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 (eCL/XCL), or a single Full (eCL-F/XCL-F) Camera Link® configuration[1]
- 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 with up to 10 taps[2]
- serial communication port(s) mapped as PC COM port(s)
- support for rotary encoders with quadrature output[3]
- optional customizable FPGA-based processing core[3]
- 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[4, 5] and Linux[6, 7]
- royalty-free redistribution of MIL's image processing module[8]

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[3] 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

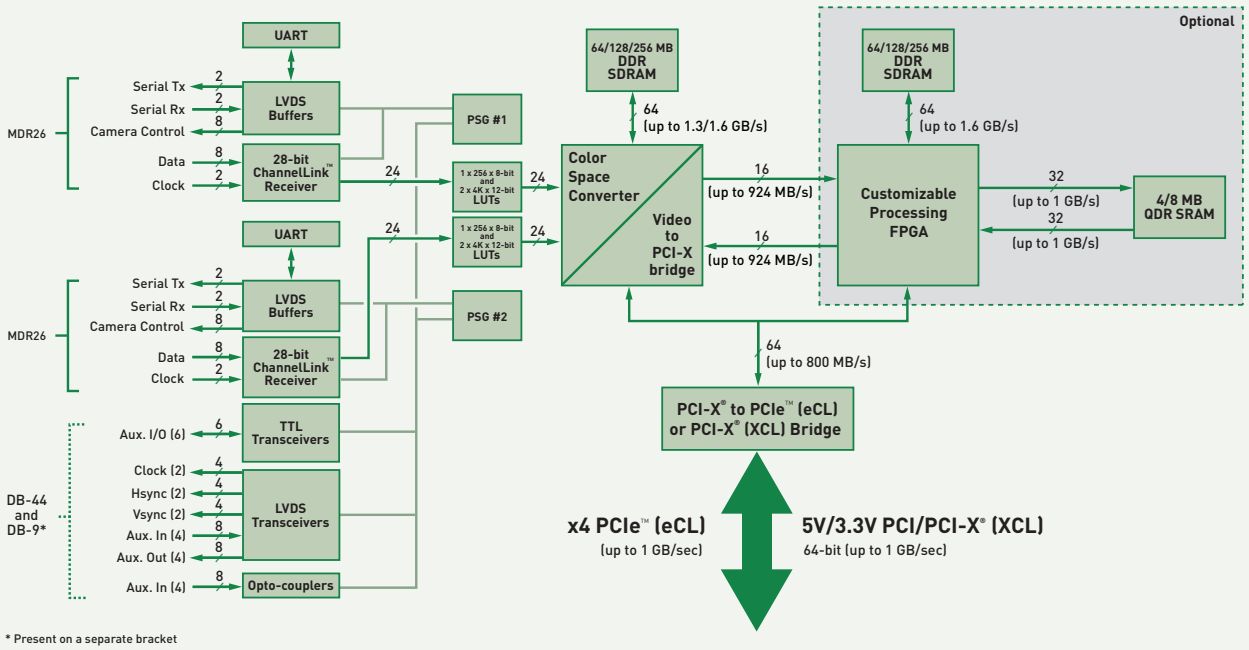
Matrox Solios eCL/XCL is available in two versions, a configurable dual-Base/single-Medium Camera Link® frame grabber (eCL/XCL) or a fixed single-Full Camera Link® frame grabber (eCL-F/XCL-F). The former can simultaneously capture from two completely independent Camera Link® cameras using the Base configuration or from a single Camera Link® camera using the Medium configuration[1]. The latter can capture from a single Camera Link® camera using the Full configuration[1] up to 10-taps. Matrox Solios eCL/XCL(-F) 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(-F) and Matrox Solios XCL(-F) 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.

