanding sorting applications and quality control where the quality of the color image and the reliability are the key issues.

TVI Vision · Asentajankatu 3, 00880 Helsinki, Finland, Tel.: +358 207 579 518, Fax: +358 207 579 519, www.tvivision.com FI-2

Integrator, Solution Provider

Machine Vision Systems supplier to OEM's and end users. Specialist in Inspection systems for PV solar cells, closures for bottles and liquid containers, Baby diapers.

Univision s.r.l. · via Appiani 3, 20038 Seregno, Italy, Tel.: +39 0362 600201, Fax: +39 0362 600129, info@univision.it, www.univision.it I-4

Machine Builder/OEM

Videometer is a leading provider of spectral imaging systems and instruments for laboratory as well as in-line applications within e.g. food, pharma, cosmetic, medical, and materials industries.

Videometer A/S · Lyngso Allé 3, 02970 Horsholm, Denmark, Tel.: +45 45761077, Fax: +45 45761041, info@videometer.com, www.videometer.com DK-4

Distributor, Producer

The trilogy of light, lens and filter is crucial for a good working vision system. We offer a wide range of illumination, lenses and filter solutions. Our products are used in the industrial Machine Vision industry, Traffic Automation (i.e. license plate recognition) and Security Business. We also customize standard products to suit individual customer requirements. VLT – creating optical solutions

Vision Light Tech · Protonenlaan 22, 05405 NE Uden, Netherlands, Tel.: +31 413 260067, Fax: +31 413 260938, info@vlt.nl, www.visionlighttech.com NL-4

Distributor

Leading Italian distributor of machine vision components. Cognex, Sony, E2V and more.

Visionlink s.r.l. · via Cristoforo Colombo 22, 20038 Seregno, Italy, Tel.: +39 0362 600 202, Fax: +39 0362 600 129, info@visionlink.it, www.visionlink.it I-5

Distributor, Integrator, Solution Provider

We are a systems integrator with over 25 years of experience in building custom machine vision systems.

Vistek Machine Vision and Automation AS · Kemal Nehrozoglu caddesi, 41480 Kocaeli, Turkey, Tel.: +90 262 6788 902, Fax: +90 262 6788 906, info@vistekas.com, www.vistekas.com TR-2

Producer, Research Facility, Solution Provider

Xenics is the leading developer of innovative infrared detection solutions for a wide range of applications. Xenics designs, manufactures and sells infrared detectors and cameras, both line-scan and 2-D, covering the infrared wavelength ranges from 0.4 to 14 micrometers. In addition, Xenics delivers custom products according to the agreed specification and planning.

Xenics · Ambachtenlaan 44, 03001 Leuven, Belgium, Tel.: +32 16 38 99 00, sales@xenics.com, www.xenics.com BE-5

Producer

Allison Park Group, Inc. manufactures camera and lighting enclosures for harsh environments including: explosion proof, food (FDA), and corrosive washdown. We offer custom and OEM solutions, additionally we manufacture several lines of Pan & Tilt mounts that work with most cameras and light sources.

Allison Park Group, Inc. · 4055 Alpha Drive, 15101 Allison Park, PA, United States of America,
Tel.: +1 412 487 8211, Fax: +1 412 486 3157, sales@apgvision.com, www.apgvision.com
PA-1

Producer, Solution Provider

Asylum Research is the technology leader for atomic force and scanning probe microscopy for both materials and bioscience applications. Asylum's product line offers imaging and measurement capabilities for a wide range of samples, including advanced techniques such as electrical characterization, high voltage piezoresponse force microscopy, magnetic force microscopy with our unique variable field module, quantitative nanoindenting, and a wide range of environmental accessories and application-ready modules.

Asylum Research · 6310 Hollister Ave., 93117 Santa Barbara, CA, United States of America,
Tel.: +1 805 696 6466, Fax: +1 805 696 6444, sales@asylumresearch.com, www.AsylumResearch.com
CA-1

Distributor

Since 1987, Bock Optronics has been a Canadian distributor of optical and electronic imaging technologies for machine vision, NDT, quality inspection, R&D, medical public safety. Having assembled an impressive line of products for vision oriented applications, we endeavour to maintain a reputation for quality and excellence in both the products we represent and in our customer support.

Bock Optronics Inc. · 14 Steinway Blvd., Suite 7, M9W 6M6 Toronto, ON, Canada,
Tel.: +1 416 674 2804, Fax: +1 416 674 1827, sales@bockoptronics.ca, www.bockoptronics.ca
ON-1

About Point Grey Research, Inc.

Office(s)
Point Grey Research GmbH
Schwieberdinger Straße 60
71636 Ludwigsburg
Germany
Tel.: 49 7141 488817 0
Fax: 49 7141 488817 99
eu-sales@ptgrey.com

Management
Vladimir Tucakov,
Director Sales & Marketing

Joerg Clement,
Business Development Manager Europe

Foundation
1997

Staff
51–100

Products
Cameras

Applications
Character Recognition, Digitalization, High Speed Analysis, Inspection Piece Parts, Material Testing, Metrology 3D, Part Identification, Particle Analysis, Robot Vision 2D, Robot Vision 3D, Symbol Recognition

Industries served
Automotive and Suppliers, Electronics/Semiconductors, Energy/Water/Solar Technology, Foodstuffs/Beverages, Glass/Ceramics, Mechanical Engineering/Line Building, Medical Technology, Metal, Packaging, Paper/Wood, Pharmaceuticals/Cosmetics/Chemicals, Plastics, Precision Engineering/Optics/Machine Vision, Traffic/Logistics

Associations
AIA, EMVA, Other

Regions served
Asia, Europe, Latin America, North America

POINT GREY

Point Grey Research, Inc.
12051 Riverside Way
V6W 1K7 Richmond, BC
Canada
Tel.: +1 604 242 9937
Fax: +1 604 242 9938
info@ptgrey.com
www.ptgrey.com

See our ad on page Inside Front Cover BC-1

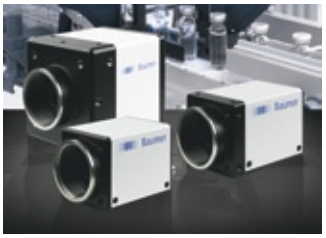
Point Grey Research, Inc. is a worldwide leader in the development of advanced digital camera technology products for machine vision, industrial imaging, and computer vision applications. Based in Richmond, BC, Canada, Point Grey designs, manufactures and distributes IEEE-1394 (FireWire) and USB 2.0 cameras that are known for their excellent quality, performance and ease of use; and will introduce new GigE and Camera Link cameras in 2010. A broad range of hardware, software and mechanical engineering skills has allowed Point Grey to successfully bring innovative and groundbreaking products to market. This drive for innovation has led to many industry firsts, including both the first and the world's smallest 1394b digital camera. Since its founding in January of 1997, the company's approach to product pricing, quality control, and customer service has attracted thousands of customers worldwide, and its organic growth through product sales has enabled the company to expand significantly without any outside investment. Point Grey currently employs more than 90 people worldwide, and has a German subsidiary that provides sales and support services to customers in Europe, Africa and Israel. The company has also established a strong network of distributors in Japan, Korea, China, Singapore and Taiwan.

End-to-End Imaging Solutions

A critical component of any vision system is the speed and reliability of the imaging pipeline, from light hitting the image sensor to data reaching the host system. Point Grey Research has taken ownership of the entire pipeline, and over the last 12 years has created a diverse portfolio of digital cameras, peripheral components, and software. Point Grey offers more than 75 different single-lens, stereo, and 360-degree spherical digital cameras, with a variety of monochrome and color CCD and CMOS image sensors from VGA to 5 megapixels. Many product families also offer board-level or customized options for specific OEM applications. In addition, Point Grey has introduced its FirePRO line of professional FireWire hubs, repeaters and host adapter cards, which are designed to maximize the effectiveness and reliability of the entire imaging pipeline. All Point Grey cameras comply with the IIDC v1.31 specification, which allows them to be used with many third-party software packages, such as those from Cognex, Matrox, MVTec, and National Instruments. Also included with every camera is the FlyCapture software development kit (SDK), a complete software package that includes device drivers, a full software API library, demo programs and C/C++ example source code.

Distributor

Baumer has established itself as the leading company for vision technologies. Its wide range of digital cameras, vision sensors and further image processing products with cutting-edge technologies provides high quality for industrial, scientific and medical applications. Next to vision products Baumer is known as the premier innovator for precision sensors, motion control, identification solutions, gluing systems and process instrumentation for the automation market.



Baumer

Baumer Ltd.
122 Spring Street, Unit C-6
06489 Southington, CT
United States of America
Tel.: +1 8606212121
Fax: +1 8606286280
sales.us@baumer.com
www.baumer.com

CT-1

Solution Provider

Cimetrix offers powerful machine modeling and motion-control software products for high volume vision-guided control applications. Code can reduce time to market by up to 50 % by offering both a powerful, offline simulation development environment (Cimulation) and a robust, realtime motion and I/O control system (Cimcontrol).

Cimetrix Inc. · 6979 S. High Tech Drive, Salt Lake City, UT 84047, United States of America, Tel.: +1 801 256 6500, Fax: +1 801 256 6510, sales@cimetrix.com, www.cimetrix.com

UT-1

Producer

Coherent Canada is a leading designer and manufacturer of structured light lasers. Our Lasiris brand of industrial packaged diode lasers are used in industrial inspection and 3-D machine vision industries and more recently have been introduced into biomedical and military markets for specialized applications.

Coherent Canada · 275 Kesmark, H9B3J1 Montreal, QC, Canada, Tel.: +1 514 685 1005, lasers@stockeryale.com, www.coherent.com

QC-1

Research Facility, Solution Provider

Develops, manufactures, advanced 3D & 2D metrology & machine vision software, hardware, systems. Industrial, medical, government, applications. Unique technologies for micron-level measurement, defect detection, image analysis & process control information. All types of image sensors used. Unique 3D imaging sensors developed/produced. We provide modules, subsystems and complete system solutions. Accuracy, repeatability, high-speed operation and environmental reliability are provided.

Coherix, Inc. · 3980 Ranchero Drive, 48108-2775 Ann Arbor, MI, United States of America, Tel.: +1 734 922 40, Fax: +1 734 761 9193, rons@coherix.com, www.coherix.com

MI-1

Producer

Components Express, Inc is an authorized manufacturer and global supplier of CameraLink and related cable assemblies serving the Machine Vision Industry. CEI's extensive product development & engineering support is recognized throughout the industry as being the forefront in cabling technology. Specializing in both custom and standard applications. Come visit us today and see why Components Express, Inc. is the worlds' greatest machine vision cable manufacturer!

Components Express, Inc. · 10330 Argonne Woods Drive Suite 100, 60517 Woodridge, IL, United States of America, Tel.: +1 630 257 605, Fax: +1 630 257 603, cei@componentsexpress.com, www.componentsexpress.com

IL-1

Producer

Manufacturer of flat panel display systems, both computers and monitors, for the OEM and endusers in an array of industries and applications. Hazardous Area systems carry full agency approvals (Class I, Zone 1 & 2, etc.); NEMA-rated, Stand- Alone systems suit plant floor or commercial environments. Panel- Mount and Open-Frame systems offer multiple display sizes and up to 2.0 GHz Intel Core 2 Duo processors. Touchscreens are available on most of our products.

Computer Dynamics · 7640 Pelham Road, Greenville, SC 29615, United States of America, Tel.: +1 864 627 8800, Fax: +1 864 675 0106, CDIsales@gefanuc.com, www.cdynamics.com

SC-1

Producer

CyberOptics Semiconductor is an industry authority on frame grabbers and machine vision applications. Customers enjoy a built-in connection to live engineering and installation support experts, as well as to online frame grabber expertise in the form of selection guides, white papers, and indepth technical information. For in-depth information on Imagenation frame grabbers, go to www.imagenation.com.

CyberOptics Semiconductor, Inc. · 13555 SW Millikan Way, Beaverton, OR 97005, United States of America, Tel.: +1 503 495 2200, Fax: +1 503 495 2201, csinfo@cyberoptics.com, www.imagenation.com

OR-1

Producer

Comprising Dalsa's Digital Imaging division offers Machine Vision components to OEMs and end users – the widest range of machine vision components in the world. From industry-leading image sensors through powerful and sophisticated cameras, frame grabbers, vision processors and software to easy-to-use vision appliances and custom vision modules, our innovative technology helps give you competitive advantage in your imaging application, whatever it may be.

Dalsa · 605 McMurray Road, N2V-2E9 Waterloo, ON, Canada, Tel.: +1 519 886 6000, Fax: +1 519 886 8023, sales.americas@dalsa.com, www.dalsa.com/mv

ON-2

Distributor

High speed digital cameras for slow motion instant replay and motion analysis. In the lab or on the production line.

Digital West Imaging · 450 Mountain View Road, El Cajon, CA 92021, United States of America, Tel.: +1 866 593 1900, Fax: +1 966 593 1901, sales@DigitalWestImaging.com, www.DigitalWestimaging.com

CA-2

Producer

Pan-tilt devices for cameras, lasers, antennas, machine vision.

Directed Perception · 890C Cowan Road, Burlingame, CA 94010, United States of America, Tel.: +1 650 692 3900, Fax: +1 650 692 3930, sales@dperception.com, www.DPerception.com

CA-3

Solution Provider

Dunkley designs and builds turnkey vision systems.

Dunkley International Inc. · 1910 Lake St., Kalamazoo, MI 49001, United States of America, Tel.: +1 269 343 5583, Fax: +1 269 343 5614, ekenneway@dunkleyintl.com, www.dunkleymachinevision.com

MI-2

Producer

Epix, Inc. designs and manufactures frame grabbers, cameras, image acquisition and processing software, camera kits, and video to disk computer systems for machine vision, medical imaging, and high speed video analysis applications. We provide superior customer support from the initial purchase decision through image analysis. We can create custom cameras, frame grabbers, and software for your application.

Epix, Inc. · 381 Lexington Drive, Buffalo Grove, IL 60089-6934, United States of America, Tel.: +1 847 465 1818, Fax: +1 847 465 1919, epix@epixinc.com, www.epixinc.com IL-2

Producer

Manufactures high-speed megapixel digital cameras and systems based on state-of-the-art imagers and having high-speed, scalable, integrated FGPA's, processors, and memory subsystems. These features enable stand-alone recording or high-speed in-camera image processing. Also, FastVision offers lossless or lossy compressed image recording. Advanced IP and optimized software is available that can be added to allow standalone processing modes or integration.

FastVision · 131 D.W. Highway #529, 03060 Nashua, NH, United States of America, Tel.: +1 603 891 4317, Fax: +1 603 891 1881, sales@fast-vision.com, www.fast-vision.com NH-1

Producer

FTI designs and manufactures standard and custom fiberoptic lighting components including light sources and fixturing, for front, back, and oblique lighting required by area and line scanning applications. The company distributes standard products thru traditional distribution channels, while working directly with integrators and OEMs for custom designed solutions.

