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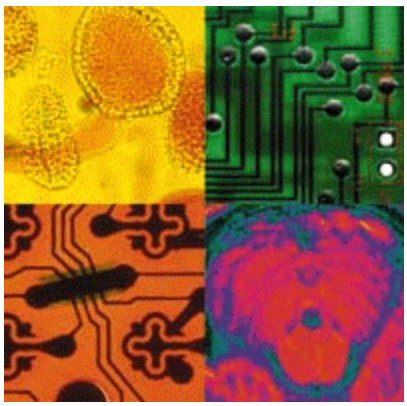
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Matrox *Pulsar*

Flexible monochrome PCI frame grabber
with real-time transfer to system memory and
integrated display

Matrox Pulsar

The Matrox Pulsar flexible PCI frame grabber delivers the best price/ performance in the industry

MATROX PULSAR

Key Features

- captures from standard and non-standard cameras in 8 or 10-bits
- grabs from frame scan and line scan devices
- interfaces to cameras from: Dalsa, Kodak, Pulnix, Sony and more!
- real-time transfers to system RAM or on-board display
- PCI bus master interface
- up to 16-bit TTL/RS-422 digital data input
- on-board high performance graphics for integrated display up to 1600 x 1200 resolution
- non-destructive overlay
- 4 MB of on-board WRAM
- 4 software selectable input channels
- programmable acquisition synchronization and control
- external trigger input (TTL/RS-422)
- exposure (timer) outputs (TTL/RS-422)
- software programmable input gain, offset, and references
- comes with a 'C' development library for acquisition, display, and transfer control
- supports Windows NT, Windows 95, Windows 3.1x, and 32-bit DOS extenders
- supports Microsoft Visual C/C++, Borland C/C++, Watcom C/C++ and Microsoft Visual Basic
- compatible with Microsoft Foundation Classes (SDI and MDI)

Applications

- Machine Vision
- Image Analysis

- Medical Visualization
- Robotics
- Inspection and Process Control
- Microscopy
- Biomedical Analysis
- and more

Matrox Pulsar

Matrox Pulsar offers all the right features for your standard/non-standard monochrome acquisition needs, as well as provides outstanding on-board display capabilities. Whether you develop machine vision, image analysis, or medical imaging applications, you'll find Matrox Pulsar fits your requirements:

- acquisition and display on one board for a single slot solution
- triggered acquisition allows interface to asynchronously resetable cameras
- high-rate capture meets the demands of high-speed inspection systems
- real-time transfer to host memory provides immediate access of images by the host
- 10-bit digitization enables accurate capture of low-contrast images
- high resolution capture handles large fields of view with fine detail
- support for line scan cameras meets the requirements of specialized inspection applications
- non-destructive overlay gives you the power to annotate images

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Matrox Pulsar-LC

Matrox Pulsar-LC is a lower cost version of Matrox Pulsar, with all the same powerful acquisition features, but without the on-board integrated display section. This makes the board suitable for applications where display is not necessary, such as automated inspection tasks that do not require operator intervention. Using Matrox Pulsar-LC also offers the flexibility to work with a separate display board.

Exploit Advanced PC Technology

The Matrox Pulsar was designed with your demanding applications in mind. It allows you to take advantage of today's technological advances such as higher resolution analog and digital cameras, powerful processors, the PCI bus, and 32-bit software environments.

Acquisition

Standard/Non-standard Monochrome Acquisition

The Matrox Pulsar delivers flexible monochrome analog or digital video acquisition. It grabs from RS-170/CCIR cameras and from non-standard video sources such as high resolution frame scan cameras. It supports capture from non-standard devices at up to 1K x 1K x 8 bits per pixel at 30 frames per second or the equivalent.

For applications requiring more than 256 gray levels, the Matrox Pulsar has 10-bit analog to digital conversion providing 1024 gray levels. Sampling is up to 30 MHz with 10-bit grayscale resolution or up to 45 MHz with 8-bit.

Up to 4 analog software selectable input channels are available for interfacing to multiple cameras. The on-board PLL generates a variable scan clock with a programmable frequency from 5-45 MHz, and provides phase adjustments from -180° to 90° in 90° increments.

For digital acquisition, the Matrox Pulsar comes standard with a 16-bit TTL data interface. An optional input module is required for 16-bit RS-422 data. Digital data can be clocked at up to 30 MHz.

