



Smart cameras

# Matrox Iris P-Series >>

Powerful programmable smart cameras



## Key features

- powerful embedded Intel® architecture processor
- runs Microsoft® Windows® CE .NET real-time operating system
- programmed using familiar Microsoft® development environment and Matrox Imaging Library (MIL)
- web-based configuration and monitoring
- high-fidelity monochrome or color CCD sensors
- externally triggered or internally controlled electronic shutter
- Ethernet network interface
- RS-232 serial communication
- auxiliary digital I/Os
- sturdy industrial design

## Best of both worlds

Matrox Iris P-Series offers the best of both worlds by combining the integration of a conventional smart camera with the flexibility of a traditional PC-based machine vision system. Matrox Iris P-Series is a fully programmable device allowing extensive customization by OEMs and integrators for their individual vertical markets. It features an embedded Intel® architecture processor, which provides the computing power to handle typical machine vision applications. Matrox Iris P-Series uses a real-time operating system to deliver the performance and robustness necessary for mission-critical machine vision applications. Its familiar Windows® programming environment minimizes the learning curve and maximizes development flexibility while the Matrox Imaging Library (MIL) programming toolkit, with a solid 10-year track record, provides the image processing and analysis tools that allow OEMs and integrators to get the job done quickly and with confidence.

## High-fidelity image sensors

Matrox Iris P-Series makes use of interline transfer progressive scan CCD image sensors with square pixels to produce fine, sharp and consistent details vital for accurate and precise image analysis. The family of available sensors include support for sub to megapixel resolutions, higher readout or frame rates, and monochrome or color (by way of a mosaic filter) imaging. The sensors provide an externally triggered electronic full-frame shutter, which enables the capture of rapidly moving objects in crisp images. An FPGA device is present to pre-processes sensor data (e.g., color interpolation) releasing the camera's embedded microprocessor for more advanced image processing and analysis, communication, and control tasks.

## Embedded Intel® architecture processor

Advanced image processing and analysis, communication, and control operations are all performed on Matrox Iris P-Series by the industry proven Intel® Ultra Low Power (ULP) Celeron® processor with Intel® 440MX companion interface bridge. The flash disk and SDRAM memory located within Matrox Iris P-Series provides ample space to store and execute the operating system, MIL and a custom machine vision application.



