

Matrox

4Sight

Compact, self-contained platform for cost-sensitive machine vision, medical imaging, and video surveillance applications.



Your Next Imaging System

Matrox 4Sight is a compact, self-contained platform with the core functionality needed to build low-cost machine vision, medical imaging, or video surveillance systems. Image capture, processing, and display, along with networking and general purpose I/Os, are all integrated into a small, cost-effective package. Coupled to this hardware is the field-proven Matrox Imaging Library (MIL), a software development toolkit with an extensive set of image capture, processing, analysis, and display functions.

PC-based technology

Matrox 4Sight features an Intel x86 compatible processor with MMX™ technology and a PCI peripheral bus. Matrox 4Sight leverages PC technology for high-performance, low-cost components while ensuring interoperability by offering a single integrated solution from a single vendor. With Matrox 4Sight, you spend less time integrating individual system components, giving you more time to develop your application. Careful component selection and a firm commitment to long-term supply gives Matrox 4Sight the design stability required by OEMs and integrators alike.

IEEE 1394 ready¹

This next generation high-speed digital serial interface promises to revolutionize the link between electronic devices. Video cameras, printers, and mass storage devices are among the many peripherals that will soon feature an IEEE 1394 interface. The simple standard cabling, peer-to-peer networking capability, plug 'n' play, and hot-plug features of IEEE 1394 will result in lower overall system integration and maintenance costs. Matrox 4Sight opens the door to this revolutionary new technology by including an IEEE 1394 interface.

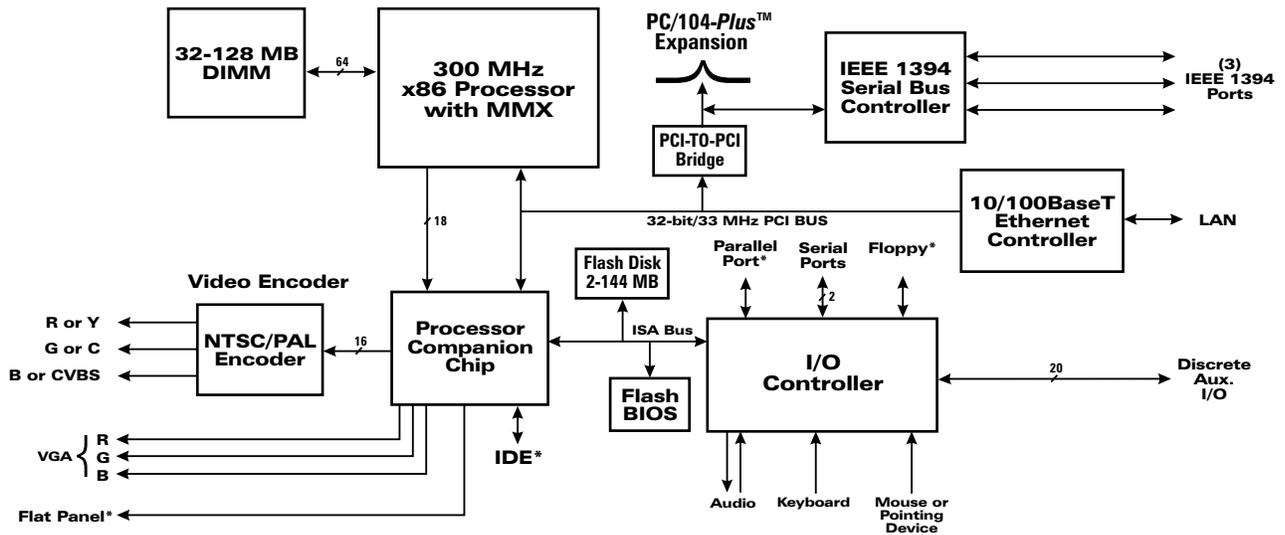
MATROX
4SIGHT

Key Features:

- integrated video capture, processing, and display platform
- small footprint
- standard and non-standard analog video input
- optional mass storage for video archiving
- VGA and TV outputs
- graphics overlay on live video output
- audio input and output
- Ethernet network interface
- IEEE 1394 interface
- RS-232 communication
- discrete digital I/Os
- keyboard and pointing device inputs
- runs Windows® NT Embedded
- also compatible with DOS and standard Windows NT
- programmed using standard Windows-based development tools and Matrox Imaging Library (MIL)