Fiberoptics Technology · 1 Quassett Road, Pomfret, CT 06258, United States of America, Tel.: +1 860 928 0443, Fax: +1 860 928 7664, sgiamundo@fiberoptix.com, www.fiberoptix.com CT-2

Producer

FJW manufactures self-contained handheld Find-R-Scope Infrared Viewers, Ultraviolet Viewers, and Thermal Cameras, plus Near-Mid IR Cameras. These products convert IR and UV to visible, allowing the user a clear view to inspect sources and images which are not apparent to the naked eye. Use the handheld Find-R-Scope viewer to determine if using IR imaging can provide improved contrast. Models sensitive from 180 nm (UV) to as long as 2200 nm, plus 8-14 microns. Also great for aligning laser systems.

FJW Optical Systems, Inc. · 322 N Woodwork Ln, Palatine, IL 60067-4933, United States of America, Tel.: +1 847 358 2500, Fax: +1 847 358 2533, irsales@findrscope.com, www.findrscope.com IL-3

Integrator, Solution Provider

FSI Technologies Inc. provides machine vision systems and solutions, specialized lighting, and related expertise and consultant services. Systems include FireCube and other units powered by Neuro- Check, as well as DSP-based units for inspection of assemblies, agricultural, cast, molded, machined, and electronic products. Our Assured Path to Success program has a 100 % success rate on even the toughest applications. Since 1959.

FSI Technologies Inc. · 668 Western Ave., 60148 Lombard, IL, United States of America, Tel.: +1 630 932 9380, Fax: +1 630 932 0016, info@fsinet.com, www.fsinet.com IL-4

Producer

Designs and manufactures highperformance Gigabit Ethernet CCD/CMOS cameras for ITS, military, homeland security, machine vision, medical and scientific markets. Also specializes in neural network smart cameras as standalone systems. GigE Vision compliance ensures compatibility with third-party hardware and software to simplify integration. Serving OEMs, end-users and research institutions worldwide. Products are manufactured in the U.S.A.

Gevicam Inc. · 673 S. Milipitas Blvd, Milpitas, CA 95035, United States of America, Tel.: +1 408 262 5772, Fax: +1 408 262 0962, info@gevicam.com, www.gevicam.com CA-4

Producer

Manufacturer of standard and custom camera cable assemblies include CameraLink, Mini Camera Link, FireWire, USB, GigE and other analog and digital cable assemblies. Highflex and industrial grade cable assemblies are available for robotic and other high flex applications. Additional products include bulk cable, power supplies, and fiber optic extenders.

Intercon 1 · 7746 Goedderz Rd., Ste 110, 56425 Buxter, MN, United States of America, Tel.: +1 218 828 3157, Fax: +1 218 828 1096, intercon@nortechsys.com, www.intercon-1.com MN-1

Producer

Leica Microsystems is a leading global developer and manufacturer of a broad range of innovative, high-tech, precision optical systems for the imaging, measurement, and analysis of microstructures. The company offers system solutions for the research and development of raw materials, industrial quality assurance, and many more applications. Leica Microsystems is represented in over 100 countries with 9 manufacturing facilities in 7 countries, sales and service organizations in 20 countries.

Leica Microsystems, Inc. · 2345 Waukegan Road, 60015 Bannockburn, IL, United States of America, Tel.: +1 847 405 123, Fax: +1 847 405 164, info@leica-microsystems.com, www.leica-microsystems.com IL-5

Producer

Electro-optics Modules; Polygonal mirrors; Polygonal Scanners; Precision Motors; High-speed Spindles.

Lincoln Laser Company · 234 East Mohave, Phoenix, AZ 85004, United States of America, Tel.: +1 602 257 0407, Fax: +1 602 257 0728, bcmcgrath@lincolnlaser.com, www.lincolnlaser.com AZ-1

Producer, Solution Provider

LMI Technologies Inc. specializes in leading edge machine vision technologies. Founded in 1976, LMI developed much of the 3D machine vision industry, accumulating more than 100 patents. LMI is recognized for designing and manufacturing sensors for specific vertical market applications under the Sensors That See brand. LMI also provides custom design services to help our customers design and build unique machine vision and robotic solutions.

LMI Technologies Inc. · 1673 Cliveden Avenue, V3M 6V5 Delta, BC, Canada, Tel.: +1 604 636 1011, Fax: +1 604 516 8368, Info@lmitechnologies.com, www.lmitechnologies.com BC-2

Producer

Matrox Imaging is an established and trusted supplier to top OEMs and integrators involved in the manufacturing, medical diagnostic and security industries. The components delivered include cameras, interface boards and processing platforms, all designed to provide optimum price-performance within a common software environment.

Matrox Imaging · 1055 St. Regis Blvd., Dorval, Quebec H9P 2T4, Canada, Tel.: +1 514 822 6020, Fax: +1 514 822 6273, imaging.info@matrox.com, www.matroximaging.com QC-2

Producer

LED Lighting for machine vision and custom LED lighting design services.

Metaphase Technologies, Inc. · 3412 Progress Drive (unit C), Bensalem, PA 19020, United States of America, Tel.: +1 215 639 8699, Fax: +1 215 639 0977, info@metaphase-tech.com, www.metaphase-tech.com PA-2

Producer

Manufacturer of precision optical filters, lenses and lighting components for industrial imaging applications, supplying to both end users and OEMs. An extensive range of types and sizes are available for same day shipping, both mounted (assembled) and unmounted. We also offer custom fabrication of all configurations and types of precision optical glass, plastic and metal mounting mounting components. Emphasis is on same day availability of CCTV lenses and related accessories, LED lighting-compatible filters and filter kits designed specifically for factory inspection/automation.

Midwest Optical Systems, Inc. · 322 N. Woodwork Lane, 60067 Palatine, IL, United States of America, Tel.: +1 847 359 3550, Fax: +1 847 359 3567, midwest@midopt.com, www.midopt.com IL-6

Distributor, Integrator, Solution Provider

Automated Inspection and Measurement Systems utilizing machine vision, laser sensors, noncontact sensors. Defect Detection, Dimensional Measurement, Color Analysis, Surface Inspection, Line Scan systems.

msiVision · 5 Herbert Drive, Suite 1N, 12309 Latham, NY, United States of America, Tel.: +1 518 346 7136, Fax: +1 518 346 4134, info@msivision.com, www.msivision.com NY-1

Producer, Solution Provider

Navitar is comprised of a network of companies that design, develop, manufacture and distribute precision optical solutions. Navitar Machine Vision supplies optics, opto-mechanical sub-assemblies and opto-electronic system solutions for machine vision, automation, assembly, electronic imaging, testing, measuring, and inspection. Our Special Optics division specializes in rapidly designing, prototyping, and manufacturing innovative optical systems for a variety of industries.

Navitar · 200 Commerce Drive, 14623 Rochester, NY, United States of America, Tel.: +1 585 359 4000, Fax: +1 585 359 4999, info@navitar.com, www.navitar.com NY-2

Producer

Newnex creates long distance connection solutions for machine vision and inspection applications through fiber, CHTS and Coax Cables for 1344 GigE and USB 2.0 etc. Newnex also manufactures high flex, angled, locking and custom design cables.

Newnex Technology Corp. · 1231 Alderwood Ave., Sennysale, CA 94089, United States of America, Tel.: +1 408 749 1480, Fax: +1 408 749 1963, information@newnex.com, www.newnex.com CA-5

Producer

StreamPix digital video is recording software for single or multiple cameras simultaneously. Includes support for a wide variety of Firewire A or B, USB 2, GigE and CameraLink cameras and frame grabbers using original vendor API's. Supports time stamping, synchronization between multiple cameras, bayer conversion, IrigB and data acquisition. Compatible with various compression codecs and 3D Lut. Acquire at up to 500 fps x 1,280 x 1,024 8 bits to disk from a single or two cameras. NorPix also provides turnkey systems including software, hardware, triggering and Irigb timing.

Norpix, Inc.
1751 Richardson St., Suite 6117
H3KIG6 Montreal, QC
Canada
Tel.: +1 514 846 0009
Fax: +1 514 846 0117
sales@norpix.com
www.norpix.com
QC-3

Solution Provider

Optel Vision develops, manufactures, and integrates innovative, comprehensive packaging line inspection systems for numerous industries.

Optel Vision · 2680, boul. du Parc Technologique, G1P 4S6 Quebec City, QC, Canada, Tel.: +1 418 688 334, Fax: +1 418 6889 397, info@optelvision.com, www.optelvision.com QC-4

Producer

Optical Research Associates (ORA) is the world's leading developer of optical design software, providing users with CODE V for imaging design and Light- Tools for illumination design. ORA is also the largest independent supplier of optical design and engineering services, with more than 4,000 completed projects since the company was founded in 1963.

Optical Research Associates · 3280 E Foothill Blvd Ste 300, 91107 Pasadena, CA , United States of America, Tel.: +1 626 795 9101, Fax: +1 626 795 9102, info@opticalres.com, www.opticalres.com CA-6

Integrator

Since 2000, Orus Integration has been developing innovative solution in automation by vision. In many sectors, machines developed by Orus are used for quality control, process control, metrology and data acquisition.

Orus Integration Inc · 1109 Hwy 13, H7W 5J8 Laval, QC, Canada, Tel.: +1 450 688 3151, Fax: +1 514 221 2026, ldicaire@orusintegration.com, orusintegration.com QC-5

Producer

Pleora Technologies Inc. is a global supplier of Ethernet video connectivity products for the broadcast, medical, machine vision and security/surveillance industries. Pleora´s award-winning iPort and EtherCast product families transport imaging and video data in real time over low-cost Ethernet Connections with extremely high performance. Pleora, a Frost and Sullivan Product Innovation Award-winner, is headquartered in Ottawa, Canada.

Pleora Technologies · 359 Terry Fox Drive Suite 230, Kanata, Ontario, K2K 2E7, Canada, Tel.: +1 613 270 0625, Fax: +1 613 270 1425, info@pleora.com, www.pleora.com ON-3

Producer

PPT Vision, Inc. designs, manufactures, and markets machine vision based intelligent cameras used for automated inspection, measurement, and guidance applications. Our Impact intelligent camera product line enables manufacturers to realize significant economic paybacks by increasing the quality of manufactured parts and improving the productivity of manufacturing processes. Our solutions are primarily targeted at providing manufacturers with 100% inspection in high speed, discrete part manufacturing applications.

PPT Vision · 6301 Old Shakopee Road, 55438 Bloomington, MN, United States of America, Tel.: +1 952 996 9500, Fax: +1 952 996 9501, sales@pptvision.com, pptvision.com MN-2

Solution Provider

Pressco Technology is a world leader and pioneer in advanced on-line computer automated vision/sensing inspection and process analysis products and services. All systems are individually engineered and configured to solve customer's challenges and unique applications from our constantly growing library of standard modules. Our primary core markets comprise the global food, beverage, and container industries that utilize very high speed techniques to produce discrete components.

Pressco Technology Inc. · 29200 Aurora Road, 44139 Cleveland, OH, United States of America, Tel.: +1 440 498 2600, sales@pressco.com, www.pressco.com OH-1

Producer

Rad-icon Imaging Corporation is a leading provider of high-performance CMOS image sensors and cameras for the digital radiography market worldwide. Our products enable medical practitioners, industrial manufacturers, and scientific researchers to create superior image quality, high resolution, and large active area images based on our CMOS active pixel sensor (APS) technology. Rad-icon is a division of DALSA Corporation and is based in Santa Clara, CA.

Rad-icon Imaging Corporation · 888 East Arques Avenue, 94085 Sunnyvale, CA, United States of America, Tel.: +1 408 736 6000, sales@rad-icon.com, www.rad-icon.com CA-7

Producer

Servo-Robot has been producing laser vision systems for robotic and hard automation manufacturing processes for more than 25 years. Servo-Robot is a recognized leader in the development and improvement of novel sensing processes associated with arc and high energy beam welding and welds and joints inspection. Servo-Robot also applies its advanced and patented 3-D laser vision technics and other hybrid sensing technologies.

Servo-Robot Inc. · 1370 Hocquart, J3V 6E1 St-Bruno, QC, Canada, Tel.: +1 450 653 7868, Fax: +1 450 653 7869, sales@servorobot.com, www.servorobot.com QC-6

Producer

Smart Vision Lights features Intelligent Driver in every light; a separate driver is no longer needed, making additional wiring unnecessary. SVL designs, and manufactures a line of products that apply the benefits of high current LED's for use in machine vision applications. All lights use standard M12 cables and 24VDC for operation. SVL manufactures: Connect-A-Light, Brick Light, Prox Light, Over Drive Lights, and the new Easy Mount Ring Light family.

Smart Vision Lights · 1800 Holton Rd Suite D 353, 49445 Muskegon, MI, United States of America, Tel.: +1 231 722 1199, Fax: +1 231 722 9922, bobby@smartvisionlights.com, www.smartvisionlights.com MI-3

Producer

Spectrum Illumination is the leading supplier of high output LED lighting for the Machine Vision Market. Spectrum Illumination was the first company to bring high output LED's to the market and we are still the only company with a full product line utilizing that technology. Spectrum Illumination has over 100,000 standard products with all different variations. Most standard products are available to ship within days of receiving a purchase order.

Spectrum Illumination · 5114 Industrial Park Rd., 49437 Montague , MI, United States of America, Tel.: +1 231 894 4590, Fax: +1 231 894 4582, sales@spectrumillumination.com, www.spectrumillumination.com MI-4

Producer

StockerYale, Inc., headquartered in Salem, New Hampshire, is an independent designer and manufacturer of diode-based laser modules and LED systems for industry leading OEMs. In addition, the Company distributes premium diodes for Opnext, Sanyo & Sony. The Company serves a wide range of markets including the machine vision, industrial inspection, defence, sensors, and medical markets. StockerYale has offices and subsidiaries in the U.S., Ireland, and Europe.

StockerYale

StockerYale Inc.
32 Hampshire Road
03079 Salem, NH
United States of America
Tel.: +1 603 893 8778
NBolster@stockeryale.com
www.stockeryale.com
NH-2

Solution Provider

Fully automated turnkey solutions for non-contact 3D measurement and inspection. SPG Data 3D software offers a timely solution to an industry that seeks to improve production processes, reduce the number of rejects and upgrade quality control.

SPG Data 3D Corporation · 2151 Leonard de Vinci, Ste-Julie, Quebec J3E 1Z3, Canada, Tel.: +1 450 922 3515, Fax: +1 450 922 3510, sales@spgdata3d.com, www.spgdata3d.com QC-7

Producer

Sunex is a world leader in wideangle miniature lenses for digital cameras. Capabilities include design, development, and production of lenses, optical low-pass filters, IR cut-off filters, and systems for CMOS/CCD image sensors. Provides optical design services and custom product development. Additional capabilities include molding plastics, prototype development, and high-volume production.