Preliminary

## Matrox Iris P-Series

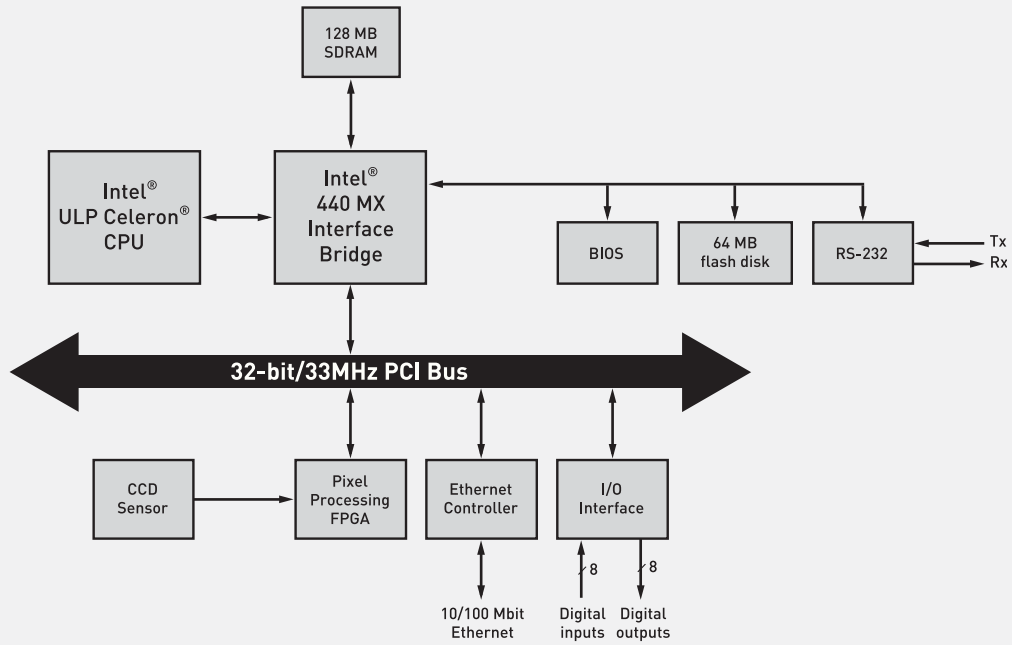


Figure 1

## Cross-platform Development

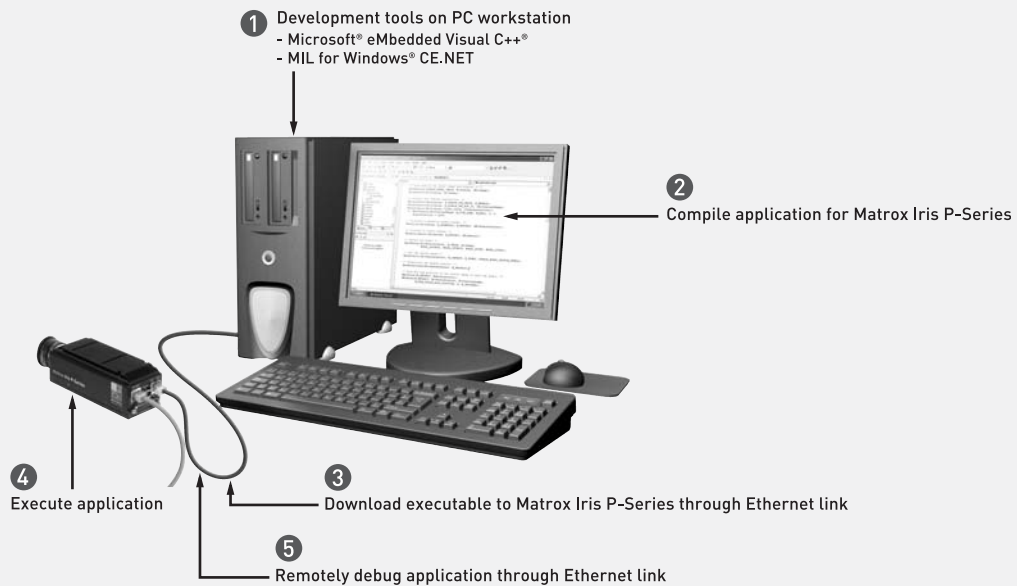


Figure 2

**Communication and I/O**

Matrox Iris P-Series features a 10/100 Mbit Ethernet interface to provide the connectivity to the emerging factory floor networks. A RS-232 serial interface and 16 industrial digital I/Os (8 input and 8 output) enable the direct interaction with other factory automation devices.

**Software Environment**

**Windows® CE .NET and eMbedded Visual C++**

Matrox Iris P-Series comes pre-installed with Microsoft® Windows® CE .NET, a compact real-time operating system. Windows® CE .NET provides hard real-time capabilities (i.e., deterministic response to interrupts and task switches even when the CPU is heavily loaded), fast boot-up and immediate shut-down. Programming under Windows® CE .NET is done using a subset of the Win32® API and consists of a cross-platform environment (see Figure 2). The C/C++ application code is compiled using Microsoft® eMbedded Visual C++® running on a PC. The executable is downloaded to the camera through the Ethernet link, and the program can be debugged remotely from the PC running eMbedded Visual C++® over this same Ethernet link.

**Matrox Imaging Library**

Matrox Imaging Library (MIL) is a high-level programming library with an extensive set of optimized functions for image processing and analysis. Refer to the MIL brochure for more information.

**Usage models**

Matrox Iris P-Series can be configured to operate as a fully autonomous or network 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 network model, the application executes under the control of a supervisory application running on a remote PC, which communicates through the network link. Matrox Iris P-Series can even be configured to operate as a web server.

**Configuration and monitoring**

The configuration and monitoring of Matrox Iris P-Series is performed through resident web pages accessed remotely through Microsoft® Internet Explorer (see Figure 3). This web-based interface allows a user with the appropriate privileges to view status information (e.g., network interface, flash disk/memory usage, temperatures, event logs, etc.) and configure operational parameters (e.g., boot process, network interface, applications to run, firmware revisions, etc.). It also allows an operator to remotely view live video for camera alignment and focusing.

