



Frame grabbers

# Matrox Solios eCL/XCL >>

Cost-effective Camera Link® frame grabber with optional customizable FPGA-based processing core.



## Key features

- > x4 PCIe™ (eCL) or PCI-X® (XCL) card
- > handles two fully independent Base or a single Medium Camera Link® configuration<sup>1</sup>
- > acquires at up to 66/85 MHz
- > 64 MB acquisition buffer
- > captures from frame and line scan cameras
- > performs complete image reconstruction from multi-tap cameras
- > serial communication ports mapped as PC COM ports
- > support for rotary encoders with quadrature output<sup>2</sup>
- > optional customizable FPGA-based processing core<sup>2</sup>
- > available software is sold separately and includes Matrox Imaging Library (MIL)/ActiveMIL, MIL-Lite/Active MIL-Lite, Matrox Inspector and Matrox FPGA Developer's Kit (FDK) – Altera® Edition
- > supports Microsoft® Windows® XP<sup>3,4</sup> and Linux<sup>5,6</sup>
- > royalty-free redistribution of MIL's image processing module<sup>7</sup>

## Cost-optimized and value-packed design

The Matrox Solios eCL/XCL frame grabber strikes a perfect balance between functionality and cost. Its versatile Camera Link® acquisition capabilities and high-performance PCI Express® (PCIe™) or PCI-X® bus interface make the Matrox Solios eCL/XCL a good match for mainstream cameras. An optional customizable FPGA-based processing core<sup>2</sup> is available to accelerate or offload image processing tasks. The Matrox Solios eCL/XCL is the right choice for cost sensitive applications.

## Versatile Camera Link® interface

Matrox Solios eCL/XCL is programmed to operate as a dual-Base or single-Medium Camera Link® frame grabber. It can simultaneously capture from two completely independent Camera Link® cameras using the Base configuration or from a single Camera Link® camera using the Medium configuration<sup>1</sup>. Matrox Solios eCL/XCL is able to handle the most popular industrial or scientific frame and line scan cameras including complete image reconstruction from multi-tap cameras. It can also transparently convert between monochrome and packed/planar RGB color spaces enabling the optimum representation of image data for processing and/or display.

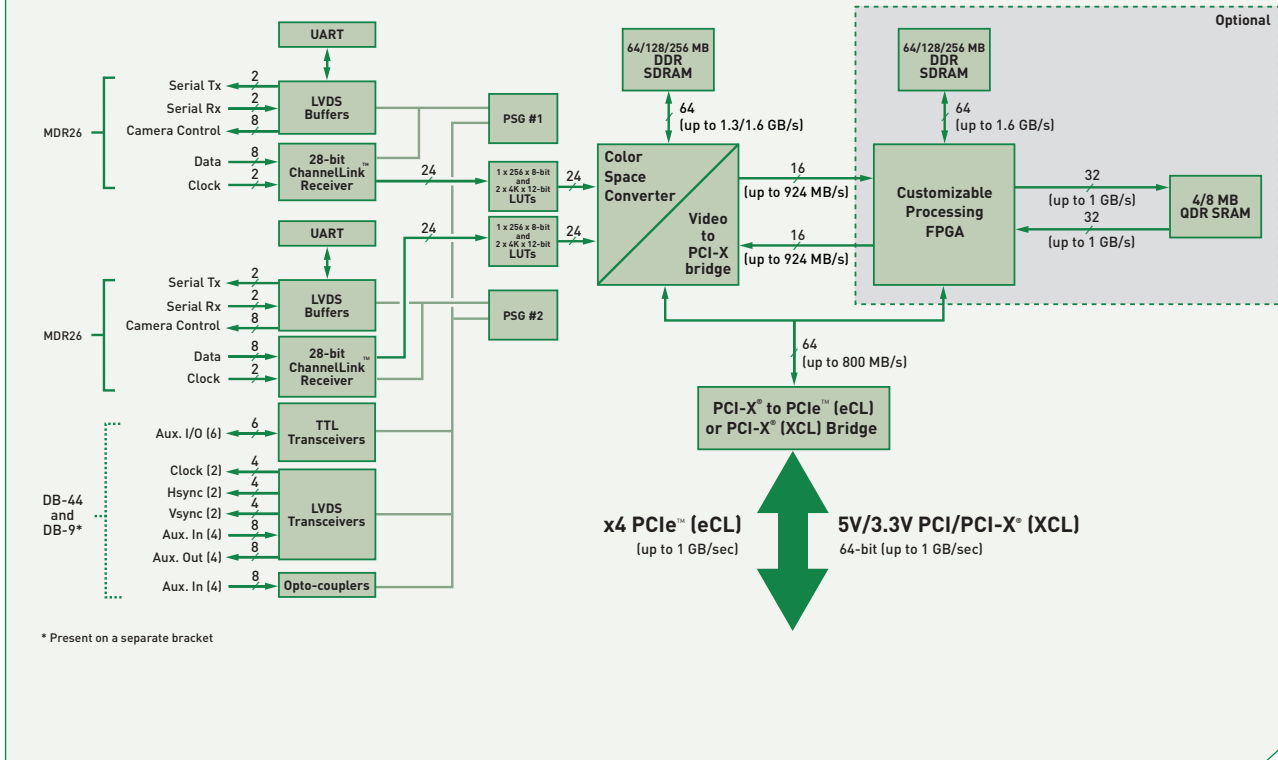
## Choice of high-performance host bus interfaces