Matrox 4Sight



*Accessible on Motherboard only

Machine vision

Designed for machine vision applications, Matrox 4Sight supports progressive scan video capture and asynchronous reset camera modes. It also includes discrete digital and serial I/Os for interfacing to automation devices such as a PLC or motion control unit. An Ethernet link is provided for connecting to a factory or plant's LAN. VGA display and TV outputs, as well as keyboard and pointing device inputs, are available for implementing a local operator interface.

Medical imaging

Matrox 4Sight is ideal for medical imaging applications such as endoscopy. It offers standard NTSC/PAL and programmable video acquisition, as well as an external trigger input offers precise control over image capture. Matrox 4Sight provides VGA display and TV outputs with live video overlay, as well as support for standard and custom user input devices.

Video surveillance

For video surveillance, Matrox 4Sight offers standard NTSC/PAL video capture with simultaneous connection to multiple video cameras. Discrete digital I/Os interface to alarm and access control devices. An audio input and output is present for connecting an external microphone and speakers.

The VGA display and TV outputs allow local viewing for a security agent. Connect Matrox 4Sight directly to a facility's LAN or telephone network via an external modem or terminal adapter for remote on- or off-site surveillance.

EBX motherboard

At the heart of Matrox 4Sight is an EBX motherboard. EBX is a standard form factor with a small footprint, ideal for deeply embedded applications.

processor

The Matrox 4Sight motherboard features a Cyrix® MediaGX™ x86 compatible processor with Intel MMX™ technology for accelerating audio, graphics, video, and imaging functions. Highly integrated, it incorporates a CPU, memory controller, display controller, and PCI controller on a single chip. The processor runs at 266 MHz with a 64-bit external memory interface operating at 76 MHz. External memory is provided via a single standard 168-pin DIMM slot supporting a 32, 64 or 128 MB SDRAM module. External memory is shared between the CPU and graphics controller.

graphics and audio

The integrated graphics controller is VGA compatible and supports resolutions up to 1280 x 1024 at 8-bits per pixel (pseudo-color) and 1024 x 768 at 16-bits per pixel (hi-color). It can output to a standard VGA monitor and TFT² panel. A separate composite, Y/C or RGB NTSC/PAL output, for a TV monitor or VCR, is provided by a video encoder. Non-destructive graphics overlay onto live video display is supported by the video assist unit in the processor's companion chip. Support for 16-bit stereo audio is also provided by the processor's companion chip.

persistent storage

A 256 KB flash BIOS is present for permanently storing the processor's boot sequence. A DiskOnChip[®] flash disk with a hard drive compatible interface provides mass storage for the operating system, software libraries, and application. Supported capacities range from 2 to 144 MB by way of a 32-pin socket on the motherboard.

networking

The Matrox 4Sight motherboard integrates a standard 10/100BaseT Ethernet interface.

other I/Os

Additional mass storage support is provided by an IDE interface for a hard drive and a floppy drive interface². Two RS-232 serial ports, a parallel port, and PS/2 keyboard and pointing device ports are also included. In addition, 20 discrete TTL compatible³ digital I/Os with hardware interrupt capabilities are present on the motherboard.