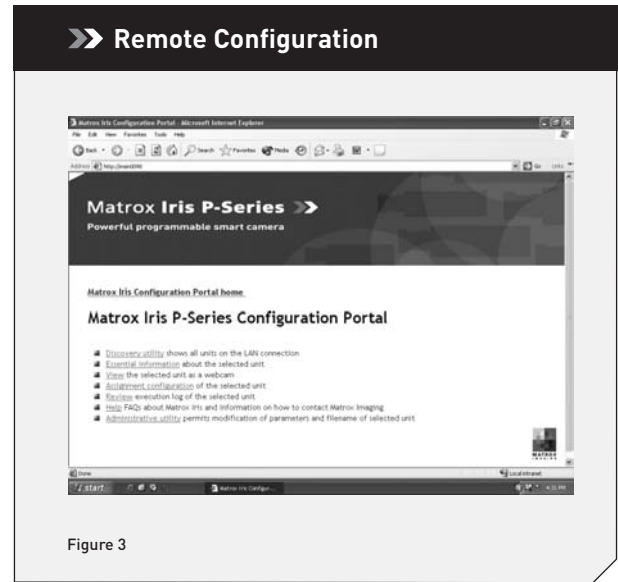


Figure 3

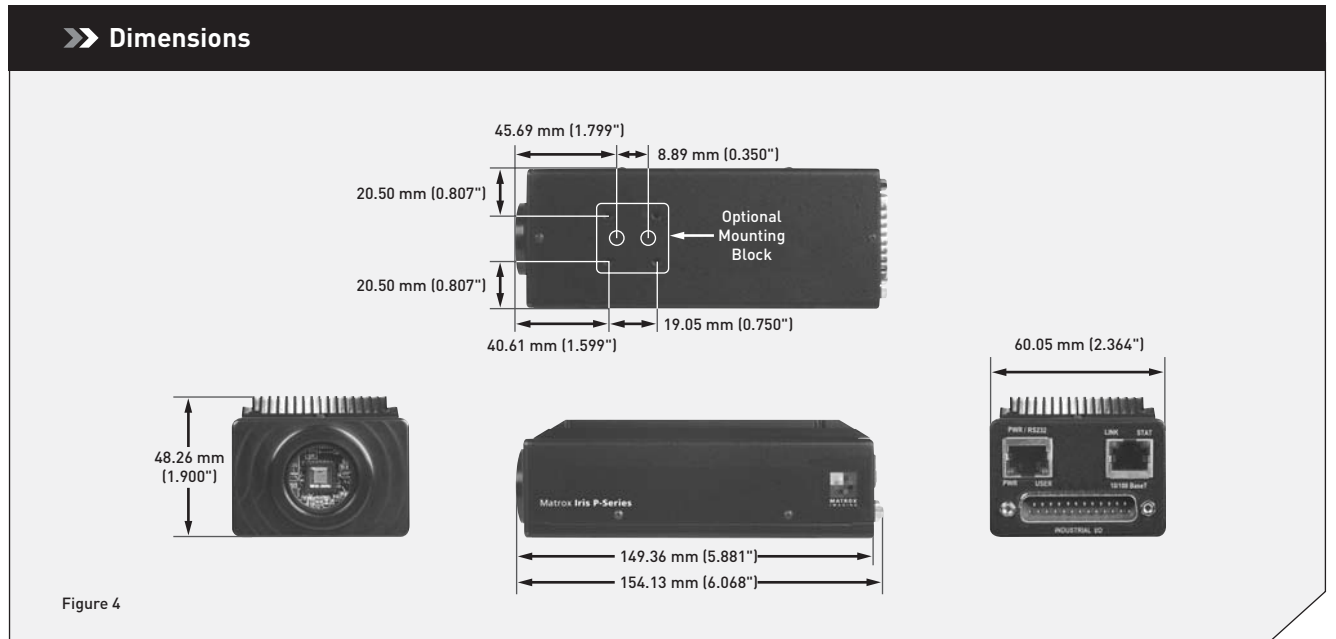


Figure 4

## Specifications

### Matrox Iris P300<sup>1</sup>

#### Sensor board

Sensor type	diagonal 4.5 mm (1/4" -type) interline transfer progressive scan CCD with square pixels
Effective resolution	659 (H) x 494 (V)
Frame rate	up to 30 fps
Pixel size	5.6 µm (H) x 5.6 µm (V)
TV resolution	480 TV lines
Gain range	2 to 36 dB
Shutter speeds	250 µs to 30 ms
External trigger latency	75 µs

