

# Acuity 2000 Vision Processor

## Product Summary

The Acuity 2000 Vision Processor is a complete high-performance vision system in a single PCI slot. It supports a variety of machine vision cameras and offers on-board accelerated vision processing, I/O, communications, networking, and display.

This 4th-generation vision platform tightly integrates hardware and software and is designed to meet the needs of both OEM and factory floor vision users.



## Vision Acceleration ASIC Delivers High Performance

Key to the board's high performance is an RVSI designed vision processing acceleration

ASIC specifically architected for machine vision. This chip represents the latest generation of Acuity vision processing hardware, shrinking the processing functionality that used to occupy multiple printed circuit boards into a single silicon die.

The ASIC accelerates most low level image processing/analysis operations by approximately 10x-100x over a high performance embedded CPU or up to 10x over an MMX enabled Pentium II host CPU. All full frame image processing/analysis operations may be performed in only a fraction of a frame time allowing multiple operations per frame. Such acceleration makes it possible to use the vision system in high throughput applications and to deploy more intelligent tools for increased robustness at run time and for enhanced ease of use during setup/training.



## Features

- Single slot PCI card
- High performance vision engine off-loads vision tasks from host PC
- ASIC accelerates all vision processing for speed and robustness
- Supports asynchronous inspections per board & multiple boards
- On-board real-time multi-tasking O/S for deterministic response
- Supports a variety of analog & digital cameras
- On-board digital I/O for triggering, strobe control, & other interfacing
- On-board analog outputs for light control
- On-board serial ports
- Built-in networking for seamless integration to factory networks/intranets
- Direct SVGA & host PC image display
- Visionscape™ Windows NT® vision and high-level tool libraries speed up application development & deployment
- Windows® NT support



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## On-Board Processing Completely Off-loads Host PC

The vision engine configuration completely off-loads the host PC CPU & PCI bus from all vision related operations including image acquisition, vision processing, I/O, communications and display allowing the host PC to be dedicated to other tasks. Since the vision board fits inside the host PC, this is truly a zero footprint solution - a key consideration in any OEM application. Multiple boards, each dedicated to different inspections tasks, can be used inside a single host PC - a true multiprocessing configuration.

## Real-time On-Board Operating System Assures Deterministic Operation

The real-time multitasking operating system running on the on-board CPU allows fully deterministic response in all vision-related operations. This is critical in many industrial control applications and has been difficult to achieve in conventional PC based vision systems running on non real-time operating system.

## Interchangeable Camera & I/O Interface Modules for Flexibility

The board design is modular with interchangeable plug-in camera & I/O interface daughtercards:

- CAMI/O 300 analog camera interface supporting four RS-170/CCIR cameras.
- CAMI/O 400 digital camera interface supporting many digital cameras including high resolution, line scan and TDI cameras
- CAMI/O 640 non-standard analog camera interface supporting four independent channels, high or standard resolution, progressive or partial scan, asynchronous reset, shuttered, etc.

In contrast to multimedia or scientific frame grabbers, the CAMI/O modules offer a variety of machine vision features such as integrated trigger/strobe support and fast camera switching, which allows images to be acquired from different channels on successive frames. The CAMI/O 300 board supports both synchronous acquisition on all four channels as well as fully asynchronous acquisition with RVSI cameras. The CAMI/O 640 board supports fully

asynchronous acquisition on four independent channels with a variety of cameras. The onboard real-time multi-tasking O/S allows a variety of pipeline acquisition/processing modes.

## On Board I/O, Communications, & Display

All CAMI/O modules feature extensive on-board I/O capabilities including 4 dedicated triggers, 4 dedicated strobe outputs, 16 user programmable opto-isolated field I/O points, and 8 analog outputs. (Two on-board serial communication ports allow direct connection to other equipment and communications under the control of the on-board CPU and real-time multitasking O/S). The Acuity 2000 vision engine board also features an on-board integrated graphics/video accelerator. This allows separate image display on an optional SVGA monitor directly connected to the vision processor board in addition to the default picture-in-picture image display on host PC Windows display. Both displays allow full graphics overlay for results or other operator feedback.

## Built-in Networking

Most communications between the board and the host PC are implemented over a patented TCP/IP network connection through the PCI bus. This enables use of a wide variety of popular network services (such as Telnet, FTP, NFS, HTTP, etc.) for host/target communications and for accessing a board from other PC's in the network. In addition to simplifying application development and deployment, such network connectivity ensures readiness to transparently participate in manufacturing floor networks/intranets and supports innovative remote monitoring/diagnostics options such as, for example, through a web browser.

## Visionscape™ Software

The Visionscape™ Software for the Acuity family of vision processors encompasses proven complete solutions for many applications and vertical markets as well as intuitive point-and-click graphical environments for vision application development and deployment.

## Host-PC Requirements

Pentium class CPU (200MHz or higher), one open half length PCI slot, Microsoft Windows NT 4.0 operating system.

Specifications subject to change without notice.

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