Four lane (x4) PCIe™ and PCI-X® are the interfaces used to connect to the host PC on the Matrox Solios eCL and Matrox Solios XCL boards respectively. PCIe™ is the follow-on to conventional PCI and PCI-X®. Version 1.x of PCIe™ operates at 2.5 GHz to deliver a peak bandwidth of 1GB/sec over a x4 implementation. PCI-X® is a high-performance backwards-compatible enhancement to conventional PCI. Version 1.0a of PCI-X® specifies a 64-bit physical connection running at speeds of up to 133 MHz resulting in a peak bandwidth of up to 1 GB per second.



## Matrox Solios eCL/XCL



### Optional FPGA-based processing core<sup>2</sup>

For applications that require some image processing acceleration or the offloading of some image processing tasks from the host CPU, Matrox Solios eCL/XCL is available with a configurable FPGA-based processing core. This optional processing core is based on the Altera<sup>®</sup> Stratix<sup>™</sup> family of pin-compatible FPGA devices<sup>8</sup> and can include a sizable amount of DDR SDRAM and/or a smaller amount of faster QDR SRAM. Data to and from the processing core travels over the onboard secondary PCI-X bus and/or a dual-simplex link to the video capture controller.

### Software

Software support is available for Windows<sup>®</sup> XP<sup>3,4</sup> and Linux<sup>5,6</sup>, and consists of Matrox Imaging Library (MIL)/ActiveMIL or MIL-Lite/ActiveMIL-Lite development toolkits for creating custom applications. Included with these development toolkits are ready-made configurations for the FPGA-based processing core that implement a wide variety of image processing functions<sup>9</sup>. Custom configurations can also be created using the Matrox FPGA Developer's Toolkit (FDK). Matrox Solios eCL/XCL is also supported by Matrox Inspector interactive Windows<sup>®</sup> imaging software.

## Specifications

### Hardware

- x4 PCIe™ card or PCI/PCI-X® card with universal 64-bit card edge connector (64-bit 33/66 MHz 5V/3.3V PCI and 64-bit 66/100/133 MHz PCI-X®)
- 64MB of 83/100 MHz DDR SDRAM for acquisition
- handles two independent Base or a single Base/Medium Camera Link® port(s)
- Channel Link™ speed of up to 66/85 MHz
- supports frame and line-scan video sources
- full reconstruction from multi-tap sources
- four 4K x 12-bit and two 256 x 8-bit LUTs
- six TTL configurable auxiliary I/Os
- four LVDS configurable auxiliary inputs
- four LVDS configurable auxiliary outputs
- separate LVDS pixel clock, hsync and vsync outputs
- four opto-isolated configurable auxiliary inputs
- serial communication port(s) mapped as PC COM ports
- optional customizable FPGA-based processing core<sup>2</sup>
  - Altera® Stratix™ family<sup>8</sup>
  - 64, 128 or 256MB of 100MHz DDR SDRAM
  - 4 or 8MB of 133MHz QDR SRAM