#### CPU board

CPU	400MHz Intel® ULP Celeron®
Volatile memory	128 MB SDRAM
Non-volatile memory	64 MB flash disk

#### I/O board

I/O board	10/100 Mbit Ethernet
Serial communication interface	RS-232
Digital I/Os	8 inputs and 8 outputs

#### Mechanical, electrical and environmental information

Dimensions	refer to Figure 4
Lens type	CS mount
Connectors	RJ-45 for power and RS-232, RJ-45 for Ethernet and DB-25 for digital I/Os
Weight	375 g (13.2 oz.)
Power consumption (typical)	0.3 A @ 24 V <sub>DC</sub> or 7 W
Digital I/O ratings	400 mA max. @ 5 to 24 V <sub>DC</sub>
Operating temperature	0 °C to 40 °C (32 °F to 104 °F)
Ventilation requirements	natural convection
Operating humidity	up to 95% (non-condensing)
Certifications	FCC class A pending and CE class A pending

#### Software environment

Operating system	Microsoft® Windows® CE .NET 4.1 (headless configuration with TCP/IP, telnet, http and ftp services)
PC development tools	Microsoft® eMbedded Visual C++® 4.0 with Service Pack 2 <sup>2</sup> and Matrox Imaging Library (MIL) for Windows® CE .NET
PC requirements	Microsoft® Windows® XP Professional, 128 MB of memory, 450 MB hard disk space, Microsoft® Internet Explorer 6.0 and 100 Mbit Ethernet port

#### Corporate headquarters:

Canada and U.S.A.  
Matrox Electronic Systems Ltd.  
1055 St. Regis Blvd.  
Dorval, Quebec H9P 2T4  
Canada  
Tel: +1 (514) 685-2630  
Fax: +1 (514) 822-6273

#### Offices:

Europe, Middle East & Africa  
Matrox VITE Limited  
Sefton Park  
Stoke Poges  
Buckinghamshire  
SL2 4JS, U.K.  
Tel: +44 (0) 1753 665511  
Fax: +44 (0) 1753 665597

France  
Matrox France SARL  
2, rue de la Couture  
Silic 225  
94528 Rungis Cedex  
Tel: +33 (0) 1 45 60 62 00  
Fax: +33 (0) 1 45 60 62 05

Germany  
Matrox Electronic Systems GmbH  
Inselkammerstr. 8  
D-82008 Unterhaching  
Germany  
Tel: +49 (0) 1 89 62 17 00  
Fax: +49 (0) 1 89 614 97 43

## Ordering Information

### Hardware

#### Part number

#### Description

IRIS-P300 <sup>1</sup>	Matrox Iris P-Series smart camera with VGA format CCD sensor, 400 MHz ULP Celeron, 128MB SDRAM and 64 MB flash disk.
IRIS-SK	Matrox Iris P-Series starter kit accessories. Includes power supply, power supply/RS-232 cable, CS-mount lens and a DB-25 to open end cable for digital I/Os (requires customization).

CS-mount lenses are available from PENTAX Precision Co., Fujinon or other third parties.

### Software

#### Part number

#### Description

MIL 7 DEV CE IRIS	Matrox Imaging Library (MIL) development package for Windows® CE .NET running on Matrox Iris P-Series (see MIL brochure for more details).
-------------------	--

The MIL development package for Windows® CE .NET running on Matrox Iris P-Series requires a MIL run-time software license key.

#### Notes:

1. Call for availability including different sensors.
2. Available for download from Microsoft®.

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](mailto:imaging.info@matrox.com) or <http://www.matrox.com/imaging>

**matrox**

All trademarks by their respective owners are hereby acknowledged. Matrox Electronic Systems, Ltd. reserves the right to make changes in specifications at any time and without notice. The information furnished by Matrox Electronic Systems, Ltd. is believed to be accurate and reliable. However, no responsibility license is granted under any patents or patent rights of Matrox Electronic Systems, Ltd. Windows and Microsoft are trademarks of Microsoft Corporation. MMX and the MMX logo are registered trademarks of Intel Corporation. Printed in Canada, 12-02-2004. **\$1E-5346-B**

Preliminary