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GC780: New Low-Cost GigE Camera Runs 64 fps

Prosilica is pleased to announce the addition of a new low cost 1/2" SVGA GigE camera to our popular GC-Series range of ultra-compact machine vision cameras.

1/2" ICX415 CCD sensor, 64 fps

The GC780 features the 1/2" Sony ICX415 progressive scan CCD sensor and runs 64 frames per second at full resolution (782x582). The ICX415 features low dark current, high sensitivity, low smear and excellent anti-blooming characteristics. The GC780 is well suited for applications such as high-speed inspection, machine vision, optical character recognition, traffic imaging, robotics, and OEM applications.

The GC780 has a C-mount with adjustable back-focus and is available in monochrome and color models.

Advanced camera features

Like all Prosilica cameras, the GC780 incorporates a rich set of advanced camera features including snapshot/

global shutter, pixel binning, area of interest readout, video-type auto-iris support, external trigger and sync I/O, RS-232 peripheral port, exposure, gain and offset controls, non-volatile configuration memory, event recorder capability, pre-trigger recording, programmable strobe functions, multicasting, configurable IP addresses, autoexposure, autogain and autowhite balance controls.



Plug-and-play GigE interface

Thanks to its GigE Vision™ compliant interface, the GC780 is plug-and-play and does not require a frame-grabber to operate. The GigE interface also allows cable lengths of up to 100m (300ft) long using conventional Ethernet cabling

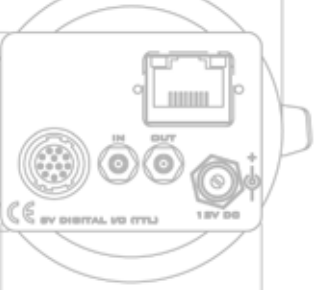
(Cat5e) and even longer lengths using fiber optic cables.

Prosilica software & third-party compatibility

The Prosilica GigE sample viewer and the customer-acclaimed SDK are both available free of charge. The SDK supports Windows, MAC OS, Linux and QNX operating systems on both Intel, Power PC and ARM9 platforms. For users that prefer third-party imaging libraries and applications, Prosilica's GigE Vision cameras are plug-and-play compatible with software from Matrox, National Instruments, Cognex, Stemmer Imaging, Tordivel, Norpix, MVTec, A&B Software and others.

» **For further information, please visit**

<http://www.prosilica.com/products/gc780.html>



Here Comes the Sun



Aerial view of the eSolar demonstration solar plant in California

Solar power plant uses GigE cameras for mirror alignment

Based in Pasadena, California, eSolar is one of the half dozen startups currently building Concentrated Solar Power (CSP) plants in the Southern California desert. The company has developed a proprietary solution that has attracted the attention of investors such as Oak Partners, Google.org and Idealab.

eSolar develops CSP power plants based on mass-manufactured and low-cost components designed for rapid construction, modularity and unlimited scalability in order to provide affordable solar energy. An important component of the eSolar solution is its small-sized heliostats. Heliostats are mirrors which are continuously oriented to reflect sunlight into the aperture of a thermal

receiver mounted atop a tower. Such concentrated light is used to boil the water within the receiver into steam. The steam is aggregated to a turbine and powers a generator. Steam is then cooled back to liquid (water) form and the process repeats.

The need for machine vision

Where other solar thermal power plants use a relatively small number of expensive and large curved mirrors to reflect the sunlight, eSolar uses thousands of small flat mirrors. Measuring only a few square feet in area - as opposed to mirrors that are hundreds of square feet commonly used in the industry - eSolar heliostats arrive pre-assembled with the wiring and sun-tracking motors built-in. Mirror fields are installed low to the ground for a fast and cost-effective installation. By

utilizing a sophisticated tracking system mirrors continuously focus sunlight to the receiver. The tracking system is able to compensate for the manufacturing and installation tolerances for each heliostat in the field. A key ingredient of the system is image processing based on a set of cameras installed around the field. By allowing heliostat tolerances to be corrected via the tracking system, eSolar achieves lower overall costs by cutting down on manufacturing and reducing the individual alignment of mirrors.

System set-up

The cameras used in the eSolar application are the ultra-compact 752x480 monochrome Prosilica GC750. The GigE Vision™ compliant GC750 features a 1/3 progressive scan CMOS sensor that offers high-performance and resistance to blooming.