### Dimensions and environmental information

- 19.1 L x 11.4 H x 1.57 W cm (7.5" x 4.5" x 0.62") from bottom edge of goldfinger to top edge of board and without bracket
- power consumption (typical): 2.75A @ 3.3v or 9.1W, 0.49A @ 5V or 2.4W, or 11.5W total<sup>10</sup>
- operating temperature: 0°C to 55° C (32° F to 131° F)
- relative humidity: up to 95% (non-condensing)
- FCC class A
- CE class A
- RoHS-compliant

### Software Environment

- host driver for Microsoft® Windows® XP<sup>3, 4</sup> and Linux<sup>5, 6</sup>
- programmed under Microsoft® Windows® using MIL/MIL-Lite (.NET DLLs) with Microsoft® Visual C++® (.NET 2003)
- programmed under Microsoft® Windows® using ActiveMIL/ActiveMIL-Lite (ActiveX controls) with Microsoft® Visual Basic® .NET 2003 or Visual C++® .NET 2003
- processing FPGA programmed under Microsoft® Windows® XP<sup>3, 4</sup> using Matrox FDK with Altera® Quartus II®<sup>11</sup>
- programmed under Linux<sup>5, 6</sup> using MIL/MIL-Lite with GNU Compiler Collection (GCC)

## Ordering Information

### Hardware

Part number	Description
SOL 6M CL*	Dual-Base or single-Medium up to 66 MHz Camera Link® PCI-X® frame grabber with 64 MB DDR SDRAM and cable adapter board.
SOL 6M FC*	Dual-Base or single-Medium up to 85 MHz Camera Link® PCI-X® frame grabber with 64 MB DDR SDRAM and cable adapter board.
SOL 6M CL E*	Dual-Base or single-Medium up to 66 MHz Camera Link® x4 PCIe™ frame grabber with 64 MB DDR SDRAM and cable adapter board.
SOL 6M FC E*	Dual-Base or single-Medium up to 85 MHz Camera Link® x4 PCIe™ frame grabber with 64 MB DDR SDRAM and cable adapter board.

### Software

Part number	Description
MIL LITE 8 WIN	MIL-Lite board control library for Microsoft® Windows® XP <sup>3, 4</sup> (see MIL-Lite brochure for more details).
MIL 8 WIN P or U	Matrox Imaging Library (MIL) for Microsoft® Windows® XP <sup>3, 4</sup> (see MIL brochure for more details).
MIL LITE 8 LNX <sup>5, 6</sup>	MIL-Lite board control library for Linux <sup>5, 6</sup> (see MIL-Lite brochure for more details).
MIL 8 LNX U <sup>5, 6</sup>	Matrox Imaging Library (MIL) for Linux <sup>5, 6</sup> (see MIL brochure for more details).
SOL FDK AQ2	Matrox FPGA Developer's Kit (FDK) – Altera® Edition for Windows® XP <sup>4</sup> (see FDK brochure for more details).
INSPECTOR 8 P or U	Matrox Inspector interactive Windows® imaging software.

### Cables

Camera Link® cables available from camera manufacturer, 3M Interconnect Solutions ([www.3m.com](http://www.3m.com)), Intercon1 ([www.nortechsys.com/intercon](http://www.nortechsys.com/intercon)) or other third parties. Cables for cable adapter boards available from third parties.

#### Notes:

1. Refer to Camera Link® specification for more information.
2. Only available with up to 85 MHz Camera Link® acquisition speed configurations.
3. Microsoft® Windows® 2000 support available on select products. Contact local representative or Matrox Imaging Sales for availability.
4. 32-bit edition.
5. Contact local representative or Matrox Imaging Sales for availability.
6. Contact local representative or Matrox Imaging Sales for supported distribution.
7. Only if FPGA-based processing core is present.
8. EP1S10, 20, 25, 30 and 40 devices.
9. Refer to Matrox FDK datasheet for list of functions.
10. Matrox Solios XCL without FPGA-based processing core.
11. Refer to Matrox FDK datasheet for supported versions.

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