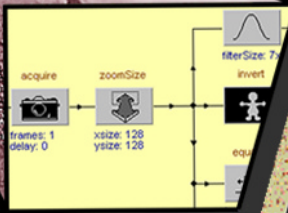
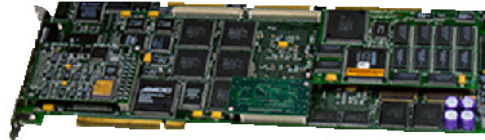
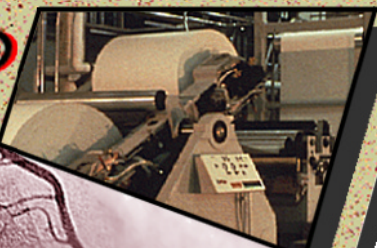




MaxPCI Pipeline Vision Processor

Vision By MaxPCI®



Unmatched Power and Flexibility

- 40MHz processing throughput
- 10,000 MIPs per PCI slot expandable to 42,000
- Up to 224MB memory per slot
- Interface up to four simultaneous cameras per slot
- Full MMX and multi-CPU support with WindowsNT
- 3GB/sec. pipeline bandwidth
- Up to 14x14 convolution @40MHz
- UL, CSA, & CE Mark qualified
- Aggressive OEM volume pricing

A wide selection of **MaxACQ acquisition modules** provide high throughput and simplify integration for analog and digital sensors including area, line-scan, and TDI types, in a range of resolutions.

MaxPCI accommodates up to two specialized **PSMOD daughtercards** for additional processing and storage capabilities. Developers can tune the MaxPCI hardware to meet performance, price, size, and weight require-

ments. When inspecting a fast moving web, a 300mm silicon wafer, a 500 ball BGA part, imaging an amorphous silicon X-ray panel, or working on a similarly demanding imaging application, MaxPCI has the power, accuracy, and flexibility to get the job done. It is ideal where requirements are measured in parts-per-second, rather than per-minute, and axis resolution is in thousands of pixels, not hundreds, or precision is 12-, 16-, or 24-bits, not just 8-bits.

Powerful Pipeline Processing

MaxPCI uses pipeline processing to acquire, store, process, and display images. Image data is piped through a series of high speed computational elements arranged in a certain order to perform specific sets of image processing algorithms or tasks. The elements can be connected together, through the high-bandwidth non-blocking crosspoint switch, in a large number of different pipeline configurations. Multiple pipelines, operating simultaneously in a single MaxPCI, provide the ultimate in processing power and flexibility.

Flexible, Modular Design

The base configuration for MaxPCI occupies one PCI bus slot. It has four image memories (VSIMs), dual arithmetic units (AUs), advanced dual 16x16 look-up tables (LUTs), and a histogram and statistics processor, all built around a powerful non-blocking crosspoint. A fifth snap-in VSIM is optional. Each VSIM memory has its own internal image processing capabilities as well.

ments.

MaxPCI's High Speed Image Access (HSIA), allows high-speed transfers of pipeline data directly to and from the PCI bus, without host CPU intervention. MaxPCI processing reduces a data set to a small region of interest or to statistics which can be transferred over the PCI bus for additional analysis on the host computer, maximizing efficient and economical use of all system processors.

The optional high-resolution **MaxVGA** card allows MaxPCI users to display real-time video in a Windows NT® environment without utilizing the bandwidth provided by the PCI bus.

Datacube Software

Programmers can develop applications quickly and effectively using DatacubeWiT, MaxVision Toolkit, and/or PC ImageFlow software in a Windows NT environment, along with a wide variety of industry-standard programming and productivity tools.

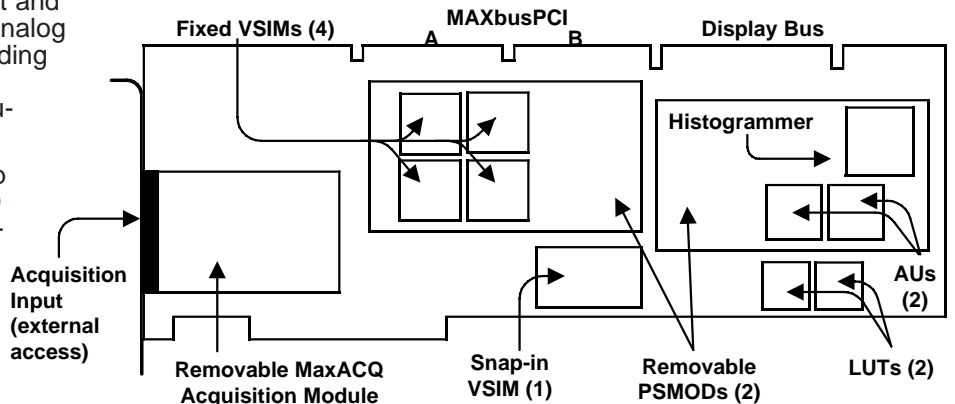
DatacubeWiT is a rapid visual program development tool, which allows you to essentially draw a block diagram of your application and then run it using MaxPCI as an accelerator.

