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New Prosilica SDK, GigE Viewer and Firmware Released

Prosilica released the latest version of its GigE Viewer and Software Development Kit (SDK) on 7th April.

GigE Viewer and SDK (v1.20)

The GigE Sample Viewer is a software that allows users to operate Prosilica cameras and explore their features right out of the box whereas the SDK allows programmers to set and control all functions of the image capturing process including image mode, image format, acquisition control, feature control, IO control and much more. The SDK also includes sample code to help programmers quickly and easily integrate Prosilica cameras into their applications using C++ and other programming languages such as .NET, Visual Basic 6 and Java.

The Prosilica SDK supports a wide range of operating systems: Windows (XP, XP x64, Vista, Vista 64-bit, and 2000), Mac OS, Linux and QNX operating systems on both Intel x86, Power PC and ARM9 platforms.

New features

The new version of the SDK comes with a number of updates and features that offer further options for Java and Linux users.

These include:

- Registers read and write API calls added to .NET and Java wrappers
- Existing support for ARM (LE) processor merged into the Linux SDK

For a full list of features, please refer to the GigE SDK 1.20 release notes:

<http://www.prosilica.com/support/gige/090407/Prosilica%20GigE%20SDK%20release%20notes.pdf>

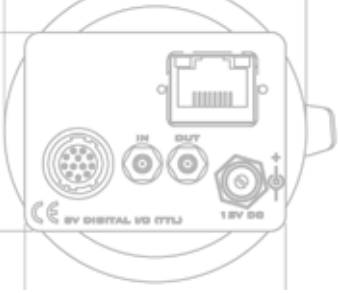
Firmware (v1.36)

Version 1.36 of the Prosilica firmware featuring the *autogain* function was also released. Gain is an amplification of the image signal, similar to the contrast control on a television set. This function is very useful when a short exposure is required (say, to reduce motion blur) because gain can increase the image signal without lengthening exposure

duration. Prosilica provides very flexible auto-gain, auto-iris and auto-exposure features that work together seamlessly to optimize image performance in variable light environments.

It is recommended that users update to the latest versions of the GigE Viewer, SDK and Firmware. Those are available free of charge from the Prosilica web site: <http://www.prosilica.com/support.html>





GE4000 Observes Gamma-Ray Phenomena

The scientific team of the Sternberg Astronomical Institute of Moscow State University supported by the Moscow-based company "Optics" is conducting a project aimed at detecting and measuring optical transients (also called optical bursts). Optical transients are sudden appearances of emissions in a night sky. Their origins vary but those more commonly studied by contemporary astrophysicists are related to optical

emissions from Gamma-Ray Bursts (GRB), powerful explosions that occur at the very edge of the Universe.

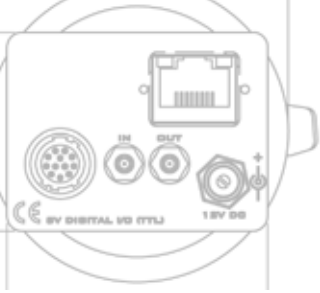
The project has three main objectives: the detection limit of Gamma-ray events, the search for an optical trace of such events, and investigating whether some optical transients are connected with Gamma ray bursts or not.

Optical transients detection methods
Astronomers use two methods to detect these bursts: The first, a direction center of a space Gamma ray observatory (such as the Scott or Fermi observatories) sends a signal along with coordinates to other observatories via the internet as soon as a burst is detected. Telescopes that receive the signal then point towards the specified direction. The process

The two Prosilica GE4000 cameras inside the compact equatorial mount.



Case Study



takes at least ten seconds. Those first missed seconds are believed to be the most important in term of observation as the GRB phenomenon is at its brightest. The second method uses highly sensitive cameras with a wide field of view covering hundreds or thousands of degrees of a sky area and enhances the chances of directly detecting a GRB from start to finish.

The Sternberg Institute's system

Several camera systems are operating throughout the world. Astronomers at the Moscow State University based their system around a CCD camera as they felt that conventional astronomy cameras were not suitable for this application

due to their long read-out and exposure time, which would lower the detection probability by a factor of two or three.

The Sternberg Institute chose the 11-Megapixel Prosilica GE4000 with a GigE Vision™ compliant interface. The GE4000 features the high-quality Kodak KAI-11002 CCD image sensor that provides the high resolution and high sensitivity required to detect the faintest stellar magnitude of optical transients.

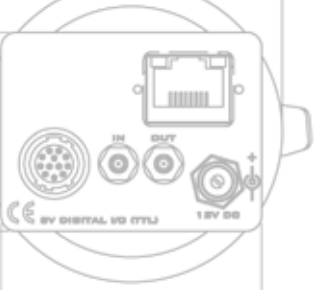
The Sternberg Institute's system consists of a custom made compact equatorial mount allowing fast pointing to the desired sky region and star tracking synchronous with diurnal sky rotation.

