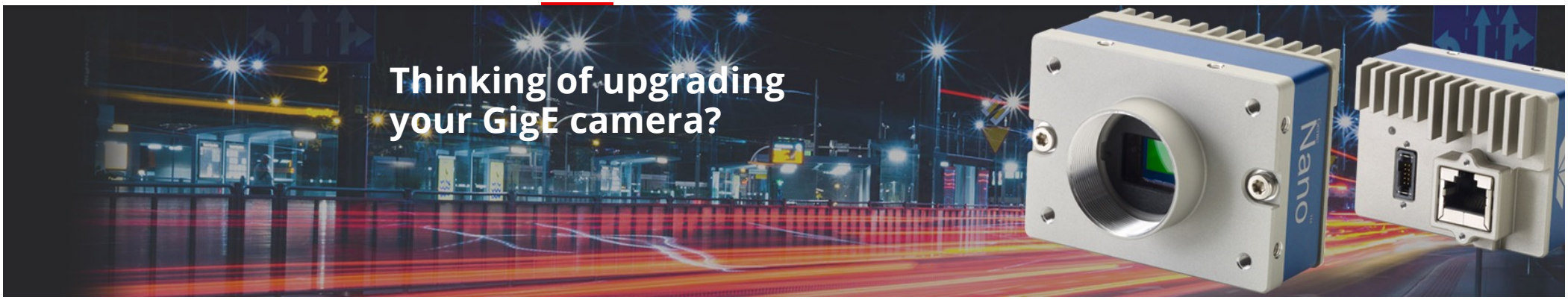

WHY THE UPGRADE TO 5GIGE IS SO IMPORTANT

Interview with Klaus Mähler, Portfolio Manager Camera and Acquisition, STEMMER IMAGING

GigE technology has revolutionised high performance industrial cameras used over Ethernet. Since 2006 we have gone from the original GigE cameras to 5GigE, 10GigE and even 25GigE cameras.

The latest image sensors provide high resolution images with high frame rates and when coupled with the evolution of data interfaces, you have too many options and configurations to choose from. Some guidance is clearly required.

COMMON QUESTIONS ARE ...

What are the limitations of my existing set-up? ## Do I need to upgrade my cameras, network, or both? ## How do I ensure that everything works together? ## Do I need to buy the highest resolution camera? ## I want x number of cameras feeding back to y number of workstations. How do I set this up?

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Klaus Mählert, STEMMER IMAGING

To help demystify the latest trends in GigE vision we conducted an interview with Klaus Mählert, our Camera & Acquisition Portfolio Manager.

Klaus, please can you explain the evolution of the GigE Vision standard in the machine vision industry?

Of course. Back in 2006, when the demand for increased frame rates and data transfer was rising, a group of 12 companies defined the **GigE Vision standard**. **GigE Vision enabled the capture of high-resolution images and their transmission across existing Ethernet network cables up to 90m in length.** The standard is now widely used across the industry, and there are over 50 member companies. GigE Vision has become widely accepted and allows for multiple cameras connected to a single PC. The great thing about it is that, due to Power Over Ethernet technology, a single cable is used to power, configure, and control the camera.

Although new interfaces have been established, in the meantime, cameras with GigE Vision interface have retained a considerable market share over many years, especially due to the flexible network topologies and cable lengths. Since 2011, the new 2.0 version of the standard supports Ethernet NBASE-T technology with 5 Gbps, 10 Gbps and 25 Gbps and additional functions like synchronisation with PTP (IEEE1588) and image compression.

What has led to the new developments of cameras with the Gigabit Ethernet interface based on NBASE-T technology?

