



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 single or two-piece 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.

Single or two-piece design

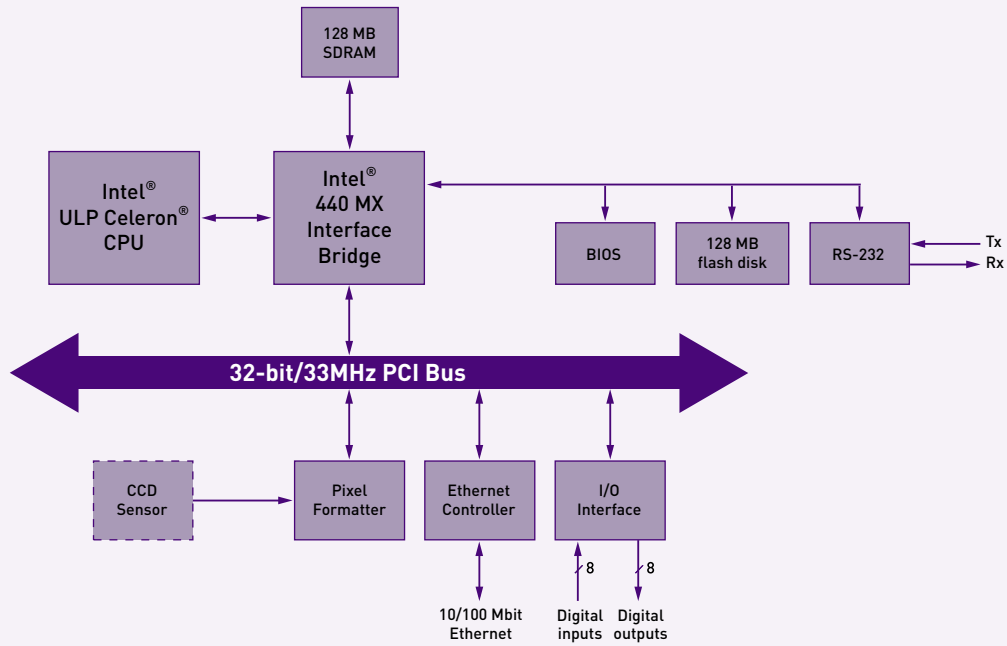
Available in a uni-body or remote head plus processor unit design, the Matrox Iris P-Series is the right fit for typical machine vision applications. The two-piece design, by way of MDR26 connectors, makes use of the standard Camera Link® cabling to connect the remote head to the processor unit.

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-process sensor data (e.g., color interpolation) releasing the camera's embedded microprocessor for more advanced image processing and analysis, communication, and control tasks.



Matrox Iris P-Series



--- in main body or remote head

Figure 1

Cross-platform Development

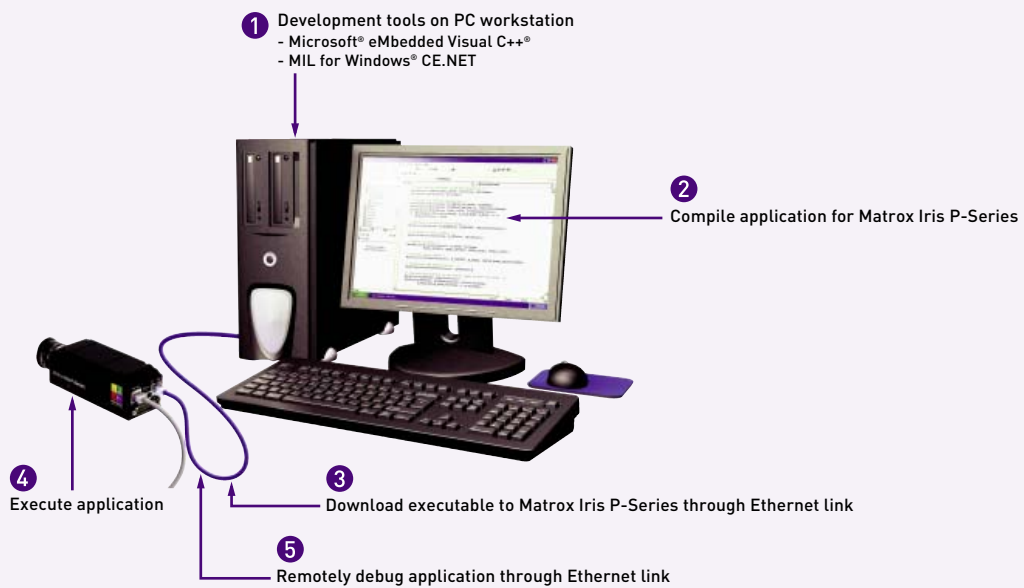


Figure 2

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.