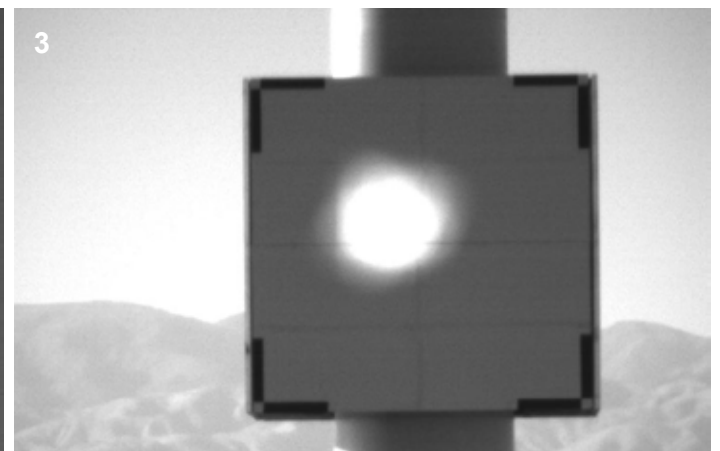
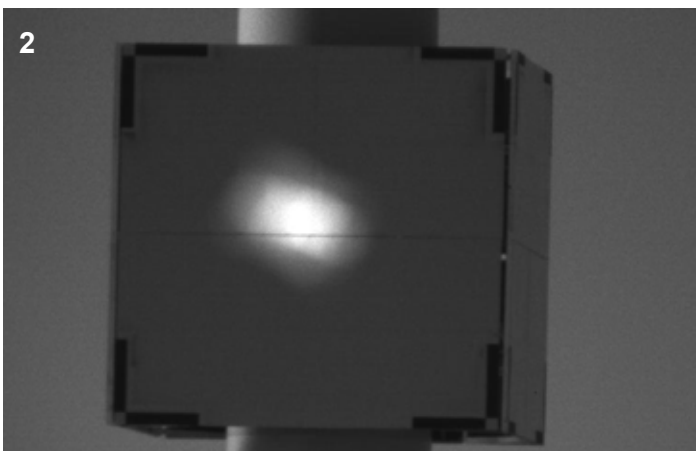
Case Study

eSolar's 5 MW commercial demonstration facility in Southern California uses eight cameras distributed around the field's perimeter and mounted atop individual towers. The plant consists of two adjacent modules featuring a total of 24,360 heliostats. Each module is divided into two 175x95m (576' x 312') sub-fields

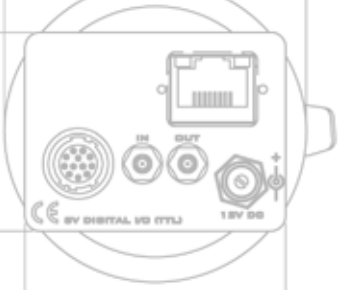
of 6,090 mirrors each that reflect the light onto a central thermal receiver located between the sub-fields.

Each camera is fitted with an Edmund Optics 58-440 varifocal 20-100mm lens, with a fixed focus and zoom set during the installation. The cameras are set

inside ventilated/heated Pelco enclosures with a sunshield for heat management, and are mounted atop 27m (90') towers located at the fields' corners. Each camera points to one of the four 5x5m (17x17') white painted steel targets where light from the mirrors is projected. The targets are located approximately 150m



1. The Prosilica GC750 fitted with the Edmunds Optics lens in an early set-up, 2. Reflection of a perfectly aligned mirror on the center of the target. 3. Reflection of a mis-aligned mirror. (Shots 2 and 3 were taken by the Prosilica GC750 monochrome camera).



(500') away from the cameras and are mounted 36m (120') above ground on the central thermal receiver tower in each field.

The four cameras in the first field connect to a GigE switch linked to fiber optic cabling that goes 200m (650') around the plant to another GigE switch connected to the four cameras in the adjacent field. An additional 300m (1,000') of fiber optic cable links the installation to the control room. The image data received is then stored before being transferred to a laboratory located 90km (56 miles) away via high speed internet connection for analysis.

How it works

Mirrors are programmed to track and focus the sun to the center of a target. Random mirrors within all four subfields are sampled throughout the day. Individual frames are taken at 30 second intervals as various mirrors slew on the target. All imaging is software controlled. Once the system receives confirmation that a mirror is pointing at the target, an image is taken. Hardware and sensor triggers are not necessary in the process.

When an image is received, its background is automatically removed to show the image of the mirror reflection. The basic analysis is a centroid of the reflected sunlight compared to the center of the target. A perfectly aligned mirror will consistently reflect sunlight to the center of the target throughout the day. When a divergence is spotted, eSolar engineers update the proprietary sun-tracking algorithms to correct the mirror alignment.



The eSolar demonstration solar plant in California showing all 24,360 heliostats, the two central thermal receivers with targets, and the towers mounted with the Prosilica cameras.