Sunex, Inc. · 5963 La Place Court, Suite 3092, Carlsbad, CA 92008, United States of America, Tel.: +1 760 602 0988, Fax: +1 760 602 0681, sales@sunex.com, www.sunex.com CA-8

Producer

Supplier of CCTV Optics with the emphasis on long range surveillance. Optics from 2.5 mm to 2,000 mm employing the latest technological advances including aspherical elements, LD Glass and IR coatings.

Tekstar Optical Inc. · 270 Kohr Rd., Kings Park, NY 11754-1237, United States of America, Tel.: +1 631 663 3558, Fax: +1 631 269 5368, info@tekstaroptical.com, www.tekstaroptical.com NY-3

Distributor, Integrator

Sales agency and systems integrator specializing in photonics and related products and services.

Vega Technology Group · PO Box 80526, 44708 Canton, OH, United States of America, Tel.: +1 330 754 2506, Fax: +1 330 754 2507, admin@vegatcgroup.com, www.vegatcgroup.com OH-2

Integrator, Solution Provider

Manufactures stock and custom vision systems including color and texture-based inspection, particle analysis and sieve certification, print verification and signature recognition, and license plate readers for vehicular access control. Specializes in custom software development, lighting and optics solutions, and color and grayscale machine vision system integration.

Vision Machines Inc. · PO Box 447, 01730 Bedford, MA , United States of America, Tel.: +1 781 275 2020, Fax: +1 781 275 2028, info@vision-machines.com, www.vision-machines.com MA-1

Producer

Vision Research designs and manufactures high-speed digital imaging systems used in applications including defense, automotive, engineering, science, medical research, industrial manufacturing and packaging, sports and entertainment, and digital cinematography for television and movie production. Vision Research digital high-speed cameras add a new dimension to the sense of sight, allowing the user to see details of an event when it's too fast to see, and too important not to.

Vision Research · 100 Dey Rd., 07470 Wayne, NJ, United States of America, Tel.: +1 973 696 4500, Fax: +1 973 696 0560, phantomn@visionresearch.com, www.visionresearch.com NJ-1

Distributor

Adept Electronic Solutions specialises in the supply and support of machine vision (imaging) systems and components throughout Australia and New Zealand. Adept provides all components required for computer vision and automated inspection. Adept has the broadest range of cameras, optics and lighting from the world's leading manufacturers. Our customers receive timely local support from knowledgeable vision engineers at Adept.

Adept Electronic Solutions · Level 1, 15 Drake St, 06017 Osborne Park, WA, Australia,
Tel.: +61 892425350, adept@adept.net.au, www.adept.net.au
AUS-1

Distributor

Baumer has established itself as the leading company for vision technologies. Its wide range of digital cameras, vision sensors and further image processing products with cutting-edge technologies provides high quality for industrial, scientific and medical applications. Next to vision products Baumer is known as the premier innovator for precision sensors, motion control, identification solutions, gluing systems and process instrumentation for the automation market.

Baumer

Baumer (China) Co., Ltd.
Building 30, 2nd Floor, Section A, Minyi Road 201,
Songjiang District
201612 Shanghai
China
Tel.: +86 2167687095
Fax: +86 2167687098
sales.cn@baumer.com
www.baumer.com
CN-1

Distributor, Solution Provider

G4 Technology offers superior vision components as a distributor and acts as a solution-provider with years of practical experiences and expertise. With comprehensive product lines and remarkable integration capability, we've won deep trust from customers to fit their needs. The market share of G4 is expanding rapidly and we're dedicated to assisting customers to raise competitiveness and maintaining win- win partnership with our principals.

G4 Technology Co., Ltd. · 5F, No. 46, Sec. 3, Minquan E. Rd, Taipei 104-77, Taiwan,
Tel.: +886 2 2503 1803, Fax: +886 2 2503 1802, ken@g4.com.tw, www.g4.com.tw
RC-1

Producer, Solution Provider

Gidel was founded in 1993 as a high-end system development and integration company. With our project-level approach, we created several powerful and advanced tools for high-performance system development. In 1997 we began providing our in-house development systems to the industry. GiDEL provides machine vision components utilizing FPGA technology for Frame Grabbers, Image Processing, Hardware Accelerations for Algorithms and Camera/Machine Simulators.

Gidel Ltd. · 2 Ha'ilan St. P.O.Box 281, 30600 Or Akiva, Israel,
Tel.: +972 4 610 2500, Fax: +972 4 610 2501, sales_eu@gidel.com, www.gidel.com
IL-1

Producer

Goyo Optical Inc., founded in 1976, develops, produces and sells industrial optics. The company dared to step into the new business field with entrepreneur spirit. At first, we have concentrated our development work on two fields: CCTV lenses and industrial FA lenses. As a result we succeeded in delivering scanner lenses, TV macro lenses, micro camera lenses to industrial customers as key components and responding to the customer´s needs and to the market growth, always with the highest technology.

Goyo Optical Inc · 3-8-31 Hamazaki, 351-0033 Asaka-Saitama, Japan,
Tel.: +81 48 474 2235, info@goyooptical.com, www.goyooptical.com
J-1

Association

Japan Industrial Imaging Association (JIIA) is a Japan-based organization fostering technological innovation of industrial imaging, promoting global community for the organizations related to industrial imaging, and thereby further contributing to development of the field of these industrial imaging world-wide.

Japan Industrial Imaging Association · 2-10-15, Nakameguro, Yamate Ave. K Bldg., 153-0061 Meguro, Tokyo, Japan, Tel.: +81 3 3716 3933, Fax: +81 3 3716 3933, info@jiia.org, www.jiia.org J-2

Producer

NED is Japans No. 1 maker of high speed Line Scan cameras. We have up to 8K 320 MHz models in color and black and white. Using state of the art high speed CMOS line scan technology and all the key functions such as exposure control and shading correction. English and Chinese language support available and custom models are available on request.

NED (Nippon Electro-Sensory Devices Ltd) · Shinagawa-ku, Ohi 1-45-2 Gibraltar Ohi Bldg, 4f, 140-0014 Tokyo, Japan, Tel.: +81 80 4010 2684, d.phillip@ned-sensor.com, www.ned-sensor.co.jp/ J-3

Producer

Apart from offering off-the-shelf cameras, Kamiera also offers OpenCam reference designs for GigE cameras. This revolutionary do-it-yourself model allows customization of the full camera design, starting from the FPGA code, through the electronic design and up to the opto-mechanical design. The OpenCam model also cuts cost by up to 50 %.

Kamiera · 6A Massada St., 45294 Hod Hasharon, Israel, Tel.: +972 9 7603425, Fax: +972 9 7421622, info@kamiera.com, www.kamiera.com IL-2

Producer

Toshiba Teli is contributing to society and helping business move forward through its wide range of imaging system solutions centered on camera technologies. The companie's three divisions – Machine Vision & Medical Imaging, Security & Surveillance Camera Systems, and Medical & Plasma RF compornents – are working in concert to accelerate our pioneering efforts and strengthen our business with North America, Europe and Asia.

Toshiba Teli Corporation · 4-7-1 Asahigaoka, 1910065 Hino, Tokyo, Japan, Tel.: +81 425 89 8771, Fax: +81 425 89 8774, h-kiyama@toshiba-teli.co.jp, www.toshiba-teli.co.jp J-4

Cameras & Image S

ABS
www.abs-jena.de

Adimec
www.adimec.com

Aicon 3D Systems
www.aicon.de

AIM Infrarot Module
www.aim-ir.de

AKE-Components
www.ake-components.de

Allied Vision Technologies
www.alliedvisiontec.com

Allison Park Group
www.apgvision.com

Alrad Imaging
www.alrad.co.uk

AMS Technologies
www.ams.de

Anafocus
www.anafocus.com

Andor Technology
www.andor.com

AOS Technologies
www.aostechnologies.com

Applied Scintillation Technologies
www.appscintech.com

Artray
www.artray.co.jp

Asentics
www.asentics.de

Automation Technology
www.automationtechnology.de

Awaiba
www.awaiba.com

BAP Image Systems
www.bapis.de

Basler Vision Technologies
www.baslerweb.com

Baumer
www.baumer.com

Beijing Microview
www.microview.com.cn

BFI Optilas
www.bfioptilas.com

Bock Optronics
www.bockoptronics.ca

Canesta
www.canesta.com

C-Cam Technologies
www.c-cam.be

China Daheng Group
www.daheng-image.com

Chromasens
www.chromasens.de

Cmos Vision
www.cmosvision.com

CMOSIS
www.cmosis.com

Cognex
www.cognex.com

Cohu
www.cohu-cameras.com

Compar
www.compar.ch

Computer BV
www.computerbv.de

Cosyco
www.cosyco.de

CSEM
www.csem.ch

Cypress Semiconductor
www.cypress.com

Dalsa
www.dalsa.com

Data Vision
www.datvision.com

Datalogic Automation
www.automation.datalogic.com

Dedo Weigert
www.dedoweigertfilm.de

Devitech
www.devitech.dk

Digital West Imaging
www.DigitalWestimaging.com

e2v
www.e2v.com

Eastman Kodak
www.kodak.com/go/imagers

ebs Automatisierte Thermographie und Systemtechnik
www.irpod.net

Edmund Optics
www.edmundoptics.de

EHD Imaging
www.ehd.de

Eltec Elektronik
www.eltec.com

Eltrotec Sensor
www.eltrotec.com

Entner Electronics
www.entner-electronics.com

Epix
www.epixinc.com

Erhard + Leimer
www.erhardt-leimer.com

Eureca Messtechnik
www.eureca.de

Euresys
www.euresys.com

Fabrimex Systems
www.fabrimex-systems.ch

Fairchild Imaging
www.fairchildimaging.com

Fastec Imaging
www.fastecimaging.com

FiberVision
www.fibervision.de

FJW Optical Systems
www.findrscope.com

Flir Systems
www.flirthermography.de

Fluke
www.fluke.de

Framos
www.framos.eu

FSI Technologies
www.fsinet.com

Fuzhou Feihua Optoelectronic Technology
www.fzfh.com

G4 Technology
www.g4.com.tw

Gevicam
www.gevicam.com

Goodrich/SUI
www.sensorsinc.com

Goratec
www.goratec.de

gsvitec
www.gsvitec.com

Hamamatsu Photonics
www.hamamatsu.com

Helion
www.helionvision.com

HGV Vosseler
www.hgv.de

High Speed Vision
www.hsvision.de

Hitachi Kokusai Electric
www.hitachi-keu.com

Horn Imaging
www.horn-imaging.de

Ico Data
www.icodata.de

IDS
www.ids-imaging.com

ensors

Ikegami www.ikegami.de	**Kamiera** www.kamiera.com
Illunis www.illunis.com	**Kappa opto-electronics** www.kappa.de
Image House www.imagehouse.dk	**Karlheinz Hinze Optoengineering** www.hinze-opto.de
Image S www.imagessrl.com	**KeeKoon Electronics** www.keekoon.com
Imaging Solutions Group www.isgchips.com	**Klughammer** www.klughammer.de
Imi Technology www.imi-tech.com	**Kvant** www.kvant.sk
Impac Infrared www.impacinfrared.com	**Lambda Photometrics** www.lambdaphoto.co.uk
Imperx www.imperx.com	**Leitner Industrial Endoscopy** www.leitner-efer.de
IMS Chips www.ims-chips.de	**Leutron Vision** www.leutron.com
Industrial Vision Systems www.industrialvision.co.uk	**Leuze Electronic** www.leuze.com
Infaimon www.infaimon.com	**LMI Technologies** www.lmitechnologies.com
InfraTec www.infratec.de	**Lord Ingenierie** www.lord-ing.com
Insensiv www.insensiv.de	**LOT Oriel** www.lot-oriel.com
IOS www.ios-web.de	**Lumenera** www.lumenera.com
Ircam www.ircam.de	**Luster LightVision Tech** www.lusterinc.com
IS Imaging Solutions www.imaging-solutions.de	**MAK Bildtechnik** www.mak-bildtechnik.de
JAI www.jai.com	**Matrix Vision** www.matrix-vision.de
Japan F.A. Systems Corporation www.jfas.co.jp	**MaxxVision** www.maxxvision.com
JenCam www.jencam.de	**Menzel Vision and Robotics** www.menzelab.com
Jenoptik Laser, Optik, Systeme www.jenoptik-los.de	**Mesa Imaging** www.mesa-imaging.ch
Kamera Werke Dresden www.kwdo.de	**Microsystems** www.microsystems.it

