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**Perspective: Short-wave Infrared Cameras turn Invisible to Visible**

**Seeing beyond what the human eye can see and detecting additional image details are essential for various applications in science and industrial inspection. The use of infrared cameras becomes increasingly crucial for machine vision applications in order to obtain analyzable, significant images.**

**With its Goldeye camera family, Allied Vision offers several short wave infrared models for the spectral range of 900 nm to 1,700 nm. Product Manager Jens Hashagen knows what is important when using SWIR technology.**

**What aspects need to be respected when choosing the right SWIR camera?**

The application area for SWIR cameras ranges from the inspection of semiconductors and solar cells as well as laser beam profiling to measuring the water content of plants. Each of these applications are different and, therefore, have different demands required of the SWIR camera. It is important to clearly define the requirements and goals of each project from the beginning. The properties of the examined material (such as light reflection and absorption) determine the ideal spectral range that can be adjusted by using appropriate filters and lighting.

In comparison to CCD and CMOS sensors, dark current is relatively high with SWIR sensors. For applications requiring long exposure times, a special sensor cooling can reduce the dark current noise and optimize the quality of the pictures.

Moreover, the interface used for the data transfer is very important. If, for example, there is a great distance between the camera and the PC, data must be transmitted by long cables. Using GigE Vision interface cables, with lengths up to 100 meters and Power over Ethernet capabilities, cabling can be reduced.

Finally, several important key factors should have priority: the required resolution, pixel size, needed processing speed and price margin have to be balanced and taken into consideration. In the end, they indicate the right choice for sensor and camera model.

**How does Allied Vision support the user selecting the right camera?**

For us, being close to our customer means that we ask the right questions in order to tailor solutions to their needs and provide support where it matters most.

Based on the provided information, we recommend the fitting solution, not only regarding the camera, but also suitable optics with necessary filters, the appropriate accessories and the best software integration.

The support for infrared cameras can go as far as testing customer samples in our laboratories in order to detect which combination of camera and accessories obtains the best result.

When using our „Test-Your-Sample service“, the customer specifies all requirements concerning the properties of the inspected object, the application’s setup and the target. Once the laboratory tests are completed, the customer will receive a report with recommendations including the type of camera, the correct configuration and the necessary accessories.

In addition, our modular concept allows the flexibility to combine different options (mounts, filters, interfaces) and enables the customer to choose the perfect solution.

**What makes the difference between Allied Vision Goldeye SWIR-Cameras and other products?**

Allied Vision’s short-wave infrared cameras are specially developed, produced and optimized for Machine Vision applications. That means, above all, they not only support the standard interfaces (such as GigE-Vision or CameraLink), but also specific Machine Vision features, for example Region of Interest, Look-up Tables, diverse Trigger options and many more image acquisition control funktions. Professional built-in image correction and a relatively strong sensor cooling ensure an outstanding image quality.

High frame rates, numerous I/O control options, fixable connections as well as various mounting possibilities and multiple mounting options (C-Mount, F-Mount und M42-Mount) complete the cameras benefits.

Because of its special suitability for Machine Vision applications and excellent performance, the high-speed Goldeye G-033 camera (640x512 Pixels, 301 fps) received a Gold Level Innovators Award from Vision Systems Design earlier this year.

**What was the reason for developing the new model Goldeye G-008 SWIR?**

The use of short-wave infrared in machine vision is quite expensive due to high sensor production costs. The higher the resolution, the higher the price. That is why some manufacturers try to offer alternative solutions. They use either Near Infrared cameras (NIR) that are sensitive up to 1,100 nm. Or, they count on cameras with a special coating that transforms the infrared waves into visible light. However, the images of these camera solutions are not as performant as SWIR images because they do not possess the required sensitivity or produce images with high noise.

For cost sensitive applications where high resolution is less important (for example temperature detection in the steel industry or the inspection of hot gas container), Allied Vision has developed the Goldeye G-008. This camera is equipped with a small QVGA sensor (320 x 256 Pixels) and as a result, its price could significantly be reduced.

Users of the Goldeye G-008 SWIR won’t have to trade off quality or speed for the low price. The new model has all the qualities of the popular Goldeye family. The G-008 camera is fitted with the same features as models with higher resolution (G-032 und G-033) and delivers pin sharp images at 344 frames per second.

**Profile of Allied Vision**

For over 25 years, Allied Vision has been helping people to see the bigger picture. Allied Vision supplies camera technology and image capture solutions for industrial inspection, science, medicine, traffic monitoring and many more application areas in digital imaging. With a deep understanding of customers’ needs, Allied Vision finds individual solutions for every application, a practice which has made Allied Vision one of the leading camera manufacturers worldwide in the machine vision market. The company has eight locations in Germany, Canada, the United States, Singapore and China and is represented by a network of sales partners in over 30 countries. [www.alliedvision.com](http://www.alliedvision.com)

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