Video Adjustment

Software programmable gain allows conditioning of the video input signal so that the complete dynamic range of the 10-bit A/D converter can be used. For more specialized applications requiring a finer adjustment of the video input, black level and reference controls are available on the A/D converter.

The programmable lookup table (LUT) can transform the digitized 10-bit or 12-bit pixel data to 8-bit pixels for transfer to the display section or can be used to manipulate the incoming 8-bit, 10-bit or 12-bit video stream. Matrox Pulsar supports horizontal and vertical subsampling by 2 and 4.

Synchronization and Control

The Matrox Pulsar can be programmed to accept or generate video timing signals such as horizontal sync, vertical sync, and pixel clock in TTL/RS-422 format.

External Trigger

An external TTL/RS-422 trigger input can reset the acquisition hardware synchronously or asynchronously to give the user complete control over image capture.

Exposure Control

An exposure (or timer) output is available in TTL/RS-422 to remotely control camera exposure settings.

Transfers

Transfer Rate

The Matrox Pulsar is capable of sustaining transfer rates of up to 60 MB/sec between the acquisition section and the host PCI system (depending on the host computer used).

PCI Bus Master

The Matrox Pulsar acts as a PCI bus master allowing transfers without requiring continuous host intervention.

Display

(Not available on Matrox Pulsar-LC)

Resolutions Up To 1600 x 1200 @ 85 Hz

The Matrox Pulsar's integrated display section delivers real-time display of captured video. Various resolutions up to 1600 x 1200 are supported at up to 85 Hz refresh rate.

This display section is powered by award winning Matrox MGA graphics accelerator technology and can be used as the host system's main display controller, eliminating the need for a separate display board.[2] The display section incorporates the Matrox MGA 2064W 64-bit chip, a 220 MHz RAMDAC, and dual-ported WRAM; guaranteeing lightening fast display performance, high resolution, and a ultra high refresh rate. The latest generation MGA 2064W chip offers the best graphics performance in the industry.

Dual Frame Buffer Architecture

The integrated display section comes with a 2 MB WRAM image frame buffer (8-bit monochrome) and a separate 2 MB WRAM overlay frame buffer (8-bit pseudo color). WRAM, the latest in display memory technology, is up to 50% faster than VRAM.

Non-Destructive Overlay

The overlay frame buffer enables non-destructive overlay of text and graphics onto the contents of the image frame buffer.