Mikromak Service
www.mikromak.com

Mikrotron
www.mikrotron.de

msiVision
www.msivision.com

NAC
www.nacinc.de

Narragansett Imaging
www.nimaging.com

National Instruments
www.ni.com

NED
www.ned-sensor.co.jp

NET
www.net-gmbh.com

NeuPro Solutions
www.neupro-solutions.com

NTI
www.nti-measure.com

OBE Ohnmacht & Baumgärtner
www.trevista.net

Odem Technologies
www.odem.co.il

Olympus
www.olympus-europa.com

Omron
www.industrial.omron.de

Opto Fidelity
www.optofidelity.com

Opto Sonderbedarf
www.opto.de

Optrima
www.optrima.com

Optris
www.optris.de

Optronis
www.optronis.com

Orbis
www.orbis.eu

Panasonic Electric Works
www.panasonic-electric-works.de

Parameter
www.parameter.se

PCO
www.pco.de

Pentacon
www.pentacon.de

PerkinElmer Optoelectronics
www.perkinelmer.com

Philips
www.apptech.philips.com/vision

Photonfocus
www.photonfocus.com

Photron
www.photron.com

Phytec Messtechnik
www.phytec.de

pi4_robotics
www.pi4.de

Pieper
www.pieper-video.de

PixeLink
www.pixelink.com

PMDTec
www.pmdtec.com

Point Grey Research
www.ptgrey.com

Polytec
www.polytec.com

Princeton Instruments
www.princetoninstruments.com

Prosilica
www.prosilica.com

Proxitronic
www.proxitronic.com

Qualimatest
www.qmt.ch

Quest Innovations
www.quest-innovations.com

Rad-icon Imaging
www.rad-icon.com

Rauscher
www.rauscher.de

Redlake
www.redlake.com

RH Engineering
www.rhengineering.de

Roper Scientific
www.roperscientific.de

Rubroeder
www.rubroeder.de

Salvador Imaging
www.salvadorimaging.com

Schael-Optik
www.schael-optik-ltd.com

Schäfter + Kirchhoff
www.sukhamburg.de

Schmachtl
www.schmachtl.at

SDT - Dr. Seitner
www.sdt-seitner.com

Second2None
www.visiondragon.com

Secube
www.secube.co.kr

Sedeco Vision Components
www.sedeco.nl

Seiwa Optical
www.seiwaopt.co.jp

Sensor to Image
www.sensor-to-image.de

Sentech
www.sentech.co.jp

Sharp Microelectronics
www.sharpsme.com

SKS Vision Systems
www.visionsystems.fi

Slomotec
www.slomotec.de

Smartray
www.smartray.de

Softhard Technology
www.softhard.com

Soliton Technologies
www.solitontech.com

Sony
www.sonybiz.net/vision

Stemmer Imaging
www.stemmer-imaging.com

STZ Qualitätssicherung und Bildverarbeitung
www.stz-ilmenau.de

Sugitoh
www.sugitoh.jp

SVS Vistek
www.svs-vistek.com

SVSI
www.southernvisionsystems.com

Symco
www.symco.co.jp

Tattile
www.tattile.com

Tekno Optik
www.teknooptik.se

Tekstar Optical
www.tekstaroptical.com

The Imaging Source
www.theimagingnsource.com

Thermosensorik
www.thermosensorik.de

Tichawa Vision
www.tichawa.de

Toshiba
www.toshiba.ch

Toshiba Teli
www.toshiba-teli.co.jp

TVI Vision
www.tvivision.com

Unibrain
www.unibrain.com

VDS Vosskühler
www.vdsvossk.de

Vega Technology Group
www.vegatcgroup.com

Vialux
www.vialux.de

Vicon Motion Systems
www.vicon.com

Videology Imaging Solutions
www.videologyinc.com

Videor Technical
www.videor.com

ViDiSys
www.vidisys.de

visicontrol
www.visicontrol.com

Visiolaser
www.vannier-photelec.fr/visiolaser

Vision & Control
www.vision-control.com

Vision Components
www.vision-components.com

Vision Research
www.visionresearch.com

Vision Tools
www.vision-tools.com

Visionlink
www.visionlink.it

Vistas
www.vistas-gmbh.de

Vistek
www.vistekas.com

Vitronic
www.vitronic.com

ViZaar
www.vizaar.de

VKT
www.vkt.de

VRmagic
www.vrmagic.com

Weiss Imaging and Solutions
www.weiss-imaging.de

Werner Nophut
www.dsam.de

Xenics
www.xenics.com

Zertrox
www.zertrox.de

Consulting, Marketing, Education & Other Services

A.I.D.A. IMVG
www.associazionevisione-imvg.it

AIA Automated Imaging Association
www.machinevisiononline.org

AIDO
www.aido.es

Alfavision
www.alfavision.de

Arvoo Imaging Products
www.arvoo.com

AS Thermographie
www.as-thermografie.de

Asentics
www.asentics.de

Austrian Research Centers
www.smart-systems.at

Awaiba
www.awaiba.com

Carl Zeiss 3D Metrology Services
www.zeiss3d.de

CMES – Chinese Mechanical Engineering Society
www.cmes.org

Cmos Vision
www.cmosvision.com

CMOSIS
www.cmosis.com

Cognex
www.cognex.com

Collischon Optik-Design
www.mikro-optik.de

CSEM
www.csem.ch

CTMV
www.ctmv.de

Datapixel
www.datapixel.com

de Man Industrie-Automation
www.deman.de

Delta Digital Video
www.delta.dk

Digital West Imaging
www.DigitalWestimaging.com

Duwe 3D
www.duwe-3d.de

EMVA European Machine Vision Association
www.emva.org

Entner Electronics
www.entner-electronics.com

Erhard + Leimer
www.erhardt-leimer.com

Farbmessung Schröder
www.farbmessung.com

FiberVision
www.fibervision.de

Framos
www.framos.eu

Fraunhofer Allianz Vision
www.vision.fraunhofer.de

Fritz Pauker Ingenieure
www.pauker-ingenieure.de

G4 Technology
www.g4.com.tw

GBS
www.gbs-ilmenau.de

GFaI
www.gfai.de

GIT Verlag
www.gitverlag.com

Graphikon
www.graphikon.de

HGV Vosseler
www.hgv.de

IAI Imaging Association of India
www.iaionline.org

IDS
www.ids-imaging.com

Imaging Lab
www.imaginglab.it

Impuls
www.impuls-imaging.com

INB Vision
www.inb-vision.com

Infaimon
www.infaimon.com

InRay Solutions
www.inrays.com

IS Imaging Solutions
www.imaging-solutions.de

IVAN
www.feda.nl

Jansen C.E.O.
www.jansen-ceo.com

JIIA Japan Industrial Imaging Association
www.jiia.org

Joanneum Research
www.joanneum.at

Kappa opto-electronics
www.kappa.de

Landesmesse Stuttgart
www.vision-fair.de

Lincoln Laser Company
www.lincolnlaser.com

Messe München
www.messe-muenchen.de

msiVision
www.msivision.com

Neurocheck
www.neurocheck.com

NTI
www.nti-measure.com

OBE Ohnmacht & Baumgärtner
www.trevista.net

Omron
www.industrial.omron.de

Optical Research Associates
www.opticalres.com

Opto Fidelity
www.optofidelity.com

Opto Sonderbedarf
www.opto.de

P.E. Schall
www.schall-messen.de

Phytec Messtechnik
www.phytec.de

pi4_robotics
www.pi4.de

Polytec
www.polytec.com

Rubroeder
www.rubroeder.de

Sensor to Image
www.sensor-to-image.de

SmartSurv
www.smartsurv.de

Solving3D
www.solving3d.de

SPG Data 3D
www.spgdata3d.com

Stemmer Imaging
www.stemmer-imaging.com

STZ Qualitätssicherung und Bildverarbeitung
www.stz-ilmenau.de

Supercomputing Systems
www.scs-vision.ch

SVS Vistek
www.svs-vistek.com

Symop
www.symop.com

UKIVA
www.ukiva.org

University of Applied Scienes
www.fbmn.h-da.de

Univision
www.univision.it

Van de Loosdrecht Machine Vision
www.vdlmv.nl

VDMA Industrielle Bildverarbeitung
www.vdma.org/vision

Vega Technology Group
www.vegatcgroup.com

Vision & Control
www.vision-control.com

Vision Academy
www.vision-academy.org

Vision Club of Finland
www.automaatioseura.fi

Vision Machines
www.vision-machines.com

Vision N
www.vision-n.de

Vision Tools
www.vision-tools.com

Visionlink
www.visionlink.it

Vistek
www.vistekas.com

Vitronic
www.vitronic.com

VMT
www.vmt-gmbh.com

wenglor sensoric
www.wenglor.com

Zertrox
www.zertrox.de

Illum & Lighting Sys

ABW
www.abw-3d.de

Advanced Illumiation
www.advancedillumination.com

Allison Park Group
www.apgvision.com

Alrad Imaging
www.alrad.co.uk

Balluf
www.balluf.de

Baumer
www.baumer.com

BFI Optilas
www.bfioptilas.com

Bock Optronics
www.bockoptronics.ca

Büchner Lichtsysteme
www.buechner-lichtsysteme.de

Cavitar
www.cavitar.com

CCS Europe
www.ccs-grp.com

Ceres Vision
www.ceresvision.de

Chromasens
www.chromasens.de

Cognex
www.cognex.com

Coherent
www.coherent.com

Collischon Optik-Design
www.mikro-optik.de

Computer BV
www.computerbv.de

Data Vision
www.datvision.com

DCM Sistemes
www.dcmsistemes.com

Dedo Weigert
www.dedoweigertfilm.de

Digital West Imaging
www.DigitalWestimaging.com

Edmund Optics
www.edmundoptics.de

Erhard + Leimer
www.erhardt-leimer.com

Fabrimex Systems
www.fabrimex-systems.ch

Falcon LED Lighting
www.falcon-lighting.de

Faseroptik Henning
www.faseroptik-henning.de

Fiberoptics Technology
www.fiberoptix.com

FiberVision
www.fibervision.de

Finger
www.finger-kg.de

Framos
www.framos.eu

Frankfurt Laser Company
www.frlaser.com

FSI Technologies
www.fsinet.com

G4 Technology
www.g4.com.tw

Gardasoft Vision
www.gardasoft.com

Global Laser
www.global-lasertech.co.jp

GPP Chemnitz
www.gppc.de

Hamamatsu Photonics
www.hamamatsu.com

Hema
www.hema.de

Herbert Waldmann
www.waldmann.com

HGV Vosseler
www.hgv.de

IB/E Optics
www.ibe-optics.com

iiM
www.iimag.de

ILEE
www.ilee.ch

Image House
www.imagehouse.dk

Image S
www.imagessrl.com

Infaimon
www.infaimon.com

Insensiv
www.insensiv.de

IS Imaging Solutions
www.imaging-solutions.de

Japan F.A. Systems Corporation
www.jfas.co.jp

Jenoptik Laser, Optik, Systeme
www.jenoptik-los.de

Jos. Schneider Optische Werke
www.schneiderindustrialoptics.com

Karlheinz Hinze Optoengineering
www.hinze-opto.de

Keyence
www.keyence.de

Klughammer
www.klughammer.de

Kvant
www.kvant.sk

Lambda Photometrics
www.lambdaphoto.co.uk

Laser 2000
www.laser2000.de

Laser Components
www.lasercomponents.com

Leitner Industrial Endoscopy
www.leitner-efer.de

LEJ Leistungselektronik Jena
www.lej.de

Leutron Vision
www.leutron.com

LMI Technologies
www.lmitechnologies.com

LOT Oriel
www.lot-oriel.com

Luster LightVision Tech
www.lusterinc.com

Matrix Vision
www.matrix-vision.de

MaxxVision
www.maxxvision.com

Menzel Vision and Robotics
www.menzelab.com

Metaphase Technologies
www.metaphase-tech.com

Microscan
www.microscan.com

Microsystems
www.microsystems.it

MikroVision
www.mikrovision.de

Moritex
www.moritex.com

msiVision
www.msivision.com

MTD
www.mtd-light.com

Myutron
www.myutron.com

NET
www.net-gmbh.com

NeuPro Solutions
www.neupro-solutions.com

OBE Ohnmacht & Baumgärtner
www.trevista.net

Odem Technologies
www.odem.co.il

ination tems

Olympus
www.olympus-europa.com

Omicron Laserage
www.omicron-laser.de

Omron
www.industrial.omron.de

Opto Engineering
www.opto-engineering.com

Opto Precision
www.optoprecision.de

Opto Sonderbedarf
www.opto.de

Optometron
www.optometron.de

OptoPolymer
www.optopolymer.de

Orbis
www.orbis.eu

Parameter
www.parameter.se

PerkinElmer Optoelectronics
www.perkinelmer.com

Phaer
www.phaer.be

Phlox
www.phlox-gc.com

Phytec Messtechnik
www.phytec.de

pi4_robotics
www.pi4.de

Planistar Lichttechnik
www.planistar.de

POG Präzisionsoptik Gera
www.pog.eu

Polytec
www.polytec.com

Profactor
www.profactor.at

Qualimatest
www.qmt.ch

Rauscher
www.rauscher.de

RH Engineering
www.rhengineering.de

Schael-Optik
www.schael-optik-ltd.com

Schäfter + Kirchhoff
www.sukhamburg.de

Schmachtl
www.schmachtl.at

Schott
www.schott.com/fiberoptics

Second2None
www.visiondragon.com

Sedeco Vision Components
www.sedeco.nl

Seiwa Optical
www.seiwaopt.co.jp

Sharp Microelectronics
www.sharpsme.com

Sill Optics
www.silloptics.de

Smart Vision Lights
www.smartvisionlights.com

Soliton Technologies
www.solitontech.com

Special Application Products
www.sapltd.co.uk

Spectrum Illumination
www.spectrumillumination.com

Stemmer Imaging
www.stemmer-imaging.com

StockerYale
www.stockeryale.com

STZ Qualitätssicherung und Bildverarbeitung
www.stz-ilmenau.de

SVS Vistek
www.svs-vistek.com

Symco
www.symco.co.jp

tecin
www.tecin.de

Tekno Optik
www.teknooptik.se

Tema
www.temavisio.com

The Imaging Source
www.theimagingnsource.com

Univision
www.univision.it

V Cubed
www.vcubed.co.uk

Vialux
www.vialux.de

visicontrol
www.visicontrol.com

Visiolaser
www.vannier-photelec.fr/visiolaser

Vision & Control
www.vision-control.com

Vision Light Tech
www.visionlighttech.com

Vision Tools
www.vision-tools.com

Visionlink
www.visionlink.it

Visitool
www.visitool.de

Vistas
www.vistas-gmbh.de

Vistek
www.vistekas.com

Weiss Imaging and Solutions
www.weiss-imaging.de

wenglor sensoric
www.wenglor.com

Zertrox
www.zertrox.de

Frame Grabber

Active Silicon
www.activesilicon.com

Adlink
www.adlinktech.eu

Alacron
www.alacron.com

Alrad Imaging
www.alrad.co.uk