Two GE4000 cameras are set-up inside the mount. Each is fitted with a fast f/1.4 50mm prime Nikkor lens for optimal image capture in low-light conditions. The optical axes of the cameras on the same mount are diverged by 13 degrees along the sky parallel to avoid overlapping. The total sky coverage of the system is 2,000 square degrees.

The mount with cameras is installed in a fully robotized enclosure powered by a 24V DC motor. The camera mount and enclosure are operated by a computer located within the enclosure and linked to the observatory LAN. It is powered by custom made controllers connected to the computer via an RS485 connection.



Picture of the night sky taken simultaneously by the GE4000 cameras



A scheduler program activates the system at night when the observatory IR cloud sensor reports clear skies. Each camera is connected to its own image processing computer by a 25m Gigabit Ethernet cable. These computers are primarily used for image processing. Image acquisition is synchronized by the scheduler program.

A total of three systems were set-up by the Sternberg Institute: two near Kislovodsk in the Northern Caucasus at the Pulkovo observatory, site of the new 2.5 meter aperture telescope, and one in Irkutsk, Siberia. The latter was chosen for its 5 hour time difference with Moscow (hence earlier night fall).

Technical issues

The success of the faint signal detection is driven by the signal to noise ratio of the CCD. The Sternberg Institute used an astronomical method to quantify the noise characteristics of the GE4000. The difference between two subsequent frames taken on a uniformly illuminated CCD depends on the total signal amount that provides both the analog-to-digital conversion factor and the readout noise. The Institute determined the readout noise to be very low.

Another issue to be taken into account is hot pixels. It is essential for hot pixels not to be mixed with stellar images in the detection software. After running several tests, the Sternberg Institute came to the conclusion that the position of hot pixels across the CCD and their strength is sufficiently stable to produce a map which is then used for masking the images before source detection.

The system is required to work in sub-zero temperatures. Both GE4000 cameras performed well in -20°C temperatures producing enough heat in continuous shooting mode to sustain all functions.

The system in practice

Once a Gamma Ray burst is detected, the system is pointed to the specific sky area and continuous image acquisition is started. Exposure is set to 5 seconds to optimize the detection of the bursts, and five to nine thousand frames per observation-night are captured by each camera.

The camera-dedicated computers acquire and store the images, make the object detection and measurements, convert their coordinates and send a list of all

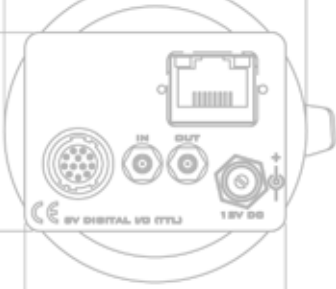
detected objects to the central server. The latter then analyzes the data using particular coincidence criteria, stellar databases and various catalogs to reveal the probable nature of detected events.

The image processing and scheduling software is written in C++ using the Prosilica SDK.

» For further information

Prosilica GE4000

<http://www.prosilica.com/products/ge4000.html>



GE1910: 2 Megapixel HD Resolution GigE Camera

The Prosilica GE-Series of Gigabit Ethernet cameras for machine vision offer 28 high performance models ranging from VGA to 16 Megapixel resolution and with frame rates up to 200 fps at full resolution*.

New generation of high definition sensors

The Prosilica GE1910 features the Kodak KAI-02150, a new generation of 2/3" optical format progressive scan CCD sensors that bring High Definition resolution to the industrial imaging market. The 2/3" sensor is compatible with a very wide range of C-mount lenses.

Advances

The GE1910 improves upon the GE1900 in several ways by offering 40% greater quantum efficiency, very low smear, low noise and superior image quality.

The GE1910 runs up to 32 frames per second at full 1920 x 1080 resolution and is ideally suited for applications such as industrial inspection, machine vision, LCD panel inspection, medical imaging, ophthalmology, aeronautical and aerospace, public security, surveillance, traffic imaging, and OEM applications.

The camera is available in color or monochrome models.

» For further information

GE1910

<http://www.prosilica.com/products/ge1910.html>

Request a quotation

<http://www.prosilica.com/sales/rfq.html>

GE1910 Features

- 2/3" format - HD resolution (1920x1080)
- Kodak KAI-02150 Progressive scan CCD
- Global shutter (Snapshot shutter)
- Fast frame rate - 30 fps at full-resolution
- GigE Vision compliant
- Long cables up to 100 m on network cabling
- Advanced binning modes
- Asynchronous external trigger and sync I/O
- 32 MB resend buffer
- Screw-captivated power connection



*up to 200 frames per second at full resolution and even faster using Area of Interest Readout (ROI)

Published by:

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concentrated performance

GC-Series: Ultra-compact GigE Vision™ cameras

Our cameras are designed and manufactured in-house to deliver a more robust and integrated product that meets the highest quality standards. Our products are noted for their high performance, ultra-compact size, light weight, fast frame rates, wide range of resolution, advanced triggering, sophisticated controls, industrial ruggedness, rich set of camera features and extreme versatility.

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