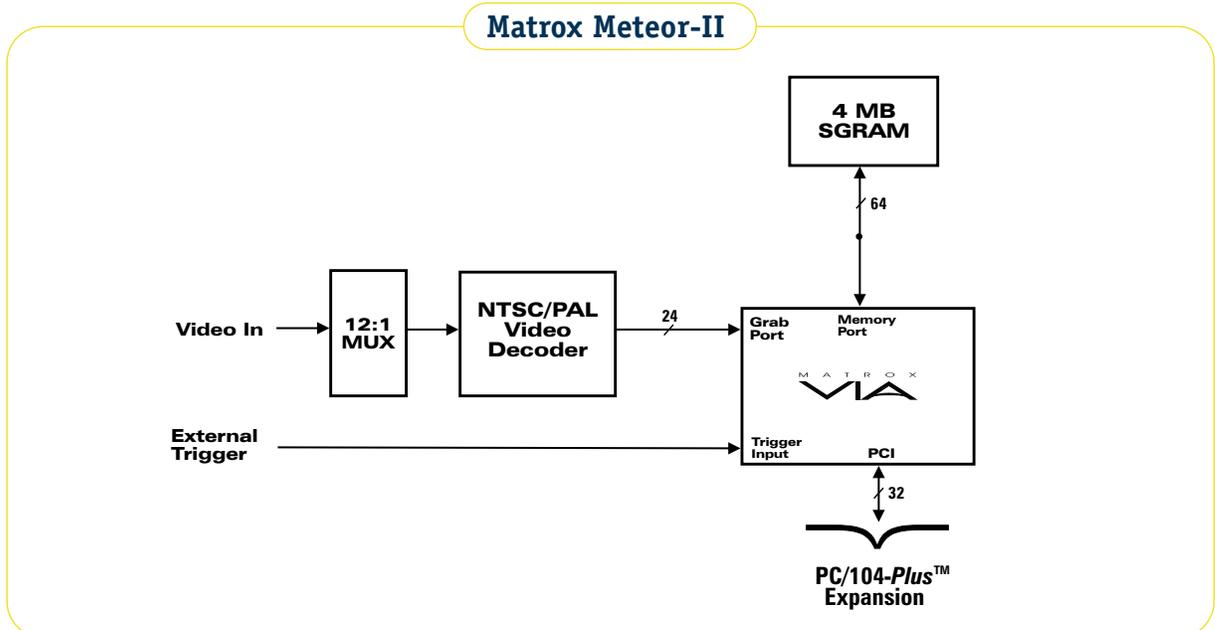
PC/104-Plus™ expansion

PC/104-Plus™ is a standard stackable form factor for the ISA and PCI busses. Rugged and small, it is used on Matrox 4Sight to provide access to Matrox Meteor-II frame grabbers and other third party peripherals such as a motion controller. The motherboard can accept up to three PC/104-Plus™ boards.

Matrox Meteor-II Frame Grabbers

Matrox Meteor-II

Matrox Meteor-II for PC/104-Plus™ is a PCI frame grabber that captures standard analog composite (CVBS) or Y/C NTSC/PAL and composite RS-170/CCIR from video cameras and VCRs. It supports square pixel/CCIR-601 formats and on/off toggling of automatic gain control (AGC). A trigger input is available for synchronizing acquisition to external events in a manner that is synchronous to the video input. Up to 12 CVBS or 6 Y/C video sources can be connected and acquired separately.



Matrox Meteor-II/Multi-Channel

Matrox Meteor-II/Multi-Channel for PC/104-Plus™ is a PCI frame grabber that captures from standard or variable analog monochrome, or component RGB frame scan sources. Matrox Meteor-II/Multi-Channel specifically supports acquisition from interlaced or progressive scan component RGB cameras, and single or two-channel progressive scan monochrome cameras. Also supported is the simultaneous acquisition of up to 3 gen-locked RS-170/CCIR video cameras. Up to 2 RGB or up to 6 monochrome video cameras can be connected and acquired separately.

Sampling rates of up to 30 MHz are supported. Signal conditioning on Matrox Meteor-II/Multi-Channel consists of variable gain amplifiers for handling a variety of input signal levels as well as 10 MHz low-pass filters to eliminate aliasing. Other features of the multi-channel version include adjustable analog-to-digital converter (ADC) references, and three 256 x 8-bit LUTs for remapping the digitized pixel stream(s).

Matrox Meteor-II/Multi-Channel includes separate pixel clock, hsync, and vsync signals. It also provides two timer outputs for controlling exposure, as well as a trigger input for synchronizing acquisition to external events in a manner that is synchronous or asynchronous to the video input. Two auxiliary I/Os are also available for general-purpose use.