Arvoo Imaging Products
www.arvoo.com

Baumer
www.baumer.com

Beijing Microview
www.microview.com.cn

BitFlow
www.bitflow.com

Bock Optronics
www.bockoptronics.ca

China Daheng Group
www.daheng-image.com

Cognex
www.cognex.com

Computer BV
www.computerbv.de

Cosyco
www.cosyco.de

Cyberoptics Semiconductor
www.imagenation.com

Dalsa
www.dalsa.com

Data Vision
www.datvision.com

Ellips
www.ellips.nl

Eltec Elektronik
www.eltec.com

Epix
www.epixinc.com

Fabrimex Systems
www.fabrimex-systems.ch

Fast
www.fast-corp.co.jp

Framos
www.framos.eu

G4 Technology
www.g4.com.tw

Gidel
www.gidel.com

HaSoTec
www.hasotec.com

HGV Vosseler
www.hgv.de

IDS
www.ids-imaging.com

Image House
www.imagehouse.dk

Image S
www.imagessrl.com

Imaging Solutions Group
www.isgchips.com

Imperx
www.imperx.com

Infaimon
www.infaimon.com

IS Imaging Solutions
www.imaging-solutions.de

Isra Vision
www.isravision.com

Japan F.A. Systems Corporation
www.jfas.co.jp

Karlheinz Hinze Optoengineering
www.hinze-opto.de

Kvant
www.kvant.sk

Lambda Photometrics
www.lambdaphoto.co.uk

Leutron Vision
www.leutron.com

Luster LightVision Tech
www.lusterinc.com

Matrix Vision
www.matrix-vision.de

Matrox Imaging
www.matrox.com/imaging

MaxxVision
www.maxxvision.com

Menzel Vision and Robotics
www.menzelab.com

Microsystems
www.microsystems.it

Mikrotron
www.mikrotron.de

msiVision
www.msivision.com

National Instruments
www.ni.com

Odem Technologies
www.odem.co.il

Orbis
www.orbis.eu

Parameter
www.parameter.se

Phytec Messtechnik
www.phytec.de

pi4_robotics
www.pi4.de

Polytec
www.polytec.com

Qualimatest
www.qmt.ch

Rauscher
www.rauscher.de

Schael-Optik
www.schael-optik-ltd.com

Schmachtl
www.schmachtl.at

Second2None
www.visiondragon.com

Seldes
www.seldes.com

Sensor to Image
www.sensor-to-image.de

Silicon Software
www.silicon-software.de

Stemmer Imaging
www.stemmer-imaging.com

STZ Qualitätssicherung und Bildverarbeitung
www.stz-ilmenau.de

Sundance Multiprocessor Technology
www.sundance.com

SVS Vistek
www.svs-vistek.com

Symco
www.symco.co.jp

The Imaging Source
www.theimagingnsource.com

Videology Imaging Solutions
www.videologyinc.com

ViDiSys
www.vidisys.de

Vision Tools
www.vision-tools.com

Visionlink
www.visionlink.it

Vistek
www.vistekas.com

Weiss Imaging and Solutions
www.weiss-imaging.de

Microscopes, Endoscopes & Equipment

Alrad Imaging
www.alrad.co.uk

AMS Technologies
www.ams.de

Andor Technology
www.andor.com

Asylum Research
www.AsylumResearch.com

Atomic Force
www.atomicforce.de

Awaiba
www.awaiba.com

Bock Optronics
www.bockoptronics.ca

Breitmeier Messtechnik
www.breitmeier.de

Carl Zeiss Microimaging
www.zeiss.de/mikro

Deben UK
www.deben.co.uk

Dr. Heinrich Schneider Messtechnik
www.dr-schneider.de

Edmund Optics
www.edmundoptics.de

EHD Imaging
www.ehd.de

Eltrotec Sensor
www.eltrotec.com

Fei Company
www.fei.com

FRT Fries Research & Technology
www.frt-gmbh.com

G4 Technology
www.g4.com.tw

GE Inspection Technology
www.geinspectiontechnologies.com

Helmut Hund
www.hund.de

Hipp Endoskop Service
www.hipp-endoskopservice.com

Horn Imaging
www.horn-imaging.de

Infaimon
www.infaimon.com

Infinity Photo-Optical
www.infinity-de.com

Karl Storz
www.karlstorz.de

Karlheinz Hinze Optoengineering
www.hinze-opto.de

Kdorf Automation
www.kdorf.de

Keyence
www.keyence.de

Klughammer
www.klughammer.de

Kvant
www.kvant.sk

Leica Microsystems
www.leica-microsystems.com

Leitner Industrial Endoscopy
www.leitner-efer.de

LOT Oriel
www.lot-oriel.com

MBR
www.mbr-gmbh.com

Micos
www.micos.ws

Mikroskoptechnik Rathenow
www.askania.de

MikroVision
www.mikrovision.de

Mitutoyo
www.mitutoyo.de

Moritex
www.moritex.com

msiVision
www.msivision.com

NanoFocus
www.nanofocus.de

Nanosurf
www.nanosurf.com

Nikon
www.nikoninstruments.eu

Olympus
www.olympus-europa.com

Opto Sonderbedarf
www.opto.de

OptoMess
www.optomess.de

Optometron
www.optometron.de

Optoprim
www.optoprim.de

Oxford Instruments
www.oxford-instruments.com

Panasonic
www.pss.panasonic.eu/microcameras

PCE Power Control
www.pce-powercontrol.de

Physik Instrumente
www.pi.ws

pi4_robotics
www.pi4.de

Richard Wolf
www.richard-wolf.com

Rubroeder
www.rubroeder.de

Schael-Optik
www.schael-optik-ltd.com

Schäfer Technologie
www.schaefer-tec.com

Seiwa Optical
www.seiwaopt.co.jp

Seldes
www.seldes.com

STZ Qualitätssicherung und Bildverarbeitung
www.stz-ilmenau.de

tecin
www.tecin.de

Tekno Optik
www.teknooptik.se

Thermosensorik
www.thermosensorik.de

Vega Technology Group
www.vegatcgroup.com

Vision Engineering
www.visioneng.de

Visitool
www.visitool.de

Volpi
www.volpi.ch

Walter Uhl
www.walteruhl.de

Weiss Imaging and Solutions
www.weiss-imaging.de

Werth Messtechnik
www.werthmesstechnik.de

Wild
www.wild.at

Optic Metrol

3D Alliance
www.3dalliance.de

3D Shape
www.3d-shape.com

Alicona Imaging
www.alicona.com

AMS Technologies
www.ams.de

Andor Technology
www.andor.com

Applied Scintillation Technologies
www.appscintech.com

Armstrong Optical
www.armstrongoptical.co.uk

Avantes
www.avantes.com

Benteler Maschinenbau
www.benteler.de/maschinenbau

Bentham Instruments
www.bentham.co.uk

Berliner Glas
www.berlinerglas.de

Breitmeier Messtechnik
www.breitmeier.de

Breuckmann
www.breuckmann.com

BST International
www.bst-international.com

Carl Zeiss IMT
www.zeiss.de

Carl Zeiss Microimaging
www.zeiss.de/mikro

Chunghwa Telecommunication Laboratories
www.leadinglight.com.tw

CMC Kuhnke
www.cmc-kuhnke.de

ColorLite
www.colorlite.de

Dantec Dynamics
www.dantecdynamics.com

Datapixel
www.datapixel.com

Delta Digital Video
www.delta.dk

Digital Surf
www.digitalsurf.com

Dr. Heinrich Schneider Messtechnik
www.dr-schneider.de

Dr. Wehrhahn Messsysteme
www.drwehrhahn.com

Dyoptyka
www.dyoptyka.com

EHD Imaging
www.ehd.de

Electronic Systems
www.electronicsystems.it

ElektroPhysik
www.elektrophysik.com

Eltromat
www.eltromat.de

Eltrotec Sensor
www.eltrotec.com

EVK DI Kerschaggl
www.evk.biz

Farbmessung Schröder
www.farbmessung.com

Faro
www.faro.com

FJW Optical Systems
www.findrscope.com

Flir Systems
www.flirthermography.de

Fritz Pauker Ingenieure
www.pauker-ingenieure.de

FRT Fries Research & Technology
www.frt-gmbh.com

G4 Technology
www.g4.com.tw

GE Inspection Technology
www.geinspectiontechnologies.com

GF Messtechnik
www.gfmesstechnik.de

GOM
www.gom.com

Goodrich/SUI
www.sensorsinc.com

Goratec
www.goratec.de

Hamamatsu Photonics
www.hamamatsu.com

Heitronics Infrarot Messtechnik
www.heitronics.com

Hexagon Metrology
www.hexagonmetrology.net

HGV Vosseler
www.hgv.de

Hipp Endoskop Service
www.hipp-endoskopservice.com

Hommel Etamic
www.hommel-etamic.de

IB/E Optics
www.ibe-optics.com

Ico Data
www.icodata.de

iiM
www.iimag.de

ILEE
www.ilee.ch

Imetric
www.imetric.com

Infaimon
www.infaimon.com

Infinity Photo-Optical
www.infinity-de.com

InfraTec
www.infratec.de

Innowep
www.innowep.com

InSystems Automation
www.insystems.de

Intacton
www.intacton.de

Isis Optronics
www.isis-optronics.de

Isi-sys
www.isi-sys.com

Jenoptik Laser, Optik, Systeme
www.jenoptik-los.de

Jos. Schneider Optische Werke
www.schneiderindustrialoptics.com

Kleiber Infrared
www.kleiberinfrared.com

Konica Minolta
www.konicaminolta.eu

Kreon Technologies
www.kreon3d.com

Lambda Photometrics
www.lambdaphoto.co.uk

LamTech
www.lamtech.de

Land Instruments
www.landinst.com

LAP
www.lap-laser.com

Laser 2000
www.laser2000.de

Laser Components
www.lasercomponents.com

Laser Quantum
www.laserquantum.com

LDV Systeme
www.ldv-systeme.de

Leica Geosystems
www.leica-geosystems.com/metrology

Leitner Industrial Endoscopy
www.leitner-efer.de

al ogy

Limess
www.limess.com

LOT Oriel
www.lot-oriel.com

Mahr
www.mahr.de

Meta Vision Systems
www.meta-mvs.co.uk

Metris
www.metris.com

MG Optical Solutions
www.mgopticalsolutions.com

Mikropack
www.mikropack.de

Mitutoyo
www.mitutoyo.de

Moeller-Wedel Optical
www.moeller-wedel-optical.com

Molenaar Optics
www.molenaar-optics.com

Moritex
www.moritex.com

m-u-t
www.mut-group.com

Mycrona
www.mycrona.de

NanoFocus
www.nanofocus.de

Nikon
www.nikoninstruments.eu

NTI
www.nti-measure.com

nub3d
www.nub3d.com

Odem Technologies
www.odem.co.il

OGP Messtechnik
www.ogpmesstechnik.de

Olympus
www.olympus-europa.com

Opsira
www.opsira.de

Optimet Optical Metrology
www.optimet.com

Opto Fidelity
www.optofidelity.com

Opto Precision
www.optoprecision.de

Opto Sonderbedarf
www.opto.de

OptoMess
www.optomess.de

Optometron
www.optometron.de

OptoPolymer
www.optopolymer.de

Optoprim
www.optoprim.de

OptoSurf
www.optosurf.com

Optris
www.optris.de

Orbis
www.orbis.eu

Oxford Instruments
www.oxford-instruments.com

Parameter
www.parameter.se

Pentacon
www.pentacon.de

Perceptron
www.perceptron.com

PerkinElmer Optoelectronics
www.perkinelmer.com

Phaer
www.phaer.be

phoenix|x-ray
www.phoenixxray.com

Phynix
www.phynix.de

pi4_robotics
www.pi4.de

Plasmo Industrietechnik
www.plasmo.eu

Polygon
www.polygon-technology.de

Precitec Optronik
www.precitec-optronik.de

Premosys
www.premosys.com

Princeton Instruments
www.princetoninstruments.com

Proxitronic
www.proxitronic.com

Quest Innovations
www.quest-innovations.com

Raytek
www.raytek.de

Richard Wolf
www.richard-wolf.com

Roper Scientific
www.roperscientific.de

Rudolph Technologies
www.rudolphtech.com

Schäfer Technologie
www.schaefer-tec.com

Sensor Instruments
www.sensorinstruments.de

SGM Schut
www.schut.com

Sick
www.sick.com

SIOS Meßtechnik
www.sios.de

SKS Vision Systems
www.visionsystems.fi

Soliton
www.soliton-gmbh.de

Specim Spectral Imaging
www.specim.fi

Steinbichler Optotechnik
www.steinbichler.com

Stiefelmayer
www.stiefelmayer.de

Taylor Hobson
www.taylor-hobson.com

tec5
www.tec5.com

TechnoTeam
www.technoteam.de

Tekno Optik
www.teknooptik.se

Topometric
www.topometric.net

Tordivel
www.scorpionvision.com

Ulis
www.ulis-ir.com

Vialux
www.vialux.de

Videometer
www.videometer.com

Visiolaser
www.vannier-photelec.fr/visiolaser

Vision Machines
www.vision-machines.com

ViZaar
www.vizaar.de

Volform
www.volform.se

Wente/Thiedig
www.wente-thiedig.de

Werth Messtechnik
www.werthmesstechnik.de

Wild
www.wild.at

Xenics
www.xenics.com

X-Rite
www.xrite.com

Yxlon International
www.yxlon.com

Z-Laser
www.z-laser.com

Zwick
www.zwick.de

ZygoLOT
www.zygolot.de

Optics

Allied Vision Technologies www.alliedvisiontec.com			**Eureca Messtechnik** www.eureca.de
Alrad Imaging www.alrad.co.uk			**Fabrimex Systems** www.fabrimex-systems.ch
AMS Technologies www.ams.de			**FiberVision** www.fibervision.de
Anteryon www.anteryon.com			**Finger** www.finger-kg.de
Armstrong Optical www.armstrongoptical.co.uk			**Fisba Optik** www.fisba.ch
Awaiba www.awaiba.com	**Bock Optronics** www.bockoptronics.ca	**Cosyco** www.cosyco.de	**Framos** www.framos.eu
Azure Photonics www.azurephotonics.com	**Carl Zeiss** www.zeiss.com/lenses4industry	**Data Vision** www.datvision.com	**FRT Fries Research & Technology** www.frt-gmbh.com
B & M Optik www.bm-optik.de	**Carl Zeiss IMT** www.zeiss.de	**Devitech** www.devitech.dk	**Fujinon** www.fujinon.de
Baumer www.baumer.com	**Carl Zeiss Microimaging** www.zeiss.de/mikro	**Docter Optics** www.docter-optics.com	**G4 Technology** www.g4.com.tw
Berliner Glas www.berlinerglas.de	**CBC Deutschland** www.cbc-de.com	**Edmund Optics** www.edmundoptics.de	**Goyo Optical** www.goyooptical.com
BFI Optilas www.bfioptilas.com	**Collischon Optik-Design** www.mikro-optik.de	**EHD Imaging** www.ehd.de	**Helmut Hund** www.hund.de
BK Interferenzoptik www.interferenzoptik.de	**Computer BV** www.computerbv.de	**Eltrotec Sensor** www.eltrotec.com	**Holoeye Photonics** www.holoeye.com