Camera functions controlled by software include triggering, exposure, and gain. All of these are set to provide the best image of the reflected sun. The application software was developed by eSolar's engineering team using the Prosilica SDK for Windows. The programming was done using C#, C++ and Microsoft Visual Studio tools.

Looking forward

Currently operating a 5 MW commercial demonstration facility, eSolar is

developing and building a project pipeline of over 1 GW of solar thermal power plants across the Southwestern United States and globally.

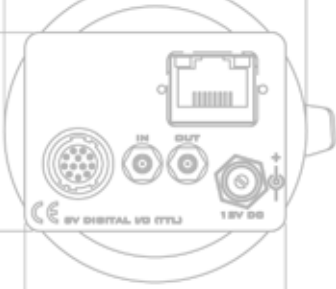
» For further information

Prosilica GC750

<http://www.prosilica.com/products/gc750.html>

eSolar

<http://www.esolar.com/>



Achieving High Resolution Performance

Selecting the right optics for your digital imaging system, as well as paying particular attention to factors such as focus and aperture settings, is essential to achieve high resolution performance.

Here are a few simple rules to follow to get the best image quality results out of your Prosilica camera.

1. Resolving Power

The resolving power of a lens is usually quoted in line pairs per millimeter (lp/mm). Inexpensive machine vision lenses usually offer an optical resolution of around 50 lp/mm, which corresponds to a horizontal pixel resolution of about 700 pixels. These lenses are adequate for use with a VGA resolution camera but will not achieve megapixel resolution.

Some good machine vision lenses have a resolving power of 100 lp/mm which corresponds to a horizontal pixel resolution of 1280 pixels (for 1/2" format). These lenses will achieve up to megapixel resolution.

Higher resolution optics are also available for high resolution cameras such as the Prosilica GC2450 (5 Megapixels), GE4000 (11 Megapixels) and GE4900 (16 Megapixels).

If resolution is important to you, you will need to ensure that your lens resolution is capable of achieving at least the resolution of the camera that you are using.

2. Focus Setting

A slight mis-adjustment of the focus setting will greatly reduce the effective resolution of your imaging system. It is generally recommended to use lenses with screw-lock mechanism on the focus adjustment and take special care in setting the focus of the camera.

3. Aperture

A number of issues surrounding the aperture setting of your lens may affect system resolution. Generally speaking, the wider the aperture, the greater the resolving power but the smaller the depth of field. Conversely, the smaller the aperture setting, the larger the depth of field, but the lower the resolving power of the lens. However, when the lens aperture is opened fully, there are usually lens aberrations that negatively affect resolution. Generally the best resolution performance of a lens is near the full-open setting, but not fully open.

» **For further information, please contact support@prosilica.com**

High Resolution: How High is Too High?

Several issues need to be taken into account when designing a high resolution imaging system:

Data bandwidth:

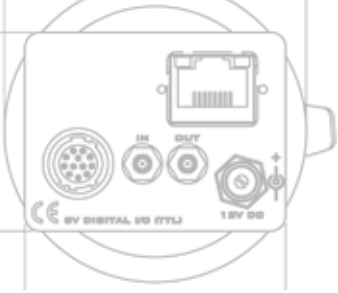
High resolution, high frame rates produce huge data streams. Fortunately, at 125 MB/s Prosilica cameras have the fastest GigE interface on the market.

Computing power:

High resolution images at high frame rates may require significant processing power. Prosilica's driver and optimizations minimize camera-related processing.



GE-Series camera fitted with a lens with screw-lock mechanism



The Vision Show

Phoenix, AZ

Booth 309

March 31 - April 2, 2009

Prosilica will be exhibiting its range of GigE Vision compliant cameras alongside sister company Allied Vision Technologies Inc. at this year's Vision Show in Phoenix, Arizona.

The Vision Show is North America's leading showcase of machine vision and imaging components and solutions. This year's edition will also feature a conference.

» **For further information**

<http://www.machinevisiononline.org/public/calendar/details.cfm?id=64>



Your connection to global machine vision and imaging technologies

New VeriLook Surveillance SDK

Neurotechnology, a provider of high precision biometric identification technologies has announced the launch of VeriLook Surveillance SDK, their latest software development kit for biometric face identification. The company reports that their SDK works with a range of high resolution digital cameras including Prosilica GigE cameras.

The VeriLook Surveillance SDK can detect faces in motion, match them with watch-list databases and report results

in real time. It can be used in security systems in airports, retail stores, on the street, or in other locations where passers-by may not be looking directly into the camera.

» **For further information, please visit**

<http://www.neurotechnology.com>

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GiGE™
VISION

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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