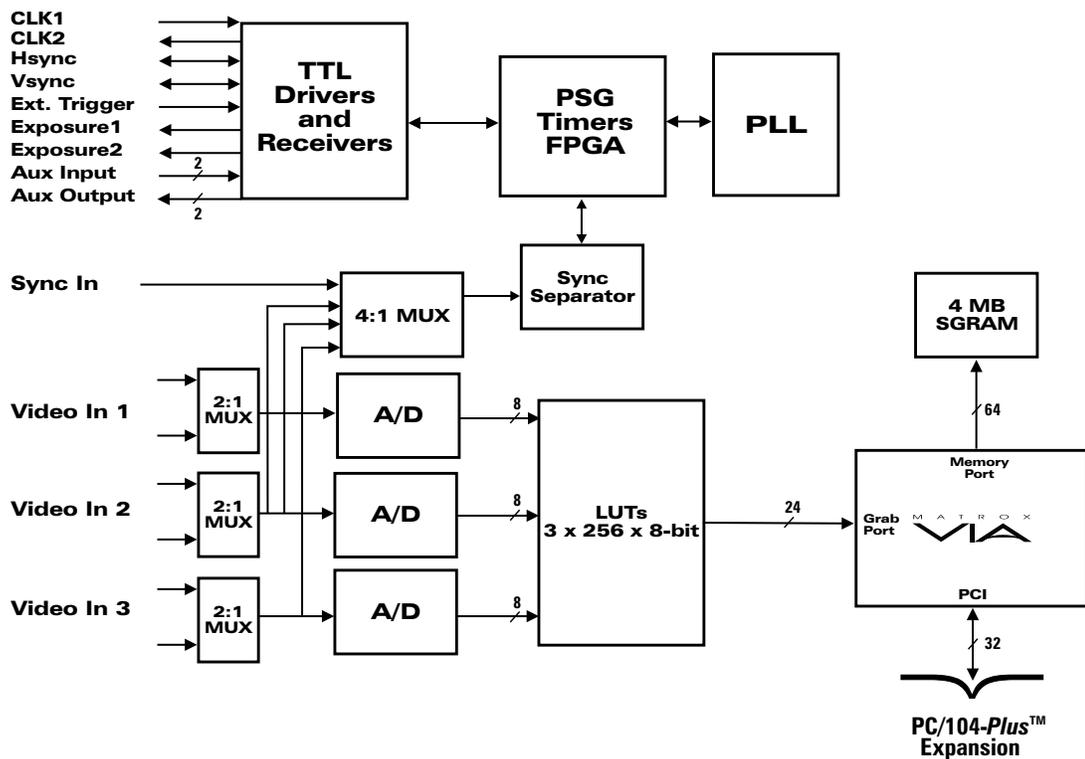
Chassis and power supply

The optional chassis for Matrox 4Sight encloses motherboard, up to three PC/104-Plus™ boards, optional hard drive, and fan. The chassis features a rugged construction with mounting points for securing the unit to other equipment. An external power supply is also included.

Mass storage

Matrox 4Sight is available with an optional hard drive. Designed for notebook PCs, this 2.5" hard drive is both compact and shock resistant. Storage capacity of up to 6 GB is available.

Matrox Meteor-II/Multi-Channel



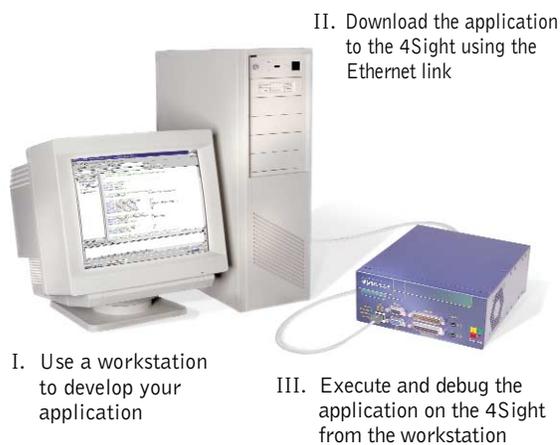
Software Environment

Operating systems

Matrox 4Sight employs Windows® NT Embedded as an operating system. It is also fully compatible with DOS and standard Windows NT.