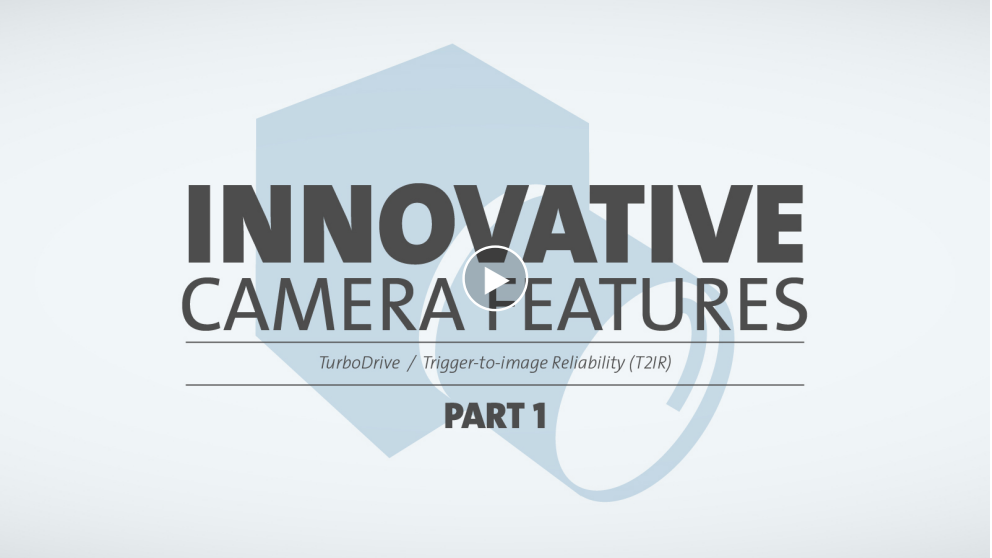
1GigE has a maximum transfer rate of 115 MB/s, which was sufficient for the older CMOS and CCD sensors. **The latest CMOS sensors from ON Semiconductor and Sony have incredibly high resolution and are also very fast.** More and more applications require image data with 10 or more bit depth and colour imaging, which triples the data produced.

Therefore, data rates have increased to 595 MB/s, 1100 MB/s and even beyond. In parallel, thanks to the rapidly advancing network technology, the NBASE-T technology has moved into the vision market. **Cameras with 5GigE Vision, 10GigE Vision or even 25GigE Vision interfaces are now available.**

For any demanding requirements in vision applications, we focus on the Teledyne DALSA Genie Nano-5GigE with the 5GigE Vision interface.

That’s interesting. So why focus on Teledyne DALSA Genie Nano-5GigE?

The **Genie Nano 5GigE** has the unique advantage of providing transfer rates close to 10GigE cameras when combined with **TurboDrive technology from Teledyne DALSA**. 10GigE cameras also get a little hotter and are larger in size. **The combination of 5GigE and TurboDrive enables similar performance rates to 10GigE systems at up to 90m cable lengths.** For instance, images taken with the Genie Nano-5G 8100 with a 45-megapixel ON Semiconductor XGS sensor can transfer up to 19.3 fps, all without having to upgrade the existing Ethernet infrastructure.



You mentioned TurboDrive. Tell me more about this and other software used with the Genie Nano 5GigE cameras?

TurboDrive, is a mode of operation from Teledyne DALSA that was developed to push the Gigabit Ethernet speed ceiling of typically 595 MB/s up to 985 MB/s. **It allows a GigE Vision camera to send pixel information at rates in excess of 150% of GigE bandwidth, speeding up line and frame rates beyond the nominal link capacity.** All whilst retaining the benefits of GigE networks – like the use of inexpensive mass-market components and protocols.

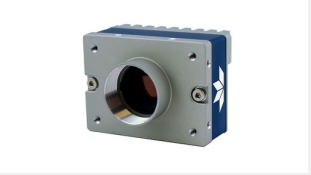
In addition, **STEMMER IMAGING supports TurboDrive also within CVB CameraSuite** which is bundled as a free license with our GigE Vision and USB3 Vision compliant cameras. CameraSuite allows interactive parameterisation and setup of the cameras using the GenICam features in combination with fast and reliable image acquisition from the cameras.

Finally, what value add does STEMMER IMAGING offer when it comes to 5GigE cameras?

The evolution of sensor, camera and network technology shows that there are clear advantages when using compatible technologies. At STEMMER IMAGING, we ensure that all cameras are fully tested to ensure optimal sensor performance. We also check that the network interface cards work reliably and are compatible with the required speed and infrastructure. In simple terms, **we make sure that customers have the right camera and set-up for the job, and**

thoroughly test everything to ensure all products work together correctly. As an example, we could set up an inspection network with multiple cameras that connect to a single workstation. Alternatively, we could have multiple workstations that are all able to monitor the same set of cameras.

Whatever your setup, we have it covered.



The **Genie Nano 5GigE camera from Teledyne DALSA** was released earlier this year and offers nearly all the advantages of a 10GigE camera, but without the price tag and need for a radical overhaul to your existing infrastructure. When used with TurboDrive technology from Teledyne DALSA, it is possible to capture and transmit data at up to 1000 MB/s over existing Ethernet networks, as well as proving power to your camera. That's 10GigE performance from a 5GigE camera

Here at STEMMER IMAGING we provide fully configured and tested camera solutions that are optimised for use with your existing set-up. As leading international machine vision provider, we ensure that our customers get the best possible advice and solutions for vision.

Read more

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