IB/E Optics
www.ibe-optics.com

IDS
www.ids-imaging.com

iiM
www.iimag.de

Image House
www.imagehouse.dk

Image S
www.imagessrl.com

IMT
www.imtag.ch

Infaimon
www.infaimon.com

Ircam
www.ircam.de

IS Imaging Solutions
www.imaging-solutions.de

Japan F.A. Systems Corporation
www.jfas.co.jp

Jenoptik Laser, Optik, Systeme
www.jenoptik-los.de

Jenoptik Polymersystems
www.jenoptik-ps.de

Jos. Schneider Optische Werke
www.schneiderindustrialoptics.com

Karlheinz Hinze Optoengineering
www.hinze-opto.de

KeeKoon Electronics
www.keekoon.com

Keyence
www.keyence.de

Kowa
www.kowa-europe.com

Kvant
www.kvant.sk

Lambda Photometrics
www.lambdaphoto.co.uk

Laser 2000
www.laser2000.de

Laser Components
www.lasercomponents.com

Leica Geosystems
www.leica-geosystems.com/metrology

Lensation
www.lensation.de

Leoni
www.leoni-fiber-optics.com

Lincoln Laser Company
www.lincolnlaser.com

Linos Photonics
www.linos.de

LMI Technologies
www.lmitechnologies.com

LOT Oriel
www.lot-oriel.com

Luster LightVision Tech
www.lusterinc.com

Matrix Vision
www.matrix-vision.de

MaxxVision
www.maxxvision.com

Menzel Vision and Robotics
www.menzelab.com

Meuser Optik
www.meuser-optik.com

Micos
www.micos.ws

Microsystems
www.microsystems.it

Midwest Optical Systems
www.midopt.com

Moeller-Wedel Optical
www.moeller-wedel-optical.com

Molenaar Optics
www.molenaar-optics.com

Moritex
www.moritex.com

msiVision
www.msivision.com

Myutron
www.myutron.com

Navitar
www.navitar.com

NET
www.net-gmbh.com

NeuPro Solutions
www.neupro-solutions.com

Odem Technologies
www.odem.co.il

Olympus
www.olympus-europa.com

Omron
www.industrial.omron.de

Optec
www.optec.eu

Optics Balzers
www.opticsbalzers.com

Opto Engineering
www.opto-engineering.com

Opto Precision
www.optoprecision.de

Opto Sonderbedarf
www.opto.de

Optometron
www.optometron.de

Orbis
www.orbis.eu

Parameter
www.parameter.se

Pentax
www.pentax.de

Phaer
www.phaer.be

Photonic Products
www.photonic-products.com

pi4_robotics
www.pi4.de

POG Präzisionsoptik Gera
www.pog.eu

Polytec
www.polytec.com

Profactor
www.profactor.at

Qioptiq
www.qioptiq.com

Qualimatest
www.qmt.ch

Rauscher
www.rauscher.de

Resolve Optics
www.resolveoptics.com

RH Engineering
www.rhengineering.de

Schael-Optik
www.schael-optik-ltd.com

Schäfter + Kirchhoff
www.sukhamburg.de

Schmachtl
www.schmachtl.at

Second2None
www.visiondragon.com

Sedeco Vision Components
www.sedeco.nl

Seiwa Optical
www.seiwaopt.co.jp

Sill Optics
www.silloptics.de

Space
www.spacecom.co.jp

Spectros
www.spectros.ch

Spectrum Illumination
www.spectrumillumination.com

Stemmer Imaging
www.stemmer-imaging.com

STZ Qualitätssicherung und Bildverarbeitung
www.stz-ilmenau.de

Sugitoh
www.sugitoh.jp

Sunex
www.sunex.com

SVS Vistek
www.svs-vistek.com

Symco
www.symco.co.jp

Tamron
www.tamron.de

Tekno Optik
www.teknooptik.se

Tekstar Optical
www.tekstaroptical.com

The Imaging Source
www.theimagingnsource.com

Thermosensorik
www.thermosensorik.de

Vega Technology Group
www.vegatcgroup.com

Videology Imaging Solutions
www.videologyinc.com

Videor Technical
www.videor.com

Vision & Control
www.vision-control.com

Vision Light Tech
www.visionlighttech.com

Visionlink
www.visionlink.it

Visitool
www.visitool.de

Volpi
www.volpi.ch

VS Technology
www.vst.co.jp

Weiss Imaging and Solutions
www.weiss-imaging.de

ZygoLOT
www.zygolot.de

Processors, Interfaces, Cables, Peripherals

ABS
www.abs-jena.de

Active Silicon
www.activesilicon.com

Adaptive Vision
www.adaptive-vision.com

Aerotech
www.aerotech.com

Allied Vision Technologies
www.alliedvisiontec.com

Alysium-Tech
www.alysium-tech.com

AMS Technologies
www.ams.de

AnaLogic Computers
www.analogic-computers.com

Andon Electronics
www.andonelect.com

Arvoo Imaging Products
www.arvoo.com

autoVimation
www.autovimation.com

BAP Image Systems
www.bapis.de

Bock Optronics
www.bockoptronics.ca

Components Express
www.componentsexpress.com

Computer BV
www.computerbv.de

D.SignT
www.dsignt.de

Dalsa
www.dalsa.com

de Man Industrie-Automation
www.deman.de

Diaplous
www.diaplous.com

DSM Computer
www.dsm.ag

Eltec Elektronik
www.eltec.com

Eltrotec Sensor
www.eltrotec.com

Epix
www.epixinc.com

Fabrimex Systems
www.fabrimex-systems.ch

FiberVision
www.fibervision.de

Framos
www.framos.eu

G4 Technology
www.g4.com.tw

Gidel
www.gidel.com

GigaLinx
www.gigalinx.net

Hema
www.hema.de

HGV Vosseler
www.hgv.de

IDS
www.ids-imaging.com

igus
www.igus.de

Image House
www.imagehouse.dk

Image S
www.imagessrl.com

Imaging Solutions Group
www.isgchips.com

Imago
www.strampe.de

Infaimon
www.infaimon.com

Intercon1
www.intercon-1.com

Japan F.A. Systems Corporation
www.jfas.co.jp

Kamiera
www.kamiera.com

Lemo
www.lemo.com

Leoni
www.leoni-fiber-optics.com

LMI Technologies
www.lmitechnologies.com

Luster LightVision Tech
www.lusterinc.com

Matrix Vision
www.matrix-vision.de

Matrox Imaging
www.matrox.com/imaging

MaxxVision
www.maxxvision.com

MaZet
www.mazet.de

Menzel Vision and Robotics
www.menzelab.com

Micron
www.micron.com

Microsystems
www.microsystems.it

Mikrotron
www.mikrotron.de

Newnex Technology
www.newnex.com

Orbis
www.orbis.eu

Parameter
www.parameter.se

Phytec Messtechnik
www.phytec.de

pi4_robotics
www.pi4.de

Pleora Technologies
www.pleora.com

Schmachtl
www.schmachtl.at

Seidenader
www.seidenader.de

Seldes
www.seldes.com

Silicon Software
www.silicon-software.de

Stemmer Imaging
www.stemmer-imaging.com

STZ Qualitätssicherung und Bildverarbeitung
www.stz-ilmenau.de

Supercomputing Systems
www.scs-vision.ch

SVS Vistek
www.svs-vistek.com

Symco
www.symco.co.jp

The Imaging Source
www.theimagingnsource.com

Thinklogical
www.thinklogical.com

Unibrain
www.unibrain.com

ViDiSys
www.vidisys.de

Vision & Control
www.vision-control.com

Vision Tools
www.vision-tools.com

Vistas
www.vistas-gmbh.de

Xilinx
www.xilinx.com

AIDO
www.aido.es

Alfavision
www.alfavision.de

Alicona Imaging
www.alicona.com

Anafocus
www.anafocus.com

Austrian Research Centers
www.smart-systems.at

Awaiba
www.awaiba.com

BFI Optilas
www.bfioptilas.com

Breuckmann
www.breuckmann.com

Cmos Vision
www.cmosvision.com

CMOSIS
www.cmosis.com

Cognex
www.cognex.com

Collischon Optik-Design
www.mikro-optik.de

CSEM
www.csem.ch

CTR Carinthian Tech Research
www.ctr.at

Cypress Semiconductor
www.cypress.com

de Man Industrie-Automation
www.deman.de

Delta Digital Video
www.delta.dk

Docter Optics
www.docter-optics.com

Eltec Elektronik
www.eltec.com

Eltrotec Sensor
www.eltrotec.com

Entner Electronics
www.entner-electronics.com

Erhard + Leimer
www.erhardt-leimer.com

FiberVision
www.fibervision.de

Fraunhofer Allianz Vision
www.vision.fraunhofer.de

FRT Fries Research & Technology
www.frt-gmbh.com

GBS
www.gbs-ilmenau.de

Gevicam
www.gevicam.com

GFaI
www.gfai.de

Graphikon
www.graphikon.de

HaSoTec
www.hasotec.com

Helion
www.helionvision.com

HGV Vosseler
www.hgv.de

IDS
www.ids-imaging.com

Imaging Lab
www.imaginglab.it

Impuls
www.impuls-imaging.com

IMS Chips
www.ims-chips.de

Infaimon
www.infaimon.com

Isomorph
www.isomorph.it

Joanneum Research
www.joanneum.at

Kamera Werke Dresden
www.kwdo.de

Kamiera
www.kamiera.com

Kappa opto-electronics
www.kappa.de

Leica Geosystems
www.leica-geosystems.com/metrology

Lincoln Laser Company
www.lincolnlaser.com

LMI Technologies
www.lmitechnologies.com

Matrix Vision
www.matrix-vision.de

MaZet
www.mazet.de

Mikromak Service
www.mikromak.com

msiVision
www.msivision.com

Norpix
www.norpix.com

Opto Sonderbedarf
www.opto.de

Panavision Imaging
www.panavisionimaging.com

PCO
www.pco.de

Photonfocus
www.photonfocus.com

Phytec Messtechnik
www.phytec.de

pi4_robotics
www.pi4.de

Profactor
www.profactor.at

Sarnoff
www.sarnoff.com

Schäfter + Kirchhoff
www.sukhamburg.de

Sensor to Image
www.sensor-to-image.de

SmartSurv
www.smartsurv.de

SPG Data 3D
www.spgdata3d.com

SPIE
www.spieeurope.org

Stemmer Imaging
www.stemmer-imaging.com

STZ Qualitätssicherung und Bildverarbeitung
www.stz-ilmenau.de

Tekno Optik
www.teknooptik.se

Tema
www.temavisio.com

Thermosensorik
www.thermosensorik.de

Tichawa Vision
www.tichawa.de

Tordivel
www.scorpionvision.com

Univision
www.univision.it

Vega Technology Group
www.vegatcgroup.com

Vision & Control
www.vision-control.com

Vision Machines
www.vision-machines.com

Vision Tools
www.vision-tools.com

Vistek
www.vistekas.com

V-Research
www.v-research.at

Zertrox
www.zertrox.de

Soft ware

a&b software
www.ab-soft.com

ABW
www.abw-3d.de

Adaptive Vision
www.adaptive-vision.com

Alfavision
www.alfavision.de

Alicona Imaging
www.alicona.com

Alliance Vision
www.alliancevision.com

Alrad Imaging
www.alrad.co.uk

AMS Technologies
www.ams.de

AnaLogic Computers
www.analogic-computers.com

Andor Technology
www.andor.com

AOS Technologies
www.aostechnologies.com

Aqsense
www.aqsense.com

Artray
www.artray.co.jp

Asentics
www.asentics.de

Baumer
www.baumer.com

Braintech
www.braintech.com

Cimetrix
www.cimetrix.com

Cognex
www.cognex.com

Computer BV
www.computerbv.de

Cosyco
www.cosyco.de

Dalsa
www.dalsa.com

Data Vision
www.datvision.com

de Man Industrie-Automation
www.deman.de

dhs Solutions
www.dhssolution.com

Digital Surf
www.digitalsurf.com

Duwe 3D
www.duwe-3d.de

Dynalog
www.dynalog-us.com

ebs Automatisierte Thermographie und Systemtechnik
www.irpod.net

EHD Imaging
www.ehd.de

Eltec Elektronik
www.eltec.com

Eltrotec Sensor
www.eltrotec.com

Energid
www.energid.com

Epix
www.epixinc.com

Erhard + Leimer
www.erhardt-leimer.com

Euresys
www.euresys.com

EVT Eye Vision Techology
www.evt-web.com

Fabrimex Systems
www.fabrimex-systems.ch

Fast
www.fast-corp.co.jp

FDS Research
www.fdsresearch.si

FiberVision
www.fibervision.de

Flir Systems
www.flirthermography.de

Framos
www.framos.eu

FSI Technologies
www.fsinet.com

G4 Technology
www.g4.com.tw

GBS
www.gbs-ilmenau.de

Gefasoft
www.gefasoft.com

Geomagic
www.geomagic.com

Gevicam
www.gevicam.com

Goldlücke Ingenieurleistungen
www.giib.de

Graphikon
www.graphikon.de

HaSoTec
www.hasotec.com

HGV Vosseler
www.hgv.de

IB/E Optics
www.ibe-optics.com

IDS
www.ids-imaging.com

iiM
www.iimag.de

Image House
www.imagehouse.dk

Image S
www.imagessrl.com

Imagic
www.imagic-imaging.com

Imaging Lab
www.imaginglab.it

Imatec
www.imatec-bildanalyse.com

Impuls
www.impuls-imaging.com

INB Vision
www.inb-vision.com

Industrial Vision Systems
www.industrialvision.co.uk

Infaimon
www.infaimon.com

InRay Solutions
www.inrays.com

in-situ
www.in-situ.de

Ircam
www.ircam.de

IS Imaging Solutions
www.imaging-solutions.de

Isomorph
www.isomorph.it

Isra Vision
www.isravision.com

IVS
www.industrialvision.co.uk

Japan F.A. Systems Corporation
www.jfas.co.jp

JasVisio
www.visiomint.com

Joanneum Research
www.joanneum.at

Kappa opto-electronics
www.kappa.de

Karlheinz Hinze Optoengineering
www.hinze-opto.de

Klughammer
www.klughammer.de

Kvant
www.kvant.sk

Lambda Photometrics
www.lambdaphoto.co.uk

Leica Geosystems
www.leica-geosystems.com/metrology

Leica Microsystems
www.leica-microsystems.com

Leutron Vision
www.leutron.com

LMI Technologies
www.lmitechnologies.com

Luster LightVision Tech
www.lusterinc.com

Math & Tech
www.mathtech.de

Matrix Vision
www.matrix-vision.de

Matrox Imaging
www.matrox.com/imaging

MaxxVision
www.maxxvision.com

Menzel Vision and Robotics
www.menzelab.com

Metronom Automation
www.metronom-automation.de

Micro Epsilon
www.micro-epsilon.com

Microscan
www.microscan.com

Microsystems
www.microsystems.it

Mikromak Service
www.mikromak.com

Mitutoyo
www.mitutoyo.de

msiVision
www.msivision.com

MVTec Software
www.mvtec.com

National Instruments
www.ni.com

Neurocheck
www.neurocheck.com

Norpix
www.norpix.com

OBE Ohnmacht & Baumgärtner
www.trevista.net

Odem Technologies
www.odem.co.il

Olympus
www.olympus-europa.com

Omron
www.industrial.omron.de

Optical Research Associates
www.opticalres.com

Optis
www.optis-world.com

Optometron
www.optometron.de

Orbis
www.orbis.eu

Parameter
www.parameter.se

Photonfocus
www.photonfocus.com

pi4_robotics
www.pi4.de

Pleora Technologies
www.pleora.com

Polytec
www.polytec.com

Profactor
www.profactor.at

Qualimatest
www.qmt.ch

Rapidform
www.rapidform.com

Rauscher
www.rauscher.de

RH Engineering
www.rhengineering.de

Rubroeder
www.rubroeder.de

SAC
www.sac-vision.de

Schmachtl
www.schmachtl.at

Second2None
www.visiondragon.com

Sedeco Vision Components
www.sedeco.nl

SensorDesk
www.sensordesk.com

Silicon Software
www.silicon-software.de

Simon IBV
www.simon-ibv.de

SmartSurv
www.smartsurv.de

SPG Data 3D
www.spgdata3d.com

Stemmer Imaging
www.stemmer-imaging.com

STZ Qualitätssicherung und Bildverarbeitung
www.stz-ilmenau.de

Supercomputing Systems
www.scs-vision.ch

SVS Vistek
www.svs-vistek.com

Symco
www.symco.co.jp

Tekno Optik
www.teknooptik.se

Tema
www.temavisio.com

The Imaging Source
www.theimagingnsource.com

The MathWorks
www.mathworks.com

Thermosensorik
www.thermosensorik.de

Tordivel
www.scorpionvision.com

