



Smart cameras

Matrox Iris P700 Wafer Reader >>

All-in-one programmable wafer ID mark reader.



Key features

- > highly-integrated two-piece design
- > specially crafted LED-based illumination and lens
- > high-fidelity high-resolution monochrome CCD image sensor
- > embedded Intel® architecture processor running Microsoft® Windows® CE .NET
- > programmed using familiar Microsoft® development tools and Matrox Imaging Library (MIL)
- > industry-proven MIL algorithms for reading SEMI™ standard wafer ID marks¹
- > web-based configuration and monitoring
- > Ethernet network interface
- > RS-232 serial communication
- > auxiliary digital I/Os

The right fit for automated wafer tracking

Matrox Iris P700 Wafer Reader is a complete cost-effective imaging system specifically designed for reading ID marks on semiconductor wafers. It incorporates illumination, optics and sensor in a compact remote head connected to a small footprint processor unit. The processor unit runs the industry-proven Matrox Imaging Library (MIL) character recognition and code reading software, which together recognize SEMI™ standard alphanumeric, bar and matrix code wafer ID marks¹. The Matrox Iris P700 Wafer Reader is the right fit for automated wafer tracking.

Specifically designed imaging system

Matrox Iris P700 Wafer Reader includes the necessary illumination, optics and sensor required for producing clear and consistent images needed for reliable reading of wafer ID marks. Illumination is based on long-life LEDs with independent bright and dark field intensity control, which is essential for imaging the specular surface of semiconductor wafers. A custom lens insures that the CCD image sensor generates the sharpest high-resolution image of a wafer ID mark. The remote camera head, with its integrated lighting and lens, connects to the processor unit up to 5 meters (16.4 feet) away using standard Camera Link® cabling.

The processor units makes use of a Intel® Ultra Low Power (ULP) Celeron®, a powerful embedded processor for performing the actual wafer ID mark reading and also handling external communication and device control. A 10/100 Mbit Ethernet interface provides the connectivity to the factory floor network while 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.

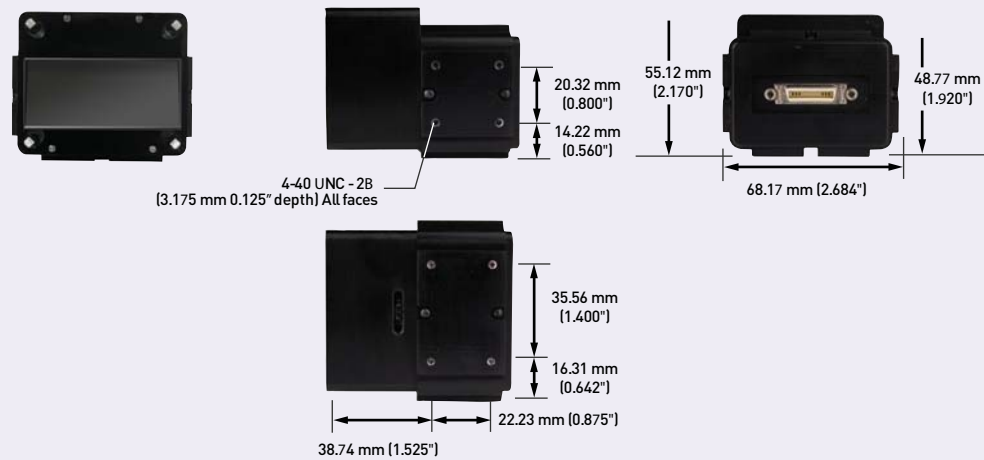
Read SEMI™ standard wafer ID marks

Matrox Iris P700 Wafer Reader runs the MIL character recognition software for reading alphanumeric marks based on the SEMI™ M12, M13 and M1.15 specifications. It also runs the MIL code reading software for decoding bar (BC412) and matrix (DataMatrix) codes based on the SEMI™ T7 and M1.15 specifications¹. Both software tools are field-proven to be robust to degraded ID marks often encountered in wafer manufacturing.



