SILICON**SOFTWARE**

A-Series GigabitEthernet

microEnable IV AQ4-GE

Quad port PCIe frame grabber for GigE Vision

The microEnable IV AQ4-GE is a quad-port frame grabber for four independent GigE Vision cameras.

All integrated image acquisition and image pre-processing functions of the microEnable IV VQ4-GE are executed on the system FPGA in real time, and offer high performance and robust and reliable acquisition technology at the same time.

Whenever a professional environment for GigabitEtherent based system is required, microEnable IV AQ4-GE will guarantee an industrial use with comprehensive Machine Vision features. On-board image reconstruction will reduce the interrupt load of the system and the load by memory transfer. The host-CPU is dramatically unburdened. Among others, optimized drivers and the use of jumbo packets help to work with a secure and fail-save image processing system and industrial performance. With its wide range of additional functionality and essential functions, microEnable IV AQ4-GE enables the professional use of GigabitEthernet in the Machine Vision industry, which was well-known from Camera Link environments. Digital interfaces for signal input and output allow for a control of external devices with low latencies, and a Software Development Kit (SDK) tailored for Machine Vision enables the comfortable integration of application of your own.

Camera Interface

- Camera Link
- Power over Camera Link
- ✓ GigE Vision

GigabitEthernet Standards

- ✓ GigE Vision
- ✓ Gen<i>Cam

Camera Interface

- Camera Link Connectors
  - MDR26
  - SDR26
- ✓ GigabitEthernet Connectors
  - 4 RJ45

PC Interface

- PCI 32/64bit
- ✓ PCI Express
  - PCIe x1 (single lane)
  - ▶ PCIe x4 (quad lanes)

Connectivity Features

- ✓ GPIO/Trigger Connector
- PixelPlant Connector
- CLIO Connector

Acquisition Features

- Camera Pixel Clock Support
  - 85 MHz
- ✓ Area Scan Cameras
  - ▶ 8k * 4k max. image size
- ✓ Line Scan Cameras
  - ▶ 16k max. image width
- ✓ Grayscale Cameras
  - ▶ 8bit resolution
  - ▶ 16bit resolution
- ✓ Color Cameras
  - ▶ 24bit resolution (RGB)
  - ▶ 48bit resolution (RGB)
  - ▶ 24bit resolution (Bayer CFA)
  - 36bit resolution (Bayer CFA)
- Mixed Mode (requires VisualApplets)
  - Area Scan + Line Scan Cameras
  - Grayscale + Color Cameras
  - Arbitrary Combinations

AddOn Products

- ✓ GPIO Boards
- ✓ GPIO Boards, opto-isolated
- CLIO (Camera Link Replicator)
- PixelPlant (Processing Extension)

Physical Board Properties

- ▶ 168 mm length x 111 mm height
- ▶ Operating temperature 0°C - 40°C

Product Features

- ✓ Acquisition Buffer
  - ▶ 256 MB DDR-RAM
- ✓ FPGA System Processor
- FPGA Vision Processor
  - Xilinx Spartan 2
  - Xilinx Spartan 3
- ✓ Sustainable Transfer Rate (max.)
  - ▶ 760 MBytes/sec.

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Image Acquisition Features

- Synchronous Acquisition Process
- Multi-Camera Acquisition Ability
- Knee Lookup Table
- Basic Image Processing, e. g. Brightness, Contrast and Gamma Correction
- Real-Time Bayer Conversion
- Internal 16bit Processing
- Regions of Interest (ROI)
- Hardware Generated Image Number
- Reads Gen<i>Cam Configuration
- Highly Customizable I/O System
- Dig I/O Signals

... and further ones

Special Features

- Support of Jumbo Packets
- Automatic Image Reconstruction from Data Packets
- Reduction of Interupt Load to 1 IRQ/img
- Reduction of CPU Load by Optimized Drivers

... and further ones

Software Products

- Device Drivers
- Firmware Flasher
- microDisplay
- microDiagnostics
- GigE Explorer
- microEnable SDK

Processing Libraries

incl.	AcquisitionApplets
	SmartApplets Base
	SmartApplets Extended
	VisualApplets Base
	VisualApplets Blob
	VisualApplets Compression

Processing Licenses (Base version)

- SmartApplets enabled
- VisualApplets enabled

Operation Systems

Windows XP	32bit	64bit
Windows Vista	32bit	64bit
Windows 7	32bit	64bit
Linux (Kernel 2.6.23+)	32bit	64bit

Hardware/Software Compatibility

new product line
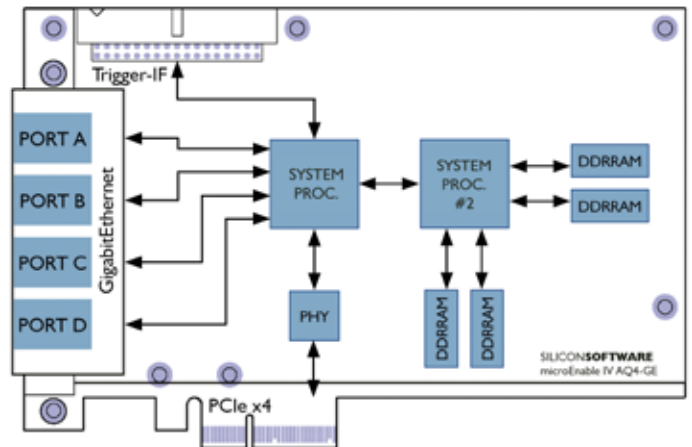
Scematic layout of microEnable IV AQ4-GE

Supported Features Sorted by Hardware Applets for microEnable IV AQ4-GE

		Quad Area Bayer 24	Quad Area Gray 8	Quad Area Gray 16	Quad Area RGB 24	Quad Line Gray 8	Quad Line Gray 16	Quad Line RGB 24
Camera Support	GigE Vision	■	■	■	■	■	■	■
	Gen<i>Cam	■	■	■	■	■	■	■
Camera Type	Area Scan / Line Scan	A	A	A	A	L	L	L
	GrayScale / RGB / Bayer	BAY	G	G	RGB	G	G	RGB
	Supported Cameras	4	4	4	4	4	4	4
Color Processing	White Balancing	■						
	Bayer Bilinear Algorithm	■						
	Look-up Table		■					
	Image Enhancements		■					
Image Enhancement	Median Filter		■					■
	Image Processing		■					■
Image Correction	Image Format Reconstruction	■	■	■	■	■	■	■
Signal Control	Software trigger	■	■	■				
	Digital input signals	2	2	2				
	Digital output signals	2	2	2				
	I/O boards opto/TTL available	■	■	■	■	■	■	■
Performances	Max. width [in k pixels]	4	8	8	8	16	16	16
	Max. height [in k lines]	8	4	4	4	16	16	16
Image Formats	Gray8 (8bit output)		■			■		
	Gray16 (16bit output)			■			■	
	RGB 24 (3x8bit output)	■			■			■