TriVision
www.trivision.dk

TYZX
www.tyzx.com

Univision
www.univision.it

Van de Loosdrecht Machine Vision
www.vdlmv.nl

Vega Technology Group
www.vegatcgroup.com

visicontrol
www.visicontrol.com

Visiolaser
www.vannier-photelec.fr/visiolaser

Vision & Control
www.vision-control.com

Vision Components
www.vision-components.com

Vision Machines
www.vision-machines.com

Vision N
www.vision-n.de

Vision Tools
www.vision-tools.com

Visionlink
www.visionlink.it

Vistek
www.vistekas.com

Vitronic
www.vitronic.com

Weiss Imaging and Solutions
www.weiss-imaging.de

Wenzel
www.wenzel-cmm.com

X-Rite
www.xrite.com

Zertrox
www.zertrox.de

Vision Sen Smart & Embedded Syste

Active Silicon
www.activesilicon.com

Adaptive Vision
www.adaptive-vision.com

AIT Göhner
www.aitgoehner.de

Alfavision
www.alfavision.de

AMS Technologies
www.ams.de

Applied Scintillation Technologies
www.appscintech.com

Asentics
www.asentics.de

Awaiba
www.awaiba.com

Banner Engineering
www.bannerengineering.com

Basler Vision Technologies
www.baslerweb.com

Baumer
www.baumer.com

Camsensor Technologies
www.camsensor.com

Cmos Vision
www.cmosvision.com

CMOSIS
www.cmosis.com

Cognex
www.cognex.com

Compar
www.compar.ch

Computer BV
www.computerbv.de

Computer Dynamics
www.cdynamics.com

Cosyco
www.cosyco.de

Dalsa
www.dalsa.com

Datalogic Automation
www.automation.datalogic.com

Datasensor
www.datasensor.com

de Man Industrie-Automation
www.deman.de

Diaplous
www.diaplous.com

Directed Perception
www.DPerception.com

di-soric
www.di-soric.de

Eltec Elektronik
www.eltec.com

Eltrotec Sensor
www.eltrotec.com

Erhard + Leimer
www.erhardt-leimer.com

EVT Eye Vision Techology
www.evt-web.com

Fabrimex Systems
www.fabrimex-systems.ch

FastVision
www.fast-vision.com

Festo
www.festo.com

FiberVision
www.fibervision.de

Finger
www.finger-kg.de

FSI Technologies
www.fsinet.com

G4 Technology
www.g4.com.tw

Graphikon
www.graphikon.de

Hans Turck
www.turck.com

Hema
www.hema.de

HGV Vosseler
www.hgv.de

IBN
www.ibn-gmbh.de

ifm Electronic
www.ifm.de

Image House
www.imagehouse.dk

Image S
www.imagessrl.com

Imaging Solutions Group
www.isgchips.com

Imago
www.strampe.de

Imagsa Technologies
www.imagsa.com

IMR Automatisierungstechnik
www.imr-le.de

Infaimon
www.infaimon.com

IOS
www.ios-web.de

IOSS
www.ioss.de

ipf Electronic
www.ipf-electronic.de

IS Imaging Solutions
www.imaging-solutions.de

Isra Vision
www.isravision.com

ISW
www.isw-gmbh.biz

Itava
www.itava.de

Japan F.A. Systems Corporation
www.jfas.co.jp

K + P Krempien + Petersen
www.kup-image.de

Kamiera
www.kamiera.com

Keyence
www.keyence.de

Kontron
www.kontron.com

Lambda Photometrics
www.lambdaphoto.co.uk

Leutron Vision
www.leutron.com

Leuze Electronic
www.leuze.com

LMI Technologies
www.lmitechnologies.com

Lord Ingenierie
www.lord-ing.com

Luster LightVision Tech
www.lusterinc.com

Matrix Vision
www.matrix-vision.de

Matrox Imaging
www.matrox.com/imaging

MaxxVision
www.maxxvision.com

MaZet
www.mazet.de

Menzel Vision and Robotics
www.menzelab.com

Micro Epsilon
www.micro-epsilon.com

Microscan
www.microscan.com

Microsystems
www.microsystems.it

msiVision
www.msivision.com

National Instruments
www.ni.com

NeuPro Solutions
www.neupro-solutions.com

Neuricam
www.neuricam.com

Norpix
www.norpix.com

sors,
Caméras
d
ems

OBE Ohnmacht & Baumgärtner
www.trevista.net

Odem Technologies
www.odem.co.il

Omron
www.industrial.omron.de

Opto Sonderbedarf
www.opto.de

Orbis
www.orbis.eu

Panasonic Electric Works
www.panasonic-electric-works.de

Parameter
www.parameter.se

Pepperl & Fuchs
www.pepperl-fuchs.com

Peter Scholz Software + Engineering
www.scholzsue.de

Phytec Messtechnik
www.phytec.de

pi4_robotics
www.pi4.de

PMDTec
www.pmdtec.com

Pollux
www.pollux.com.br

Polytec
www.polytec.com

PPT Vision
www.pptvision.com

Profactor
www.profactor.at

Pulsotronic
www.bildverarbeitung.pulsotronic.de

Qualimatest
www.qmt.ch

Rauscher
www.rauscher.de

RSB Optotechnik
www.rsb-optotechnik.de

SAC
www.sac-vision.de

Schmachtl
www.schmachtl.at

Schunk
www.schunk.com

Second2None
www.visiondragon.com

Sedeco Vision Components
www.sedeco.nl

SensoPart Industriesensorik
www.sensopart.de

Sensor to Image
www.sensor-to-image.de

Sharp Microelectronics
www.sharpsme.com

Sick
www.sick.com

Siemens
www.siemens.de/simatic-sensors/mv

SKS Vision Systems
www.visionsystems.fi

Smartray
www.smartray.de

SmartSurv
www.smartsurv.de

Soliton Technologies
www.solitontech.com

Sony
www.sonybiz.net/vision

Stemmer Imaging
www.stemmer-imaging.com

Supercomputing Systems
www.scs-vision.ch

SVS Vistek
www.svs-vistek.com

Symco
www.symco.co.jp

Tattile
www.tattile.com

Tekno Optik
www.teknooptik.se

Tichawa Vision
www.tichawa.de

topSenso
www.topsenso.de

Tordivel
www.scorpionvision.com

Vega Technology Group
www.vegatcgroup.com

Vialux
www.vialux.de

Videor Technical
www.videor.com

visicontrol
www.visicontrol.com

Visiolaser
www.vannier-photelec.fr/visiolaser

Vision & Control
www.vision-control.com

Vision Components
www.vision-components.com

Vision Tools
www.vision-tools.com

Visionlink
www.visionlink.it

Vistek
www.vistekas.com

VRmagic
www.vrmagic.com

Webview
www.webspec.com

wenglor sensoric
www.wenglor.com

Werth Messtechnik
www.werthmesstechnik.de

Wintriss Engineering
www.weco.com

Zertrox
www.zertrox.de

Vision Systems, T Solutions, Integ Service

3D Alliance
www.3dalliance.de

3D Shape
www.3d-shape.com

a&a technologies
www.aa-technologies.de

ABB
www.abb.com

Act Smartware
www.act-smartware.de

Adaptive Vision
www.adaptive-vision.com

Adept Electronic Solutions
www.adept.net.au

Adept Technology
www.adept.de

AGR International
www.agrintl.com

AIT Göhner
www.aitgoehner.de

aku automation
www.aku-automation.de

alfa vision systems
www.alfavisionsystems.com

Alfavision
www.alfavision.de

Alliance Vision
www.alliancevision.com

Applied Vision
www.appliedvision.com

ASB automation technology
www.asb-technologie.de

Asentics
www.asentics.de

ATM Vision
www.atmvision.com

ATN Automatisierungstechnik
www.atn-gmbh.com

Austrian Research Centers
www.smart-systems.at

Automation Technology
www.automationtechnology.de

Automation W+R
www.automationwr.de

Autoware
www.autoware.it

AVT Advanced Vision Technology
www.avt-inc.com

Balluf
www.balluf.de

Basler Vision Technologies
www.baslerweb.com

Baumer
www.baumer.com

Beratronic
www.beratronic.de

Bertram Elektrotechnik
www.bertram-bevern.de

Bi-Ber
www.bilderkennung.de

Böwe Systec
www.bowesystec.com

Braintech
www.braintech.com

Brainware Solutions
www.brainware-solutions.de

BST International
www.bst-international.com

Camsensor Technologies
www.camsensor.com

Carl Zeiss OIM
www.zeiss.de

China Daheng Group
www.daheng-image.com

Cognex
www.cognex.com

Coherix
www.coherix.com

Compar
www.compar.ch

Computer BV
www.computerbv.de

Cosyco
www.cosyco.de

Cruse Leppelmann Kognitionstechnik
www.clkgmbh.de

Dalsa
www.dalsa.com

Datalogic Automation
www.automation.datalogic.com

Datapixel
www.datapixel.com

Datasensor
www.datasensor.com

de Man Industrie-Automation
www.deman.de

DE software & control
www.de-gmbh.com

desconpro engineering
www.desconpro.de

Diaplous
www.diaplous.com

Digital West Imaging
www.DigitalWestimaging.com

Divisoft
www.divisoft.com

DMC Vision & Motion
www.dmc-vision-motion.de

Dr. Schenk Industriemesstechnik
www.drschenk.com

Dr. Schwab Inspection Technology
www.schwabinspection.com

Dunkley International
www.dunkleymachinevision.com

Dutch Vision Systems
www.dvs-vision.de

e3tam
www.e3tam.com

Eckelmann
www.eckelmann.de

Edixia
www.edixia.com

EHR
www.ehr.de

Eines
www.eines.es

Electronic Systems
www.electronicsystems.it

Ellips
www.ellips.nl

Eltromat
www.eltromat.de

Eltrotec Sensor
www.eltrotec.com

Emhart Glass
www.emhartglass.com

Epix
www.epixinc.com

Erhard + Leimer
www.erhardt-leimer.com

EVK DI Kerschaggl
www.evk.biz

EVT Eye Vision Techology
www.evt-web.com

Fast
www.fast-corp.co.jp

Faude Automatisierungstechnik
www.faude.de

FAW Freudenberg Anlagen- und Werkzeugtechnik
www.faw-freudenberg.de

FDS Research
www.fdsresearch.si

FiberVision
www.fibervision.de

Finger
www.finger-kg.de

Fritz Pauker Ingenieure
www.pauker-ingenieure.de

Fuchs engineering
www.fuchs-engineering.de

Fuetec
www.fuetec.de

Futec
www.futec.co.jp

G4 Technology
www.g4.com.tw

Turnkey ration S

GBS
www.gbs-ilmenau.de

Gefasoft
www.gefasoft.com

Gefat
www.gefat.de

GF Messtechnik
www.gfmesstechnik.de

GFaI
www.gfai.de

Gidel
www.gidel.com

Goldlücke Ingenieurleistungen
www.giib.de

GOM
www.gom.com

Göpel electronic
www.goepel.com

GPP Chemnitz
www.gppc.de

Graphikon
www.graphikon.de

HaSoTec
www.hasotec.com

Heitec
www.heitec.de

Hengstmann Solutions
www.hengstmann.com

HGV Vosseler
www.hgv.de

i2s
www.i2s-linescan.com

I3 tech
www.i3tech.de

ibat
www.ibat-berlin.de

ibea
www.ibea.de

Icos Vision Systems
www.icos.be

iiM
www.iimag.de

Ikegami
www.ikegami.de

Image House
www.imagehouse.dk

Image S
www.imagessrl.com

i-mation
www.i-mation.de

imess
www.imess.de

Impuls
www.impuls-imaging.com

IMR Automatisierungstechnik
www.imr-le.de

INB Vision
www.inb-vision.com

Industrial Vision Systems
www.industrialvision.co.uk

Infaimon
www.infaimon.com

InfraTec
www.infratec.de

inos Automationssoftware
www.inos-automation.com

InRay Solutions
www.inrays.com

Insensiv
www.insensiv.de

in-situ
www.in-situ.de

Inspectron
www.inspectron.ch

InSystems Automation
www.insystems.de

Intego
www.intego.de

Intopii
www.intopii.fi

IOS
www.ios-web.de

IOSS
www.ioss.de

Ipasort
www.ipasort.com

IS Imaging Solutions
www.imaging-solutions.de

Isa Industrielektronik
www.isaweiden.de

Isomorph
www.isomorph.it

Isra Vision
www.isravision.com

ISW
www.isw-gmbh.biz

Itech engineering
www.itech-ag.ch

IVS
www.industrialvision.co.uk

J&P Vision
www.jupvision.de

Japan F.A. Systems Corporation
www.jfas.co.jp

JLI Vision
www.jli.dk

Joanneum Research
www.joanneum.at

K + P Krempien + Petersen
www.kup-image.de

Kaiser Computersysteme
www.isotronika.de

Kdorf Automation
www.kdorf.de

Keyence
www.keyence.de

Kirin Techno-System
www.kirintechno.co.jp

KMS Vision Systems
www.kms-vision.de

L&_P
www.lp-gmbh.de

Laetus
www.laetus.com

Leuze Electronic
www.leuze.com

Limess
www.limess.com

Lincoln Laser Company
www.lincolnlaser.com

Machine Vision Technology
www.machine-vision-technology.co.uk

Menzel Vision and Robotics
www.menzelab.com

Meta Vision Systems
www.meta-mvs.co.uk

Metronom Automation
www.metronom-automation.de

mevisco
www.mevisco.com

Micro Epsilon
www.micro-epsilon.com

Microscan
www.microscan.com

Mikrotron
www.mikrotron.de

Modi Modular Digits
www.modi-gmbh.de

Moser Industrielektronik
www.moser-gmbh.de

MSC Inspection
www.msc.fr

msiVision
www.msivision.com

NeuPro Solutions
www.neupro-solutions.com

Neuricam
www.neuricam.com

Neurocheck
www.neurocheck.com

Neurotechnology
www.neurotechnology.com

Nokra
www.nokra.de

Norpix
www.norpix.com

Northwire
www.northwire.com

OCS
www.ocsgmbh.com

Octum
www.octum.de

Omron
www.industrial.omron.de

Opsis
www.opsis.de

Optel Vision
www.optelvision.com

Opto Fidelity
www.optofidelity.com

OptoNova
www.optonova.se

Orbis
www.orbis.eu

Orbotech
www.orbotech.com

Orus Integration
www.orusintegration.com

Otto Vision Technology
www.otto-jena.de

Panasonic Electric Works
www.panasonic-electric-works.de

Parameter
www.parameter.se

Pattern Recognition Company
www.pattern-recognition-company.de

PCE Pharmacontrol
www.pharmacontrol.de

Pepperl & Fuchs
www.pepperl-fuchs.com

Perceptron
www.perceptron.com

Peter Scholz Software + Engineering
www.scholzsue.de

Phytec Messtechnik
www.phytec.de

pi4_robotics
www.pi4.de

Pilz
www.pilz.de

Pixargus
www.pixargus.de

Plasmo Industrietechnik
www.plasmo.eu

POG Präzisionsoptik Gera
www.pog.eu

Pollux
www.pollux.com.br

Polygon
www.polygon-technology.de

PPT Vision
www.pptvision.com

Pressco Technology
www.pressco.com

Profactor
www.profactor.at

Prüftechnik Schneider & Koch
www.prsuk.de

Pulsotronic
www.bildverarbeitung.pulsotronic.de

Qualimatest
www.qmt.ch

Quiss
www.quiss.com

R&W Industrieautomation
www.r-u-w.de

Radix Controls
www.radixcontrols.com

rbc robotics
www.rbc-robotics.de

Recognitec
www.recognitec.de

RH Engineering
www.rhengineering.de

Rohwedder
www.rohwedder.com

RSB Optotechnik
www.rsb-optotechnik.de

Rubroeder
www.rubroeder.de

Rudolph Technologies
www.rudolphtech.com

SAC
www.sac-vision.de

Scanware electronic
www.scanware.de

Schmachtl
www.schmachtl.at

Schönherr Elektronik
www.schoenherr-elektronik.com

Second2None
www.visiondragon.com

Seidenader
www.seidenader.de

Sensor Control
www.sensorcontrol.com

Seritec
www.seritec.de

Servo-Robot
www.servorobot.com

Sidonia Systems
www.sidoniasystems.de

Signum
www.signum-vision.de

Simac Masic
www.simacmasic.nl

Simon IBV
www.simon-ibv.de

SL Tec
www.sltec.de

Smartray
www.smartray.de

Solex
www.solexvision.com

Solving3D
www.solving3d.de

Soma
www.soma.de

SPG Data 3D
www.spgdata3d.com

Steinbichler Optotechnik