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.

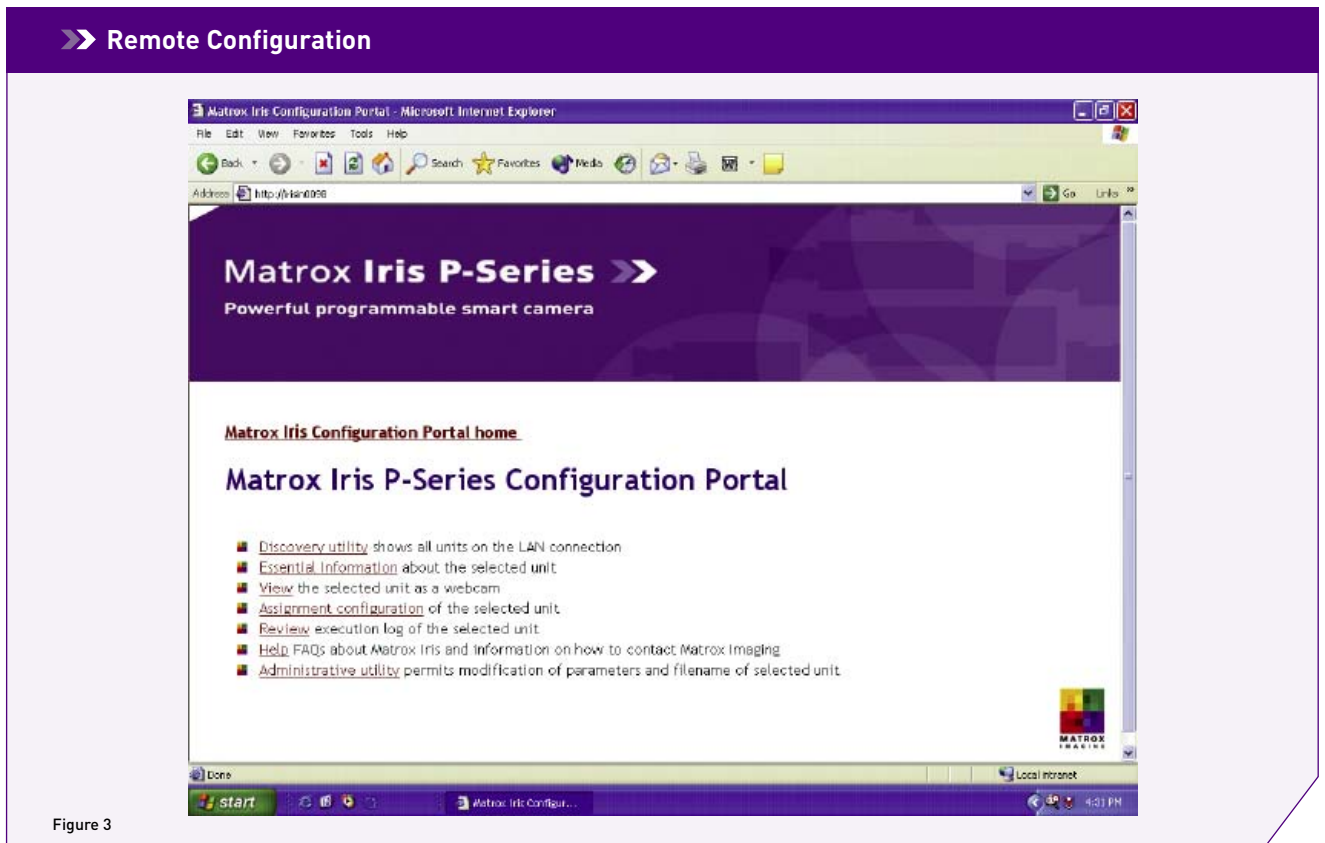


Figure 3

»» Dimensions - Uni-body

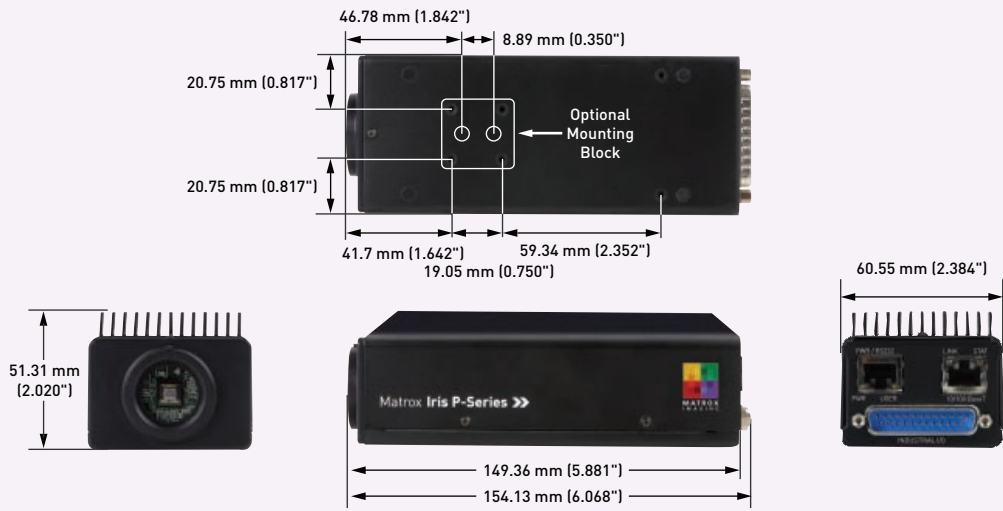


Figure 4

»» Dimensions - Remote Head and Processor Unit

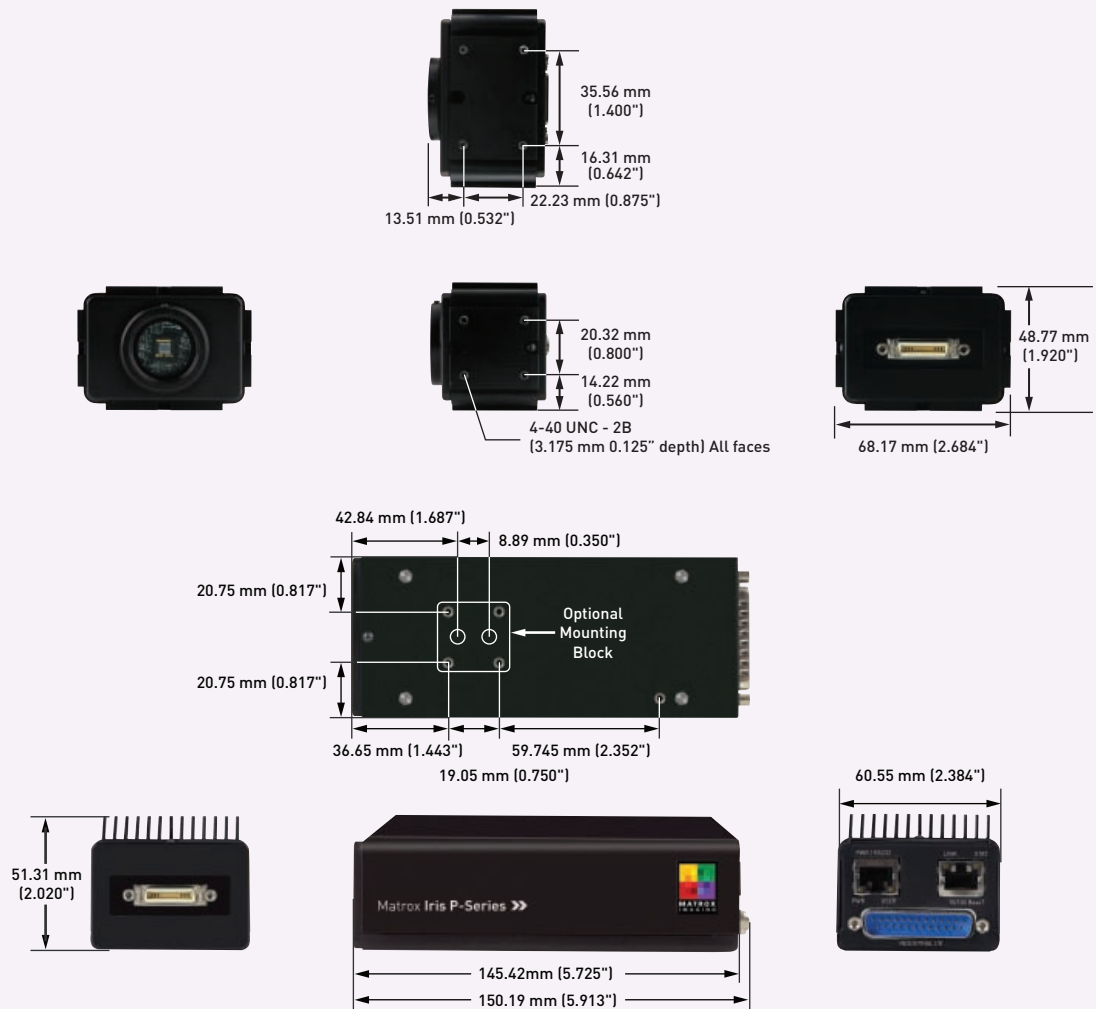


Figure 5

Specifications

	Iris P300(R)*	Iris P300C(R)*	Iris P300H(R)*	Iris P700(R)*	Iris P1200(R)*	Iris P1200H(R)*	
Sensor board							
CCD sensor ¹	Geometry	diagonal 4.5 mm (1/4"-type)	diagonal 4.5 mm (1/4"-type)	diagonal 6 mm (1/3"-type)	diagonal 6 mm (1/3"-type)	diagonal 8 mm (1/2"-type)	diagonal 8 mm (1/2"-type)
	Format	monochrome	color	monochrome	monochrome	monochrome	monochrome
	Make and model	Sony ICX098BL	Sony ICX098BQ	Kodak KAI-0340S	Sony ICX204AL	Sony ICX205AL	Sony ICX267AL
Effective resolution (H x V)	640 x 480	640 x 480	640 x 480	1024 x 768	1280 x 1024	1280 x 1024	
Frame rate	up to 30 fps	up to 30 fps	up to 100 fps	up to 20 fps	up to 7.5 fps	up to 15 fps	