Windows NT Embedded is a derivative of standard Windows NT. It consists of authoring tools for selectively installing Windows NT components including peripheral drivers, file systems, networking and utilities. With Windows NT Embedded, one can reduce storage requirements to as little as 10 MB. Windows NT Embedded also contains features specifically designed for embedded applications such as headless operation, flash disk storage and remote management. The headless mode of operation allows Matrox 4Sight to be deployed in deeply embedded applications where no local user interface is desired or possible. This additional support enables Windows NT to properly function without a display, keyboard, and pointing device. Since it is based on Windows NT, programming is done using the standard WIN32 API and Microsoft® development tools.

Cross-Platform Development



Matrox Imaging Library⁴

Image capture, processing, analysis, and display are programmed using Matrox Imaging Library (MIL), a field-proven library available for Windows. MIL includes a comprehensive set of optimized functions for image processing, pattern matching, blob analysis, gauging, OCR, matrix/bar code reading, and calibration. MIL has been designed to fully exploit the power of Intel MMX™ technology and offers an intuitive and easy-to-use programming interface. Developers can choose from two programming interfaces: classic 'C' (DLL) and ActiveX (OCX). MIL-Lite, a subset of MIL, is also available for applications that only require image capture, archiving, and display.



Development environment

The development environment for Windows NT Embedded consists of a standard PC linked to Matrox 4Sight. The PC hosts the development tools: IDE (editor, compiler, etc.), MIL/MIL-Lite, remote debugger, and OS configuration utility. An application is created on the host PC in the usual manner using the IDE and MIL/MIL-Lite. Once the application is built, it is downloaded to Matrox 4Sight and debugged remotely from the PC. The OS configuration utility is used to customize the OS for a particular hardware configuration of the Matrox 4Sight.

Usage models

Matrox 4Sight can be configured to operate as a fully autonomous or networked device. In either case, the application can be permanently resident or downloaded on power up. In the autonomous mode, the application executes without any remote interaction. In the networking model, the application executes under the control of a supervisory application running on a remote PC, which communicates through the network link. Matrox 4Sight can also be configured as a web server, making it accessible through a standard Internet/Intranet web browser.

Specifications

Motherboard

- EBX form factor (8" x 5¾" or 20.32cm x 14.61cm)
- Cyrix® MediaGX™ processor @ 266 MHz (x86 compatible with Intel MMX™ technology)
- 168-pin DIMM slot (32, 64 or 128 MB SDRAM)
- VGA output (standard and TFT flat panel²)
- up to 1280 x 1024 @ 8-bpp and 1024 x 768 @ 16-bpp
- supports non-destructive overlay of live video
- separate CVBS, Y/C or RGB NTSC/PAL video output
- 16-bit stereo audio I/O
- 256 KB flash BIOS
- 2-144 MB flash disk
- 10/100 Mbps Ethernet port
- three 400 Mbps IEEE 1394¹ ports
- IDE interface²
- floppy drive interface²
- two RS-232 ports
- parallel port
- PS/2 keyboard and pointing device ports
- 20 discrete TTL compatible I/Os³
- up to three PC/104-Plus™ expansion boards (ISA/PCI)

Matrox Meteor-II (optional)

- PC/104-Plus™ analog frame grabber (PCI)
- CVBS or Y/C NTSC/PAL
- composite RS-170/CCIR
- supports VCRs
- square pixel or CCIR-601 digitization
- controllable AGC (freeze with manual adjust)
- RGB 8:8:8 or YUV 4:2:2 pixel formats
- synchronous trigger input
- connect up to 12 CVBS or 6 Y/C or combination

Matrox Meteor-II/Multi-Channel (optional)

- PC/104-Plus™ analog frame grabber (PCI)
- supports monochrome/RGB, interlaced/progressive, and variable frame scan
- three 8-bit ADCs
- sampling rate up to 30 MHz
- pixel jitter of ± 1.5 ns
- selectable input gain
- 10 MHz low pass filter
- adjustable ADC references
- three 256 x 8-bit programmable LUTs
- separate pclk, hsync, vsync, timer (exposure), and auxiliary I/Os
- synchronous and asynchronous trigger input
- connect 2 RGB or up to 6 monochrome sources

Chassis (optional)

- 0.048" (1.2mm) cold roll steel
- integrated fan rated at 9-12 cfm (0.25-0.34 m³/min.)