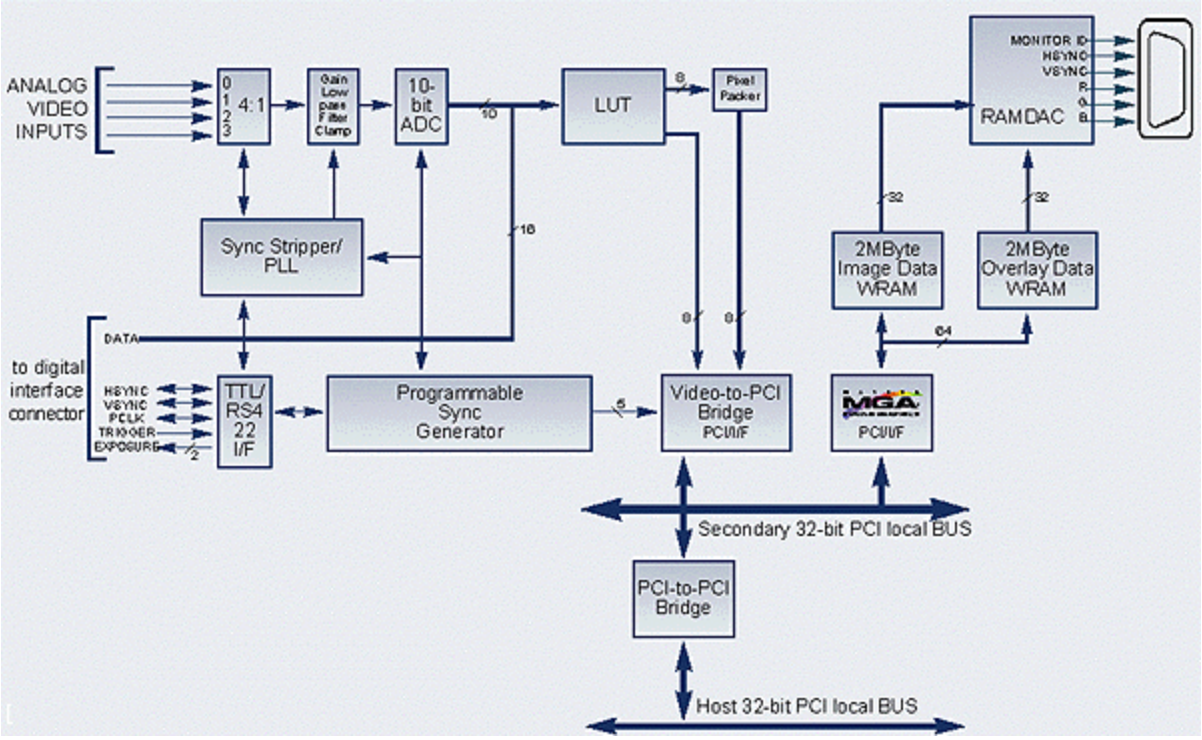
Dual-Screen Mode

In this set-up, Matrox Pulsar can capture and display live video with overlay on one monitor while an additional display (or another Matrox Pulsar) displays the desktop on a second monitor.

Dual-Head Mode

Under Windows NT, using two Matrox Pulsar boards, or a Matrox Pulsar and a Matrox MGA Millennium display board, one large virtual desktop can be created and displayed across two monitors. The live video can be displayed across both screens.

Matrox Pulsar Block Diagram



Software

MIL-Lite Development Library

The Matrox Pulsar supports MIL-Lite, a 'C' development library for acquisition, transfer, and display control. O/S support includes Windows 3. 1 x, Windows 95, Windows NT, and 32-bit DOS extender. Environments supported include Microsoft Visual C/C+ +, Borland C/C+ +, Watcom C/C++, Microsoft Visual Basic, and Microsoft Foundation Classes (MFC).

Camera Interface Support

Matrox lntellicam Camera Configuration Utility

Camera Definition Software

Matrox Intellicam is a simple, easy-to-use utility for interfacing the Matrox Pulsar to cameras. By supplying the general characteristics of the camera, the user can instruct lntellicam to generate a digitizer configuration file. This file can then be used in other Matrox software routines to initialize Matrox Pulsar acquisition hardware.

Matrox Pulsar has been successfully interfaced to popular standard and non-standard cameras. Digitizer configuration files and detailed interface application notes for these cameras are available. To interface to additional cameras, Matrox Intellicam software provides the necessary support.

Matrox Pulsar supports cameras from these manufacturers:

•Dalsa
•Kodak
•Pulnix

•Sony

•and more!

The MIL-Lite library, Matrox Intellicam camera definition software, and various board installation and driver software is ordered as a separate package at no charge.

Matrox Imaging Library (MIL) (sold separatly)

MIL is a high-level 'C' library with commands for image processing, pattern matching, blob analysis, gauging/ measurement and OCR (optional module). MIL is available in either 16 or 32-bit versions (MIL-16 or MIL-32).

Matrox Inspector (sold separatly)

Matrox Inspector is a Windows-based application that provides point-and-click access to a tool-set of the most commonly used functions for image capture, blob analysis, pattern matching, storage, organization, enhancement, analysis and inspection.

Rapid application development

OEMs and integrators use MIL to accelerate the development of machine vision, image analysis and medical imaging applications. With MIL's highly integrated commands, developers use relatively few lines of code for an entire application.

Specifications

Interface

• PCI 32-bit bus master interface
• up to 60 MB/sec transfer rate depending on host computer used
• can generate interrupts towards host computer on grab and synchronization events

Acquisition

• RS-170/CCIR, non-standard analog or digital video input (comes standard with TTL data interface, optional digital input module required for digital data in RS-422 format)
• frame scan or line scan capture
• Pixel Jitter: ± 2ns (when using a stable reference source)
• S/N ratio: 56 dB

Analog interface

• 4 software selectable video inputs
• variable sampling rate: 5-45 MHz
• 10-bit A/D converter
• 45 MHz maximum sampling at 8-bits or 30 MHz at 10-bits
• phase adjustment from -180° to 90° in 90° increments