Pixel size (H x V)	5.6 µm x 5.6 µm	5.6 µm x 5.6 µm	7.4 µm x 7.4 µm	4.65 µm x 4.65 µm	4.65 µm x 4.65 µm	4.65 µm x 4.65 µm	
Gain range	2 to 36 dB	2 to 36 dB	6 to 42 dB	2 to 36 dB	2 to 36 dB	2 to 36 dB	
Shutter speeds	100 µs to 0.5 s	100 µs to 0.5 s	45 µs to 83 ms	100 µs to 0.5 s	100 µs to 0.5 s	100 µs to 0.5 s	
External trigger latency	85 µs	85 µs	25 µs	75 µs	155 µs	80 µs	
External trigger to output strobe delay	2µs (minimum)						
CPU board							
CPU	400MHz Intel® ULP Celeron®						
Volatile memory	128 MB SDRAM						
Non-volatile memory	128 MB flash disk						
I/O board							
Network interface	10/100 Mbit Ethernet						
Serial interface	RS-232						
Digital I/Os	8 inputs and 8 outputs						
Mechanical, electrical and environmental information							
Dimensions	refer to Figure 4 or Figure 5						
Lens type	CS mount ²						
Connectors	RJ-45 for power and RS-232, RJ-45 for Ethernet and DB-25 for digital I/Os, and MDR26 for remote head to main body connection ³						
Remote head distance	up to 5 meters (16.4 feet)						
Weight	435 g (15.3 oz.) for uni-body / 185 g (6.5 oz.) for remote head and 435 g (15.3 oz.) for main body						
Power consumption	375 mA @ 24 VDC or 9 W (typical)						
Digital I/O ratings	100 mA max. @ 5 to 24 VDC						
Operating temperature	0 °C to 45 °C (32 °F to 113 °F)						
Ventilation requirements	natural convection						
Operating humidity	up to 95% (non-condensing)						
Certifications	FCC class A, CE class A and RoHS-compliant						
Software environment							
Operating system	Microsoft® Windows® CE 5.0 (headless configuration with TCP/IP, telnet, http and ftp services)						
PC development tools	Microsoft® Visual Studio® 2005 with SP1 and Smart Devices Extension ⁴ 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						