Hard drive (optional)

- 2.5", shock resistant
- 6 GB
- mounted inside chassis

Power supply (optional)

- input: 100~240 Vac
- output: 12Vdc, 2.5A (30 W)
- external to chassis

Power consumption

- 1.83A @ 12V or 22W (typical)⁵

Certifications

- UL/CUL TUV, FCC Class A, and CE class A

Software environments

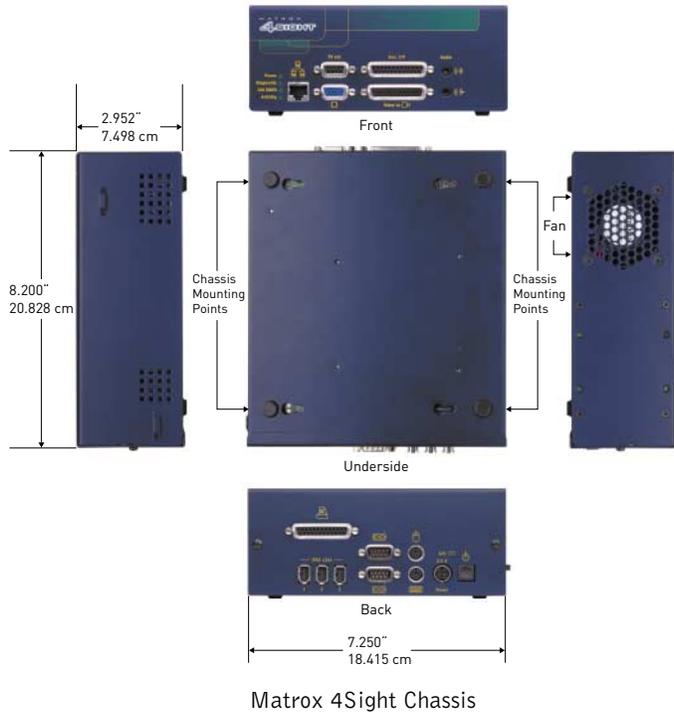
- runs Windows NT Embedded
- also compatible with DOS and standard Windows NT
- cross-platform development environment using standard Windows-based tools

Environmental information

- operating temperature: 0°C to 50°C (32°F to 122°F)
- relative humidity: up to 90% (non-condensing)

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Matrox 4Sight Chassis, Motherboard and Frame Grabber



Matrox 4Sight (EBX) motherboard



Matrox Meteor-II for PC/104-Plus™ (PCI frame grabber)

Ordering Information

Part number

Description

Hardware

FS/S/L/W/S/L/A,E or U 4Sight unit including 64 MB RAM, 48 MB DOC, Window NT Embedded, Meteor-II for PC/104-Plus, 6 GB hard drive and power supply with appropriate power cord.

FS/S/L/W/M/L/A,E or U 4Sight unit including 64 MB RAM, 48 MB DOC, Window NT Embedded, Meteor-II/Multi-Channel for PC/104-Plus, 6 GB hard drive and power supply with appropriate power cord.

Ordered separately:

Software

MIL-LITE/CD

MIL-Lite board control library. (See MIL-Lite brochure for more details).
Matrox Imaging Library (MIL). (See MIL brochure for more details).

MIL-32/CD

Input cables

DBHD44-T0-8BNC (for Meteor-II/MC)

2 m (7') input cable, high density DB-44 to eight BNCs. Includes two SVHS adapters.

DH44-T0-8BNC/0 (for Meteor-II/MC)

0.9 m (3') input cable, high density DB-44 to eight BNCs and open end (to access synch and control signals). Includes two SVHS adapters.

DBHD44-T0-13BNC (exclusively for Meteor-II for PC/104-Plus)

2 m (7') DBHD-44 to thirteen BNCs.

Notes:

1. Also known as FireWire or i.Link™.
2. Only accessible directly on motherboard.
3. LVTTL.
4. Refer to MIL and MIL-Lite brochures for more information.
5. With DiskOnChip, hard drive, Meteor-II/Multi-Channel and MJPEG module.

Contact Matrox Imaging Sales for more information.

For more information, please call: 1-800-804-6243 (toll free in North America) or (514) 822-6020 or e-mail: imaging.info@matrox.com or <http://www.matrox.com/imaging>

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