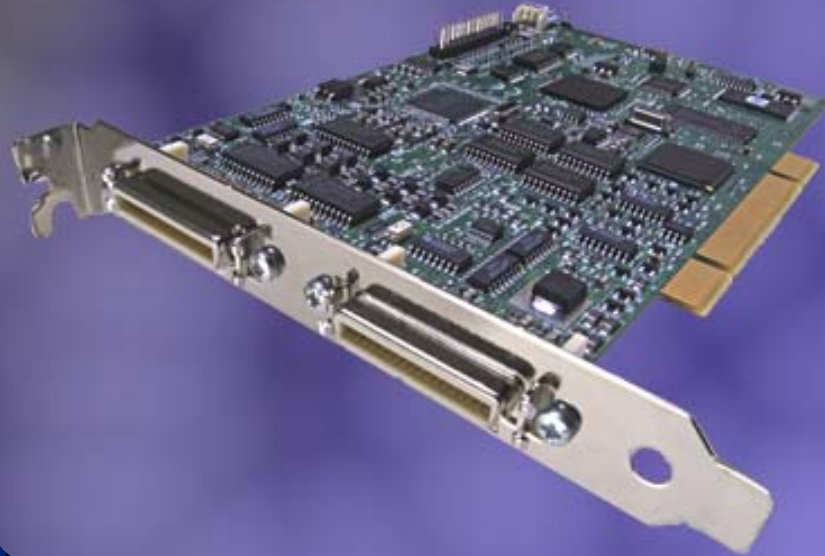


PC2 Vision Express™

A PCI Express Analog Frame Grabber



KEY FEATURES

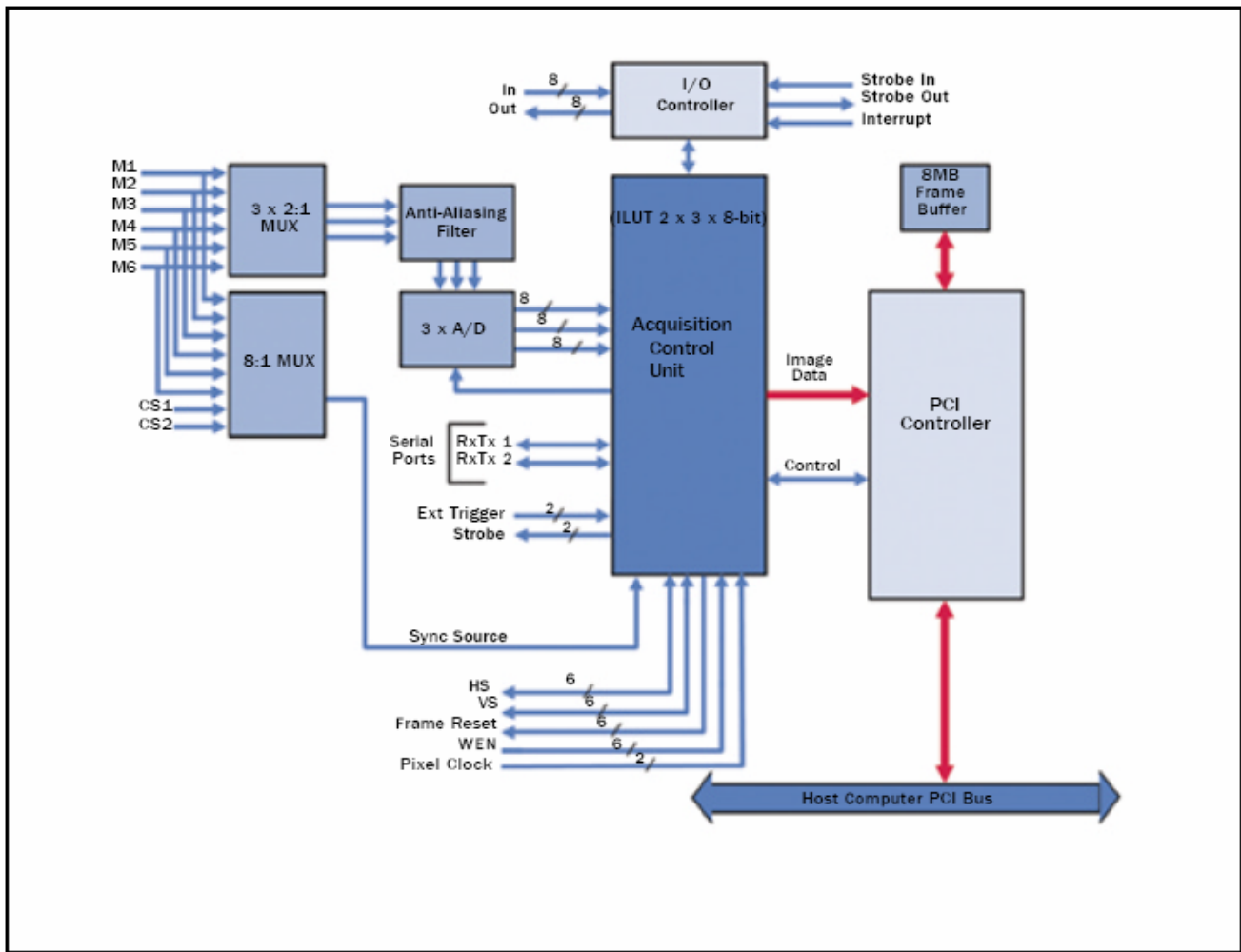
- Trigger to Image Reliability
- Versatile camera input capability
- Flexible Camera Interface
- High Performance Acquisition