» Dimensions

Remote head



Processor unit

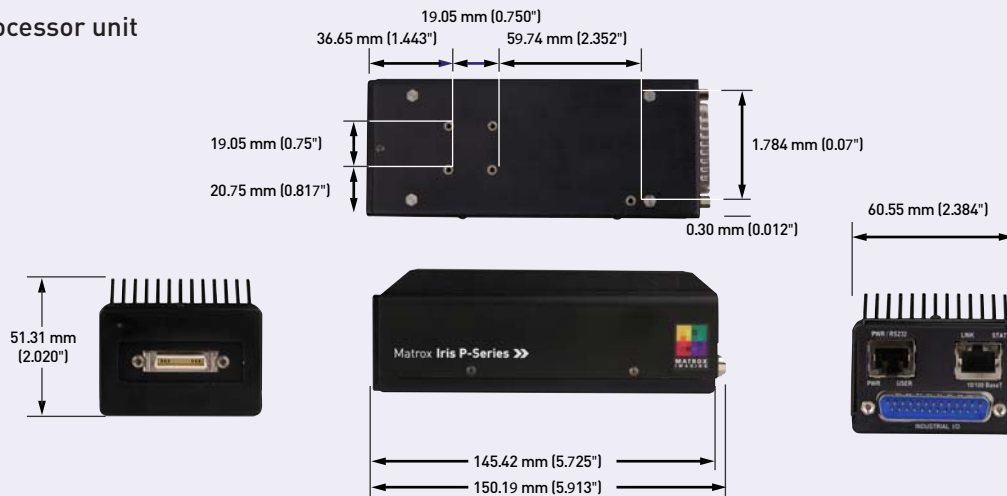


Figure 1

Software environment

Matrox Iris P700 Wafer Reader comes pre-installed with Microsoft® Windows® CE .NET real-time operating system. Programming a MIL-based application under Windows® CE .NET is done using a cross-platform environment. 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.

Configuration and monitoring

The configuration and monitoring of Matrox Iris P700 Wafer Reader is performed through resident web pages accessed remotely through Microsoft® Internet Explorer. This web-based interface allows a user with the appropriate privileges to view status information and configure operational parameters. It also allows an operator to remotely view live video for camera alignment and focusing.

» Reading wafer ID marks



Matrox Iris P700 Wafer Reader runs industry-proven software to read SEMI™ standard wafer ID marks.

Specifications

Remote head

Illumination	LEDs with independent bright (610nm) and dark field (617nm) intensity control
Field of view	26 mm H x 13 mm W (1.02" H x 0.51" W) @ 35 mm working distance
Working distance	10-60 mm (0.40" - 2.35"); 35 mm (1.38") optimal
Depth of field	3 mm (0.12")
Sensor type	diagonal 6 mm (1/3"-type) interline transfer progressive scan monochrome CCD with square pixels (Sony ICX204AL)
Effective resolution	1024 (H) x 768 (V)
Frame rate	up to 20 fps
Pixel size	4.65 µm (H) x 4.65 µm (V)
Gain range	2 to 36 dB
Shutter speeds	100 µs to 0.5 s
External trigger latency	85 µs

Processing unit

CPU	400MHz Intel® ULP Celeron®
Volatile memory	128 MB SDRAM
Non-volatile memory	128 MB flash disk
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 1
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 ²
Weight	T.B.D.
Power consumption	0.6 A @ 24 VDC or 14.4 Watts (with illumination on)
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

Supported SEMI™ standard wafer ID marks using Matrox Imaging Library (MIL)

Alphanumeric	M12, M13 and M1.15
Bar and matrix code	T7 and M1.15

Software environment

Operating system	Microsoft® Windows® CE .NET 4.2 (headless configuration with TCP/IP, telnet, http and ftp services)
PC development tools	Microsoft eMbedded Visual C++ 4.0 with Service Pack 4 ³ and 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 100Mbit Ethernet port

Ordering Information

Hardware

Part number	Description
IP700WR*4	Matrox Iris P-Series wafer reader ⁴ with LED lighting, lens, monochrome 1024 x 768 20 fps CCD sensor, 400 MHz ULP Celeron, 128 MB SDRAM and 128 MB flash disk.

Software

Part number	Description
MIL 8 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.

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. SEMI™ T4 not supported.
2. Use standard Camera Link[®] cables.
3. Available for download from Microsoft[®].
4. Contact local representative or Matrox Imaging Sales for availability.
5. May require a new MIL run-time software license key.

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