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The Prosilica Advantage

Prosilica introduced the very first GigE Vision compliant digital cameras to the market in 2005. Prosilica's range of GigE cameras now counts over 70 monochrome and color models. Our three series of GigE Vision cameras, the high performance GE-Series, the ultra-compact and fast GC-Series, and the credit-card sized, single-board GB-Series for OEM applications offer a wide range of options to match every customer's needs.

Prosilica's Know-How

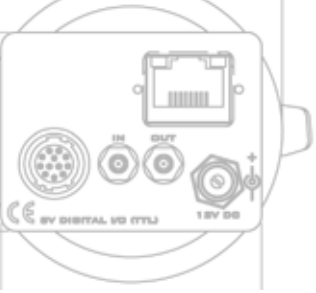
All aspects of Prosilica cameras are designed and manufactured in-house (from firmware to hardware and drivers) to deliver a more robust and integrated product that meets the highest quality standards. Our cameras are noted for their high performance, ultra-compact size, light weight, fast frame rates, wide range of resolution (from VGA to 16 megapixel), advanced triggering,



sophisticated controls, industrial ruggedness, and extreme versatility. They feature the latest progressive scan CCD and CMOS sensors for high image quality. Capable of streaming image data at a sustained 125MB/s transfer rate, the Prosilica Gigabit Ethernet interface is the fastest in the industry - 25% faster than our nearest competitor.

Rich set of camera features

Prosilica cameras incorporate an advanced set of camera features that include snapshot/global shutter, pixel binning, area of interest readout, external trigger and sync I/O, RS-232 peripheral port, exposure, and gain controls, non-volatile configuration memory, event recorder capability, pre-trigger recording,



programmable strobe functions, multicasting, configurable IP addresses, auto-iris, auto-exposure and auto-white balance controls and more.

Applications

Prosilica digital cameras are ideal for a wide array of machine vision applications including industrial inspection, medical imaging, ophthalmology, traffic imaging, aeronautical and aerospace, traffic monitoring, license plate reading (ANPR), public security, intelligent transportation systems (ITS), optical character recognition, biometrics, robotics, surveillance, 3-D metrology, microscopy, fluorescence, LCD panel inspection, aerial photography and OEM applications.

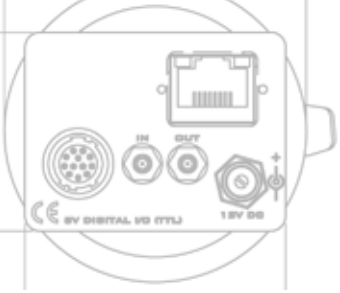
Ease of integration and third-party compatibility

All of Prosilica's Gigabit Ethernet cameras are compliant to the AIA GigE Vision™ standard having the highest degree of plug-and-play usability and low integration costs. The interface also allows cable lengths of up to 100m (300ft) long using conventional Cat5e Ethernet cabling.

The Prosilica GigE sample viewer and the customer-acclaimed Software Development Kit (SDK) are both available free of charge. Our SDK supports Windows (2000, XP and Vista), Linux and QNX operating systems on both Intel and Power PC platforms. Prosilica GigE Vision cameras are also plug-and-

play compatible with third party imaging libraries and applications from Matrox, National Instruments, Stemmer Imaging, Norpix, MVTec, and others.

» **For further information on our products, please visit the Prosilica web site: www.prosilica.com**



Prosilica Cameras Capture the Thrill of Roller Coaster Rides

Based in Montréal, Québec, 3db Solution Inc. designs and sells customized photography systems including green screen photo systems, wireless roving photo systems and ride photo systems, to amusement parks, malls and tourist attractions in North America and Europe.

Since the creation of the initial product, the team at 3db Solution has experimented with various technologies such as video and FireWire cameras before turning to Prosilica and its GigE Vision compliant digital cameras in 2008.



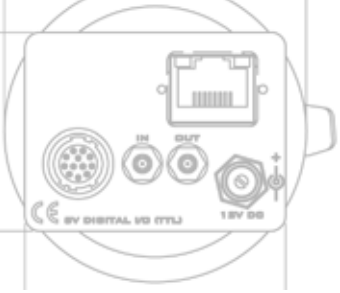
GC1600C and GE1650C

3db Solution has recently equipped three roller coaster rides with products featuring Prosilica cameras at this summer's Playland in Vancouver, BC, Canada. 3db Solution systems use two different Prosilica cameras: the ultra-compact GC1600C, and the high performance GE1650C for rides which require faster frame rates due to higher train speed. Both models are 2 megapixel CCD cameras that provide excellent image quality and run 15 frames per second at full resolution for the GC1600C, and 30 frames per second for the GE1650C. These two cameras were chosen for their small size, fast frame rates, image quality, ease of use and installation, reliability and fast image transfer via their Gigabit Ethernet interface.



Coaster Ride (above) and Flume Ride (left) at Playland, Vancouver BC.

Photos taken with the Prosilica GC1600C



How it works

The Prosilica camera is set inside a housing with a flash lamp (see photo 1) and links to a control box and sensor which trigger the camera as soon as the vehicle appears in the designated field of view. The system is fixed onto a mast overlooking the bottom of the main ride drop for maximum photographic impact. The image data is instantly transferred via fiber optics cable to action photo servers located inside sales point kiosks 175m away for immediate display and processing (see photo 2).

The Prosilica camera is configured to image at 8 photos per half-second and up to 5,000 images can be captured in one single day. During daytime, the camera is set to auto-exposure to adapt automatically to all lighting situations, while at night time shutter speed is set to 1/1,000s. Due to the travelling speed of the train (65-90 km/h), the flash is used at all times to ensure sharp image quality.