PC ImageFlow is an object-oriented library of C-callable functions that synchronize multiple data transfers at frame rates, hiding the complexities of the hardware from the programmer.

The MaxVision Toolkit provides a system approach to programming common machine vision processes such as metrology, correlation, template matching, and blob analysis.

MaxPCI Industrial Workstations

For application developers who want to "plug and play," Datacube offers a MaxPCI-based industrial PCI workstation including a fully configured MaxPCI board, a powerful industrial



PCI computer system, the Windows NT operating system, with any complement of Datacube's software development tools factory installed and tested. This system allows users to begin development work immediately, without having to first integrate hardware and software from several different vendors.

Hardware

Physical Description

- MaxPCI requires one full ISA-length PCI slot
- Add-on acquisition modules (MaxACQs): 1
- Add-on processing and storage modules (PSMODs): 2
- Optional MaxVGA requires 1 additional full-length slot for optional live, non-PCI bus video display

Memory

Datacube VSIMs are fixed to the board, with ALU, LUTs, and statistics sections. They are not required for display.

- 4x4 MB fixed memory
- An optional fifth snap-in VSIM memory module: 4 or 16 MB

Crosspoint

Datacube 40 MHz crosspoint ASIC

- 65x75x8-bit @ 40 MHz
- 55x57x1-bit @ 40 MHz
- 3 GB/sec. internal bandwidth
- Virtually unlimited timing buses

Data Interconnectivity

- Two sets of four (4) MAXbus/PCI bidirectional 8-bit 40 MB/sec. ports for multi-board connections
- One (1) private display bus to optional MaxVGA (40 MB/sec)
- PCI bus with high-speed random

access to image memories and High Speed Image Access (HSIA)

40 MHz Processing Resources

Two (2) AUs (40 MHz Datacube ASIC)

- 4X processing of MaxVideo 200
- 40 MHz Sobel filter
- 320 million multiplies/sec.
- 560 million logical ALUs
- 3200 total operations/sec.

One (1) histogrammer

- 8- or 10-bit histograms
- ROI output of histogram
- 24-bit row or column sum
- Suitable for Hough or projection
- 1024 bins with 24-bit increment
- 10x24-bit LUT

Two (2) LUTs (16x16 each), four (4) operating modes:

- Look-up table in pipeline
- Image memory with RCV gateway (fast load)
- Image memory with XMT gateway (per pixel gain and offset correction)
- CPU Read and Write from memory

Two (2) large delay lines (for boxcar filters, binary morphology)

- 5K long, 16-bit-wide delay
- 300K long, 8-bit-wide delay

Power Requirements (all voltages are $\pm 5\%$)

- +5 Volts 5.20 A (typical)
- +12 Volts 50 mA (typical)

26.60 Watts total (typical)

Environmental Specifications

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

Maximum Chip Case Temp: 85° C
(185° F)

Storage Temperature: -40° to 212° F
(-40° to 100° C)

Relative Humidity: 10% to 90%
(non-condensing)

Air Flow Requirement: 50 LFPM (min)

Software

- Operating System: Windows NT 4.0
- DatacubeWiT
- PC ImageFlow
- Microsoft Visual C++ 5.0

Acquisition Options

A wide range of analog and digital MaxACQ modules are available.

Optional Processing & Storage

Select up to two PSMODs for additional processing features and power.

Optional Display Capabilities

The MaxVGA card and the Display PSMOD provide display capabilities.

Additional Information

For more information please refer to the following Datacube literature:

[MaxPCI Industrial Workstation Data Sheet](#)

[MaxVGA Data Sheet](#)

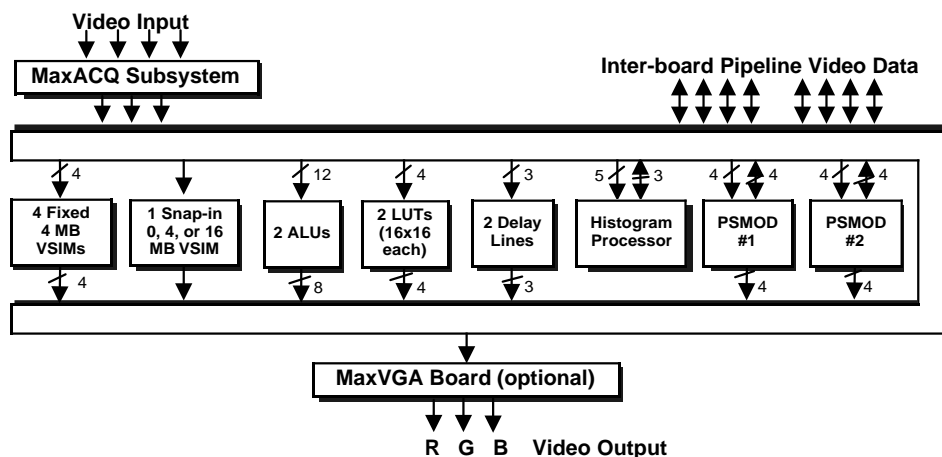
[MaxACQ Data Sheets](#)

[PSMOD Data Sheets](#)

[DatacubeWiT Data Sheet](#)

[PC ImageFlow Data Sheet](#)

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