OVERVIEW

32-bit PCI frame grabber for machine vision

The PC2-Vision is a high performance, PCI image capture board developed for cost sensitive machine vision applications. The board's acquisition circuitry is exceptionally versatile and designed to interface with standard (RS-170 and CCI-R), nonstandard (progressive scan), RGB and dual channel analog cameras. The PC2-Vision simplifies camera interfacing by offering fully programmable timing coupled with efficient cabling and a variety of trigger, strobe and asynchronous reset options. It features six inputs and high digitization rates making it an ideal solution for a large variety of industrial inspection, identification and gauging applications. The board's outstanding feature is trigger-to-image reliability, which provides the highest degree of assurance in image acquisition control.

The DALSA logo, consisting of the word "DALSA" in a bold, black, sans-serif font. The letter "A" is stylized with a blue horizontal bar extending to the right, creating a dynamic, forward-pointing shape.



PC2-Vision Functional Block Diagram

Acquisition

The PC2-Vision acquires from standard and nonstandard monochrome and RGB analog sources. Its A/D converter can digitize up to three synchronized monochrome cameras. Alternatively, simultaneous acquisition is supported through a frame delay mode feature allowing concurrent capture from all six inputs to increase camera interface flexibility. The PC2-Vision features anti-aliasing filters with cutoff frequency of 6MHz or 12MHz that are software selectable and a filter bypass option. A high accuracy 40MHz triple channel 8-bit analog to digital converter offers gain and offset control to precisely match the video voltage level of the camera.

Acquisition Control Unit

The Acquisition Control Unit (ACU) is a core technology on the PC2-Vision that manages the synchronization of all camera functions, including camera-timing controls. Each of the six camera inputs has its own VS, HS, frame reset and WEN signals. This offers remarkable flexibility in the way cameras can be interfaced to the PC2-Vision. The ACU is able to generate timing information to cameras through those signals enabling the frame grabber to become the timing reference ('master') of the vision system. This feature is useful as it allows cameras to easily genlock together. In addition, a robust sync extractor permits recovery of signals from the most difficult synchronization sources.

Host Transfers

Transfers to host are performed via the PCI bus. The PC2-Vision is 5V and 3.3V PCI compliant, supporting the widest range of PCI bus personal computers. The PC2-Vision's hardware scatter-gather engine requires minimal CPU involvement as it automatically retrieves each descriptor (from host memory) representing the non-contiguous host buffer. The board allows transfers to host memory or to display. Direct transfers of monochrome images to a YUV overlay for display are supported in hardware by adding neutral chrominance to the pixel data. This minimizes the amount of DirectDraw® work the CPU has to perform. When acquiring from RGB sources, the PC2-Vision allows the transfer of 32-bit packed RGB data into a single host buffer or each color plane into its own host buffer. This planar mode of operation is also used with genlocked cameras to associate a different host buffer to each camera. The combination of packed and planar transfers gives maximum flexibility to easily implement image processing functionality in machine vision systems.

Parallel I/O Controller

The Parallel I/O controller offers a convenient way to interface the PC2-Vision to other controllers within the machine vision system. It features eight input, eight output, strobe input and output signals (to latch 8-bit data into onboard registers) and a dedicated interrupt pin with programmable polarity. The parallel I/O also provides two dedicated +5V power pins with protection fuse (500mA).