» For more information

3db solution

<http://www.3dbsolution.com>

Prosilica GC1600C

<http://www.prosilica.com/products/gc1600.html>

Prosilica GE1650C

<http://www.prosilica.com/products/ge1650.html>

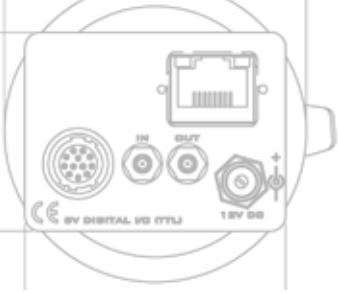


1. Prosilica camera mounted on a mast alongside control box.

Coaster Ride at Vancouver Playland.

2. Photo kiosk at Vancouver Playland





Camera Control Feature: StreamBytesPerSecond

Prosilica GigE cameras come with a wide range of integrated features, some of which, are specific to our products.

The StreamBytesPerSecond control is used to regulate the amount of bandwidth used by a camera. This command is particularly useful for slowing the camera down so that it can operate over slower links such as Fast Ethernet (100-speed), wireless networks or when running multiple cameras on a single Gigabit Ethernet port (sometimes via a switch).

Prosilica's GigE interface is capable of a sustained data transfer rate of 125MB/s and is built to support data transmission to full capacity. However, even slow cameras having, for example, an average throughput of 60MB/s, may have momentary bursts up to 125MB/s. Thus, in multiple camera systems, it is necessary to regulate the 'burst' rate so that cameras do not interfere with each other.

In multiple camera systems, StreamBytesPerSecond for each camera needs to be set to a value so that the sum of each cameras' StreamBytesPerSecond parameter does not exceed the data rate of the GigE port (see *Calculating bandwidth usage*). Setting StreamBytesPerSecond in this way will ensure that multiple camera situations work without data loss.

The StreamBytesPerSecond control parameter can be found in the camera controls of the Sample Viewer, or can be controlled programmatically using the Prosilica SDK.

» **For further information on how to use this command in multiple camera situations, please visit:**
http://www.prosilica.com/support/gige/multiple_cameras.html

Calculating bandwidth usage

Bandwidth usage = Resolution x pixel format x framerate x number of cameras
 = value in MBps (Mega bytes per second)

Example 1

GE4000 using Mono16 and outputting 5 fps
 Bandwidth usage =
 $4008 \times 2672 \times 2$ (2 byte for mono16) $\times 5 \times 1$
 Bandwidth used: ~107 MBps (86%)

Example 2

GC1380C using RGB24 and outputting 20 fps
 Bandwidth usage =
 $1360 \times 1024 \times 3$ (3 bytes for RGB24) $\times 20 \times 1$
 Bandwidth used: ~ 83.6 MBps (67%)

Example 3

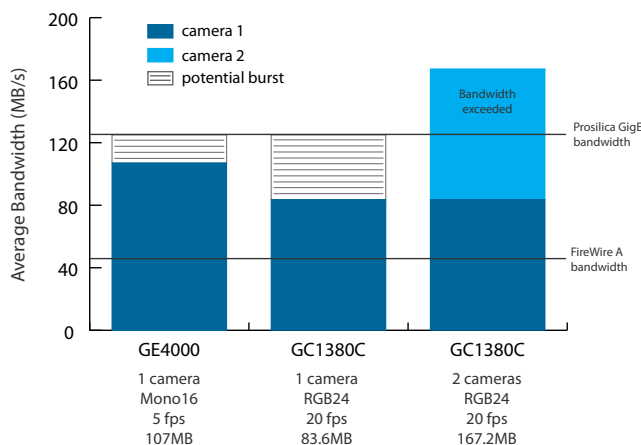
Two* GC1380C using RGB24 and outputting 20 fps and connected to a single switch/single port on system
 Bandwidth usage =
 $1360 \times 1024 \times 3$ (3 bytes for RGB24) $\times 20 \times 2$ (2 cameras)
 Bandwidth used: ~ 167.2 MBps (133%)

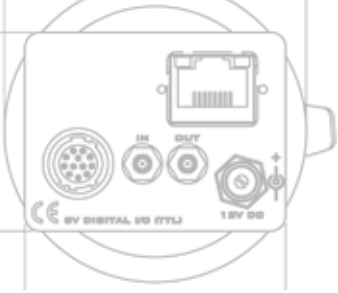
The bandwidth consumption in example 3 exceeds system bandwidth (125MB/s) and will cause the packets to collide when arriving at the PC. Users will need to reduce the framerate and allocated StreamBytesPerSecond. Alternatively more ethernet ports can be added to increase bandwidth.

Pixel Formats

Pixel Format	Bits per pixel
Mono 8	8
Mono 16	16
Bayer 8	8
Bayer 16	16
RGB24	24
RGB48	48
YUV444	24
YUV422	16
YUV411	12

Bandwidth Examples





Vision 2008, Stuttgart

Hall 4, Booth D33 (4-6th November)

Vision 2008, to be held in Stuttgart from November 4-6th, is the world's premier event for the machine vision industry and is expected to attract over 6,000 visitors.

Prosilica will be exhibiting its range of GigE Vision compliant digital cameras alongside parent company Allied Vision technologies, market leader in the area of digital FireWire industrial cameras.

» **For further information on how to attend please visit:**
<http://cms.messe-stuttgart.de>



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less is more



GiGE[™]
VISION

The World's smallest GigE cameras

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