Digital interface

• on board up to 16-bit TTL input

• optional digital input module provides up to 16-bit TTL/RS-422 at up to 30 MHz

Synchronization and control

• hsync, vsync, pixel clock input or output (TTL/RS-422)
• external trigger input (TTL/RS-422)
• exposure (timer) outputs (RS-422)

Video adjustment

• software programmable input gain, offset, and references
• fully programmable input LUT
• horizontal and vertical sub-sampling by 2 and 4

Display Section

(not available on Matrox Pulsar-LC)

• Matrox MGA 2064W graphics engine running @ 50 MHz
• 2 MB WRAM 8-bits per pixel monochrome image frame buffer
• 2 MB WRAM 8-bits per pixel pseudo color overlay frame buffer
• resolutions up to 1600 x 1200 @ 85 Hz refresh rate
• non-destructive overlay of text and graphics

Connector pinouts

•Video in:

pin A1	analog video input 1
pin A2	analog video input 2
pin 1	TTL trigger input
pin 2	ground
pin 3	ground
pin 4	analog video input 4
pin 5	analog video input 3

•Video out:

(Connector present but not connected on Matrox Pulsar-LC)

pin 1	analog red output
pin 2	analog green output
pin 3	analog blue output
pin 4	monitor ID 2 input
pin 5	ground
pin 6	ground
pin 7	ground
pin 8	ground
pin 9	not connected
pin 10	ground

pin 11	monitor ID 0 input
pin 12	monitor ID 1 input
pin 13	TTL horizontal sync output
pin 14	TTL vertical sync output
pin 15	monitor ID 3 input

Power/Dimensions/Environmental

Matrox Pulsar

5V ±5%, 2.2A; 12V± 5%, 150mA; -12V ± 5%, 40mA; 13.28 W (typical)
31.4 L x 10.7 H cm (12.4" x 4.2") H: bottom edge of goldfinger to top edge of board
34.1 L x 10.7 H cm (13.4" x 4.2") includes retainer

Matrox Pulsar-LC

5V ±5%, 1.1A; 12V± 5%, 120mA; -12V ± 5%, 40mA; 7.42 W (typical)
31.4 L x 10.7 H cm (12.4" x 4.2") H: bottom edge of goldfinger to top edge of board
34.1 L x 10.7 H cm (13.4" x 4.2") includes retainer

Matrox Pulsar/Matrox Pulsar-LC digital input module

5V ±5%, 520mA; 2.6 W (typical)
13.0 L x 8.7 H cm (5.1" x 3.4") H: bottom edge of goldfinger to top edge of board

Matrox Pulsar/Matrox Pulsar-LC and digital input module

Operating Temperature: 0°C to 55°C (32°F to 131°F)

Ordering Information

Part Number	Description
Hardware	
PULSAR	std./ non-std. mono PCI frame grabber with integrated display
PULSAR-LC	std./ non-std. mono PCI frame grabber
PULSAR/DIG/MOD	optional 16-bit digital input module for RS-422 (available Q4 '95)
Software	
Ordered separately at no charge:	
PULSAR/SW (for both Matrox Pulsar & Pulsar-LC)	contains:
	MIL-Lite library (16 & 32-bit), Matrox Intellicam, Pulsar installation disk, MIL drivers, MGA Display drivers

Sold separately:	
INSPECTOR-32	Matrox Inspector (32-bit version)
Analog input cables	
Sold separately	
IMG-7W2-TO-1BNC	input cable, one 7W2 to one BNC
IMG-7W2-TO-5BNC	input cable, one 7W2 to five BNC
Digital input cables	
Sold separately (for synch and control only)	
PLS-TTL-CABLE	input cable, DB-37 female on back plate to flat cable connecting into baseboard
IM-LCDICBL/OPEN	input cable, DB-37 male to open end (requires PLS-TTL-CABLE)
[1] maximum host buffer size is 4 MB (for example 2048 x 2048 x 8) and display buffer size is 2 MB (for example 1600 x 1200 x 8).	
[2] it supports zoom (x2 or x4), panning and scrolling common to both overlay and image buffers.	

For more information, please call: 1-800-804-6243 or 514-969-6020 or email: imaging.info@matrox.com

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