www.steinbichler.com

Stöhrmann Systemtechnik
www.stöhrmann.de

Stratec Control Systems
www.bbull.com

STZ Qualitätssicherung und Bildverarbeitung
www.stz-ilmenau.de

Sundance Multiprocessor Technology
www.sundance.com

Surface Inspection
www.surface-inspection.com

SVS Vistek
www.svs-vistek.com

Symacon Engineering
www.symacon.de

Symetix
www.symetix.com

SysCon
www.syscon-vision.de

Systech
www.systech-tips.com

Tattile
www.tattile.com

TechnoTeam
www.technoteam.de

Tema
www.temavisio.com

Thermosensorik
www.thermosensorik.de

Tichawa Vision
www.tichawa.de

Tordivel
www.scorpionvision.com

TriVision
www.trivision.dk

TST Technological Solutions
www.tst.pt

TYZX
www.tyzx.com

Univision
www.univision.it

Vega Technology Group
www.vegatcgroup.com

Vester Elektronik
www.vester.de

Videometer
www.videometer.com

Vigitek
www.vigitek.com

Viscom
www.viscom.com

visicontrol
www.visicontrol.com

Visimation
www.visimation.de

Visio Nerf
www.visionerf.com

Visiolaser
www.vannier-photelec.fr/visiolaser

Vision Automation
www.visionautomation.dk

Vision Experts
www.vision-experts.com

Vision Machines
www.vision-machines.com

Vision Projekt
www.vision-projekt.de

Vision Tools
www.vision-tools.com

vision-consult Bildverarbeitung
www.vision-consult.com

Visionlink
www.visionlink.it

VisioTek
www.visiotek.com.tr

Visolution
www.visolution.de

Visotect
www.visotect.de

Vistek
www.vistekas.com

Visuelle Technik
www.visuelle-technik.de

Vitronic
www.vitronic.com

VMT
www.vmt-gmbh.com

V-Research
www.v-research.at

Weber Systemtechnik
www.wesys.de

Weiss Imaging and Solutions
www.weiss-imaging.de

Weitblick Systems
www.weitblick-systems.at

wenglor sensoric
www.wenglor.com

Wente/Thiedig
www.wente-thiedig.de

Wintriss Engineering
www.weco.com

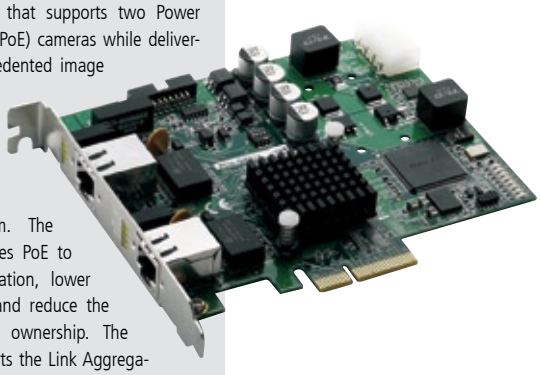
Wolf Systeme
www.wolfsysteme.de

Zertrox
www.zertrox.de

Ziemann & Urban
www.ziemann-urban.de

PCIe 2-CH Gigabit Ethernet Frame Grabber Supports Power over Ethernet

AdLink's GIE62+ is a PCI Express x4 lane frame grabber that supports two Power over Ethernet (PoE) cameras while delivering an unprecedented image acquisition rates of up to 2 Gbps and long cable distances of up to 100 m. The GIE62+ provides PoE to simplify installation, lower maintenance, and reduce the total cost of ownership. The GIE62+ supports the Link Aggregation Control Protocol to offer an inexpensive way to establish a double-speed backbone network that transfers much more data than any one single Gigabit Ethernet port or device. The GIE62 is also suited for automation applications by providing two of each isolated TTL digital inputs, outputs, and programmable trigger output pulses to connect to external devices such as position sensors and strobe lighting. AdLink's digital imaging product portfolio for machine vision applications also includes a variety of the PCIe frame grabbers for IEEE 1394.b, CameraLink, and GigE Vision interfaces.



ADLINK TECHNOLOGY INC.

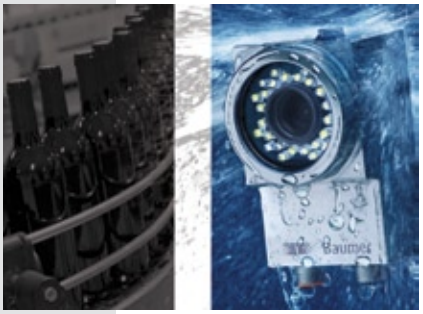
Adlink Technology Inc.
Nord Carree 3
40477 Düsseldorf
Germany
Tel.: +49 211 495 55 52
Fax: +49 211 495 55 57
emea@adlinktech.com
www.adlinktech.com

D-1

See our profile on page 32

VeriSens Vision Sensors with Ethernet Interface and Stainless Steel Housings

Baumer introduces the new vision sensors Series 1500 and 1800 with stainless steel housings, IP 69 K protection and Ethernet interfaces. With these new features, the VeriSens vision sensors can meet tough hygienic and bio-cleaning requirements while still offering flexible integration and reliable operation. Their powerful inspection, identification and character recognition capabilities can be applied with confidence, improving process control. For instance, in the food industry, packaged foods can be inspected while also reading the "best-before" dates. Also, by using the internal Ethernet interface, the sensors can be quickly reconfigured for other applications and a standard web browser can be used for captured image visualization.



Baumer

Baumer GmbH
Pfingstweide 28
61169 Friedberg
Germany
Tel.: +49 6031 60 07 0
Fax: +49 6031 60 07 70
sales.de@baumer.com
www.baumer.com/verisens

F-1

See our profile on page 25

Green PowerLine Laser

The thermoelectrically cooled green powerline laser was one of the high-lights at this year's Vision show in Stuttgart.
Green PowerLine structured light laser offers a thermoelectric system and fan that maintains a constant laser diode temperature, resulting in better wavelength, power, and pointing stabilities. The Green PowerLine design makes focusing even easier with the focus adjusting screw located directly on the body of the laser.

High Visibility, High Contrast Green Beam

A green beam can provide better contrast on red hot metal or wood. Another advantage is that a green beam is more visible to the human eye than red, thereby making the relative eye response to the green much higher. For the same power, a green beam (532 nm) will be better perceived by the human eye than a red beam (635 nm).
Applications are hot steel inspection, glass inspection, outdoor applications, positioning, R&D
Since 1986 Laser 2000 GmbH is a supplier of high technology in the field of lasers, micromachining equipment, optics, and fiber optic equipment. Our products are designed to meet the challenges of both research and industrial production as well as your actual or future requirements of your applications.

LASER 2000
The Future of Photonics

Laser 2000 GmbH
Argelsrieder Feld 14
82234 Wessling
Germany
Tel.: +49 8153 405 0
Fax: +49 8153 405 33
contact@laser2000.de
www.laser2000.de

M-10

See our profile on page 44

m-u-t: Efficient Photonic Solutions

Founded in 1995 and based in Wedel near Hamburg, Germany, m-u-t has become an internationally known high tech company. Its core competence lies in "Photonics", the combination of optics, electronics and complementary technologies for customized solutions. The stock listed company is present in the most important high tech markets China, Europe and Northern America with its own sales offices.

Turning Ideas into Products

The biggest strength of m-u-t is its comprehensive approach, enabling it to turn new ideas rapidly into marketable products. Whatever our customer's requirements in this business lines are: The customer has got the initial idea and together with m-u-t's competence it becomes a state-of-the-art product.

A Wide Range of Products

The know-how of m-u-t can be applied to a wide range of products. Apart from scanning systems, further business segments are spectroscopy, where our precise measurement techniques assure quality in mobile applications; laboratory automation in which our reliable technology replaces routine work and increases sorting quality; early fire detection appliances for cargo compartments of aircrafts.

m-u-t AG
Am Marienhof 2
22880 Wedel
Germany
Tel.: +49 (0) 4103-9308-0
Fax: +49(0) 4103-9308-99
info@mut-group.com
www.mut-group.com

HH-4

See our profile on page 46

SAC System Solutions for Machine Vision

SAC system solutions guarantee the faultless delivery of customer's products and meet highest requirements concerning optical quality assurance. Production processes that depend on absolute accuracy and minimal fault tolerance will be controlled by dint of SAC.
With over 13 years of experience, SAC realizes individual solutions in every industry sector worldwide.
In several fields SAC acquired special competences:

- In the field of 3D inspection, SAC offers customized module solutions, e.g. for pin control in plugs or car tyre inspection, and designed furthermore the system Pulsar, which is based on the fringe projection method. SAC Pulsar is perfectly suitable to measure smooth or curved, diffuse reflected surfaces.
- The SAC standardised testing device for toothing inspection has already assembled every required constituents and can be easy and quickly integrated on the spot through its compact construction.
- For surface inspection of continuous materials, e.g. paper, textile, metal, SAC designed VisionLine, a modular structured web inspection system that inspects in realtime the continuous material's surface for homogeneity and can be adapted in every production process.

SAC Sirius Advanced Cybernetics GmbH
Am Sandfeld 15
76149 Karlsruhe
Germany
Tel.: +49 721 60 543 000
Fax: +49 721 60 543 200
sales@sac-vision.net
www.sac-vision.net

KA-9

See our profile on page 50

Preview

Look ahead to our first issue of 2010:

INSPECT 1/2010 will be published in March 2010. A special focus will be on machine vision and optical metrology for factory automation.

Automation of manufacturing processes with 2D and 3D robot vision will be featured as well as product identification by making use of product features, data matrix code or barcode, yield increase with automated quality inspection, and in-line and offline metrology in production environments.

Trade show pre-views for the Hannover Trade show, the VTX in Birmingham and the Machine Vision China in Shanghai will provide up-to-date information for your planning.

IMPRINT

Published by
GIT VERLAG GmbH & Co. KG
Rößlerstr. 90
64293 Darmstadt, Germany
Tel.: +49/6151/8090-0
Fax: +49/6151/8090-144
info@gitverlag.com
www.gitverlag.com

Managing Directors
Dr. Michael Schön, Bijan Ghawami

Publishing Director
Gabriele Jansen
Tel.: +49/6151/8090-153
gabriele.jansen@wiley.com

Editors
Dr. Peter Ebert
Tel.: +49/6151/8090-162
peter.ebert@wiley.com

Andreas Grösslein
Tel.: +49/6151/8090-163
andreas.groesslein@wiley.com

Stephanie Nickl
Tel.: +49/6151/8090-142
stephanie.nickl@wiley.com

Editorial Assistant
Bettina Schmidt
Tel.: +49/6151/8090-141
bettina.schmidt@wiley.com

Scientific Advisor
Prof. Dr. C. Heckenkamp
Darmstadt, University of Applied Sciences

Segment Manager
Oliver Scheel
Tel.: +49/6151/8090-196
oliver.scheel@wiley.com

Sales Representatives
Claudia Brandstetter
Tel.: +49/89/43749678
claudia.brandst@t-online.de

Manfred Höring
Tel.: +49/6159/5055
media-kontakt@t-online.de

Dr. Michael Leising
Tel.: +49/3603/893112
leising@leising-marketing.de

Dirk Vollmar
Tel.: +49/6159/5055
media-kontakt@morkom.net

Production
GIT VERLAG GmbH & Co. KG
Christiane Potthast
Claudia Vogel (Sales Administrator)
Michaela Mietzner, Katja Mink (Layout)
Elke Palzer, Ramona Rehbein (Litho)

Reprints
Christine Mühl
Tel.: +49/6151/8090-169
christine.muehl@wiley.com

Bank Account
Dresdner Bank Darmstadt, Germany
Account No. 0171550100
Routing No. 50880050

Circulation
20,000 copies

Advertising price list from October 4st 2009

Individual Copies
Eight issues € 45,00; single copy € 14,50 plus postage.
Pupils and students receive a discount of 50 % at sight of a valid certificate. Subscription orders can be revoked within 1 week in writing. Dispatch complaints are possible only within four weeks after publishing date. Subscription cancellations are accepted six weeks before end of year.

Specially identified contributions are the responsibility of the author. Manuscripts should be addressed to the editorial office. We assume no liability for unsolicited, submitted manuscripts. Reproduction, including excerpts, is permitted only with the permission of the editorial office and with citation of the source.
The publishing house is granted the exclusive right, with regard to space, time and content to use the works/editorial contributions in unchanged or edited form for any and all purposes any number of times itself, or to transfer the rights for the use of other organizations in which it holds partnership interests, as well as to third parties. This right of use relates to print as well as electronic media, including the Internet, as well as databases/data carriers of any kind.

Material in advertisements and promotional features may be considered to represent the views of the advertisers and promoters.

All names, designations or signs in this issue, whether referred to and/or shown, could be trade names of the respective owner.

Print
Frotscher Druck
Riedstr. 8, 64295 Darmstadt

Printed in Germany
ISSN 1616-5284

The English language ePaper version of the INSPECT is mailed to 14,000 recipients worldwide.
The German language printed version has a circulation of 20,000 issues.

emva
european machine vision association

EMVA Business Conference 2010

8th European Machine Vision Business Conference
April 16th and April 17th, 2010
Istanbul, Turkey

International platform for networking and business intelligence.
Where machine vision business leaders meet.

www.emva.org

Happy new VISION

Packed halls, beaming faces and a terrific party.
We would like to thank all the exhibitors and visitors of VISION 2009 for this successful event and look forward to doing it all again next year.

It's a VISION – it's a community.

VISION 2010

23rd International Trade Fair for Machine Vision and Identifictaion Technologies

Messe Stuttgart
9 to 11 Nov. 2010

www.vision-messe.de