Ordering Information

Hardware

Part number	Description
IP300/5*	Matrox Iris P-Series smart camera with monochrome 640 x 480 30 fps CCD sensor, 400 MHz ULP Celeron, 128MB SDRAM, 128 MB flash disk and Windows® CE 5.0 license.
IP300R/5*	Same as above but with remote head and 2 m cable.
IP300C/5*	Matrox Iris P-Series smart camera with color 640 x 480 30 fps CCD sensor, 400 MHz ULP Celeron, 128MB SDRAM, 128 MB flash disk and Windows® CE 5.0 license.
IP300CR/5*	Same as above but with remote head and 2 m cable.
IP300H/5*	Matrox Iris P-Series smart camera with monochrome 640 x 480 100 fps CCD sensor, 400 MHz ULP Celeron, 128MB SDRAM, 128 MB flash disk and Windows® CE 5.0 license.
IP300HR/5*	Same as above but with remote head and 2 m cable.
IP700/5*	Matrox Iris P-Series smart camera with monochrome 1024 x 768 20 fps CCD sensor, 400 MHz ULP Celeron, 128MB SDRAM, 128 MB flash disk and Windows® CE 5.0 license.
IP700R/5*	Same as above but with remote head and 2 m cable.
IP1200/5*	Matrox Iris P-Series smart camera with monochrome 1280 x 1024 7.5 fps CCD sensor, 400 MHz ULP Celeron, 128MB SDRAM, 128 MB flash disk and Windows® CE 5.0 license.
IP1200R/5*	Same as above but with remote head and 2 m cable.
IP1200H/5*	Matrox Iris P-Series smart camera with monochrome 1280 x 1024 15 fps CCD sensor, 400 MHz ULP Celeron, 128 MB SDRAM, 128 MB flash disk and Windows® CE 5.0 license.
IP1200HR/5*	Same as above but with remote head and 2 m cable.
IRIS-PWR+CBL*	Matrox Iris power supply and cables kit. Includes power supply with all power cords (North America, Europe and UK), power supply/RS-232 cable, DB-25 to open end cable for digital I/Os (requires customization) and mounting block.

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Hardware (cont.)

Part number	Description
IRIS-LENSES*	Matrox Iris lenses kit. Includes one CS-mount 4 mm lens and one CS-mount 8 mm lens (kit does not apply for IP1200[R]).
IRIS-1200LENS*	Matrox Iris IP1200[R] lens. Includes one C-mount 12 mm lens and a C to CS-mount adapter ring.

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

Software

Part number	Description
MIL 8 DEV CE5 IRIS	Matrox Imaging Library (MIL) development package for Windows® CE 5.0 running on Matrox Iris P-Series. Includes CD with MIL and online documentation, and a MIL User Guide manual (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.

Software Maintenance Program

Included in the original purchase price of MIL for Windows® CE .NET running on Matrox Iris P-Series development package, it entitles registered users to one year of technical support and free updates⁵.

Part number	Description
MIL CE MAINT	One year program extension for MIL for Windows® CE .NET development package.

Notes:

1. Interline transfer progressive scan CCD with square pixels.
2. Can also accommodate a C mount lens when using a 5 mm extension tube.
3. Use standard Camera Link® cables.
4. Available from Microsoft®.
5. May require a new MIL run-time software license key.