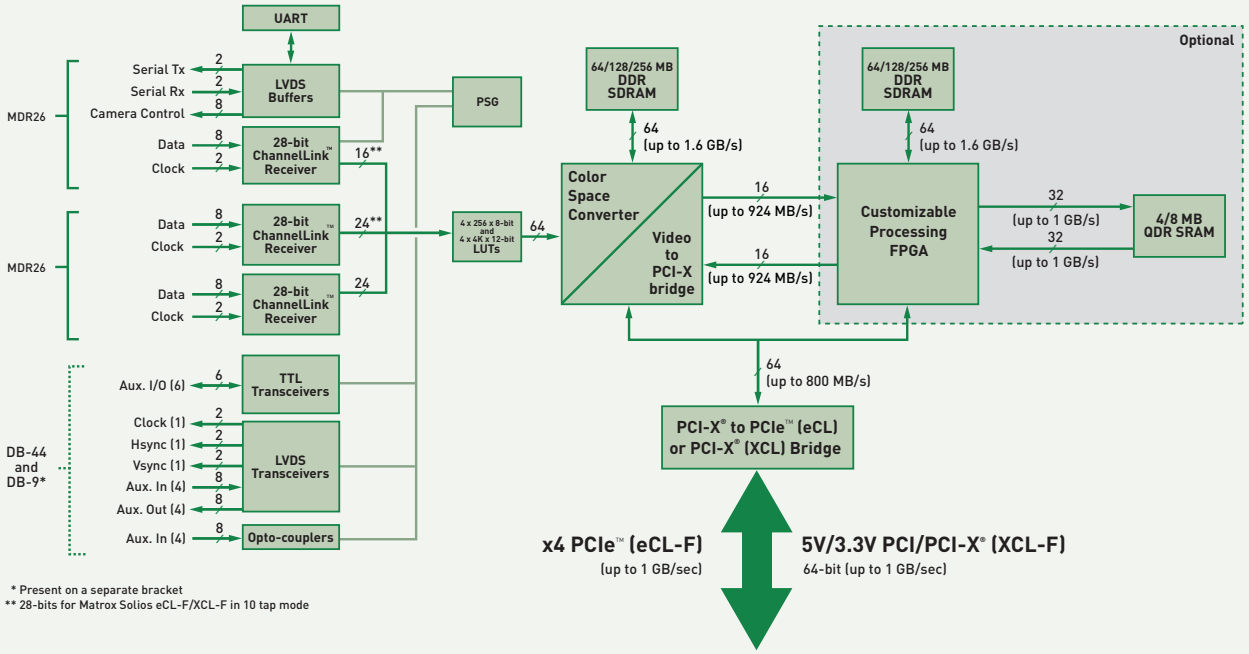
MATROX IMAGING

Matrox Solios eCL/XCL



* Present on a separate bracket

Matrox Solios eCL-F/XCL-F



* Present on a separate bracket
** 28-bits for Matrox Solios eCL-F/XCL-F in 10 tap mode

Optional FPGA-based processing core[3]

For applications that require some image processing acceleration or the offloading of some image processing tasks from the host CPU, Matrox Solios eCL/XCL(-F) is available with a configurable FPGA-based processing core. This optional processing core is based on the Altera® Stratix™ family of pin-compatible FPGA devices[9] 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® XP[4, 5] and Linux[6, 7], 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[10]. Custom configurations can also be created using the Matrox FPGA Developer's Toolkit (FDK). Matrox Solios eCL/XCL(-F) is also supported by Matrox Inspector interactive Windows® 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) (eCL/XCL) or a single Base/Medium/Full Camera Link® port (eCL-F/XCL-F)[1]
- 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 (eCL/XCL) or four 4K x 12-bit and four 256 x 8-bit LUTs (eCL-F/XCL-F)
- 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 port(s)
- optional customizable FPGA-based processing core[3]
  - Altera® Stratix™ family[9]
  - 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[11]
- 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[4, 5] and Linux[6, 7]
- programmed under Microsoft® Windows® using MIL/MIL-Lite ('C' 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[5] using Matrox FDK with Altera® Quartus II®[12]
- programmed under Linux[6, 7] 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 FCF*	Single-Full (10-taps) 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.
SOL 6M FCF E*	Single-Full (10-taps) 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[4, 5] (see MIL-Lite brochure for more details).
MIL 8 WIN P *or* U	Matrox Imaging Library (MIL) for Microsoft® Windows® XP[4, 5] (see MIL brochure for more details).
MIL LITE 8 LNX[4, 7]	MIL-Lite board control library for Linux[4, 7] (see MIL-Lite brochure for more details).
MIL 8 LNX U[4, 7]	Matrox Imaging Library (MIL) for Linux[4, 7] (see MIL brochure for more details).
SOL FDK AQ2	Matrox FPGA Developer's Kit (FDK) – Altera® Edition for Windows® XP[5] (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), Intercon1 (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. 10-tap support only available with single-Full Camera Link® configurations (eCL/XCL-F).
3. Only available with up to 85 MHz Camera Link® acquisition speed configurations. Contact local representative or Matrox Imaging Sales for availability of single-Full Camera Link® configurations (eCL/XCL-F).
4. Microsoft® Windows® 2000 support available on select products. Contact local representative or Matrox Imaging Sales for availability.
5. 32-bit edition.
6. Contact local representative or Matrox Imaging Sales for availability.
7. Contact local representative or Matrox Imaging Sales for supported distribution.
8. Only if FPGA-based processing core is present.
9. EP1S10, 20, 25, 30 and 40 devices.
10. Refer to Matrox FDK datasheet for list of functions.
11. Matrox Solios XCL without FPGA-based processing core.
12. Refer to Matrox FDK datasheet for supported versions.

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