Software Support

All PC2-Vision applications are created using DALSA's Imaging Foundation Class (IFC). This powerful library allows optimal control of frame grabber resources and greatly simplifies the software development process. To shorten set-up time, IFC includes the Camera Configurator®, a Windows point-and-click utility for the set-up of all camera and interface board parameters. The PC2-Vision provides deterministic responses to interrupts by using DALSA's Virtual Interrupt extension (VIXN) software. Users are guaranteed precise control of interrupts which is a necessary requirement of most all-industrial machine vision applications. The PC2-Vision also supports DALSA's MVTools®, Sherlock™ and WiT™ software packages. For developers requiring maximum flexibility, DALSA's software development tools allow users to develop applications with C DLLs, C++ classes, Microsoft® Visual C/C++® 6.0 (or higher) or Visual Basic® 6.0 (or higher) development

Specifications*

Board Acquisition	<p>PCI - Half-slot rev. 2.1 compliant for 5V and 3.3V slots</p> <p>Supports up to 6 monochrome or 2 RGB analog cameras</p> <p>Supports dual-channel cameras</p> <p>Simultaneous acquisition from up to 3 synchronous monochrome or 1 RGB camera</p> <p>Standard RS-170 and CCIR formats and nonstandard formats</p> <p>Acquisition from interfaced and progressive scan cameras</p> <p>Brightness and contrast control</p> <p>Partial scan mode</p> <p>Frame delay mode</p> <p>40MHz digitization rate, 8-bit</p> <p>Anti-aliasing filters: 6MHz, 12MHz or bypass (software selectable)</p> <p>DC restoration: programmable clamp pulse</p> <p>Composite video 75 ohms terminated</p>
Noise and Pixel Jitter Synchronization	<p>+/- 1 LSB with +/- 1ns jitter</p> <p>Supports composite video, composite sync., separate sync. and sync. on R, G or B inputs</p> <p>Supports master mode where the PC2-Vision sends VS/HS to camera</p> <p>Supports asynchronous reset with pulses up to 60s in duration</p> <p>Each camera has its own vertical sync., horizontal sync., frame reset and WEN signals</p> <p>Two pixel clock inputs</p>
Controls	<p>Two opto-coupled trigger inputs with debouncing (TTL or RS-422)</p> <p>Two strobe signals</p>
Processing	<p>Six 8-bit in/8-bit out input LUT</p> <p>Cropper to define region of interest</p> <p>Horizontal and vertical decimation by 2, 4 or 8</p> <p>Monochrome to YUV converter</p>
Onboard Memory	8MB
Pixel Format	8-bit monochrome, 32-bit RGB (zero-padded), 16-bit YUV with neutral chrominance
Image Size	Up to 2048 x 2048 in monochrome or 1024 x 1024 in RGB
PCI Transfer	<p>Up to 100MB/s sustained</p> <p>Packed and planar transfers</p>
Connectors	<p>Two MDR-36</p> <p>Each camera can be supplied with +12V @ 500mA (from PC power supply, soft-fused)</p> <p>One 26-pin header for parallel I/O port</p>
I/O	<p>RS-232 serial port available on each MDR-36 connector, mapped as a regular Windows COM port</p> <p>19 general-purpose I/O pins, TTL level (8 input, 8 output, 2 strobes, 1 interrupt) with 2 soft-fused +5V power pins @ 500mA</p>
Software	<p>Supported by IFC, MVTools®, Sherlock™, WIT™, VixN</p> <p>Microsoft Winsows NT 4.0®, Windows 2000® and Windows XP® compatible</p> <p>Application development using Microsoft® Visual C/C++® DLLs or Visual Basic®</p>
System Requirements	Intel® Pentium® II class CPU, 64MB system memory, 10MB free hard-drive space
Dimensions	6.675" length x 4.2" height (standard PCI half-slot card)
Power Consumption	+5V: 3A, +12V: 120mA, -12V: 120mA
Temperature	<p>Operating: 0°C (32°F) to +70°C (131°F)</p> <p>Storage: -40°C (-40°F) to +125°C (257°F)</p>
Relative Humidity	5% up to 95% (non-condensing)
Markings	<p>FCC class B - Approved</p> <p>CE - Approved</p>

Notes:

¹ Contact DALSA Montreal Sales for more information

* Last updated February 2007

