

PC_EYE/MCG

Multi-Channel Camera Interface Board

LVDS-based PCI Express Frame Grabber board

- PCI Express x1 interface
- Four LVDS input channels
- Serial connector for camera control

→ preliminary

III Main Features

- Frame Grabber board for Multi-Channel LVDS cameras
- Four input channels, up to 220 MByte/s each
- PCI Express x1 interface
- RS-485 interface on-board for camera control
- RAM-based Fifo used as buffer

III Overview Multi-Channel interface technology

The Multi-Channel camera interface has been created to interface high-speed CMOS cameras to computers in a cost-efficient way.

The Multi-Channel interface uses low-cost RJ-45 patch cables for data transfer – the same cables are used for Gigabit Ethernet interfacing. Each cable has four differential pairs capable to transfer up to 700 Mbit/s, resulting in a throughput of 80 Mbyte/s. Three of these channels are used for data transfer and one for clock distribution. The resulting maximum bandwidth per cable is thus 240 MByte/s.

The usable cable length with the Multi-Channel interface is 0.2 ... 15 m.

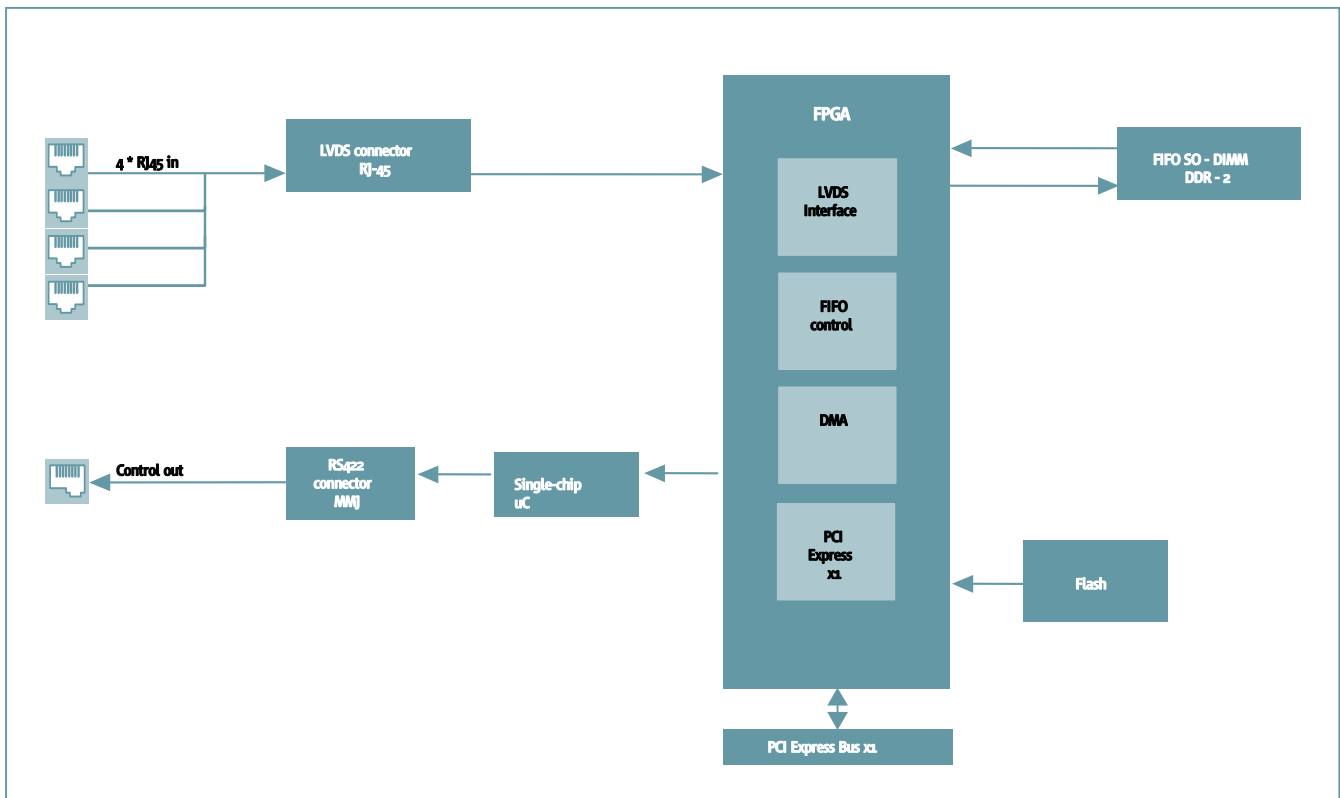
Multi-Channel interface	
Voltage levels	LVDS differential
Data rate (per link)	700 Mbit/s
Pair usage in RJ-45	3 data + 1 clock
Cable length	0.2 ... 15 m
Connector, cable	RJ-45, CAT 5e / CAT 6
Control signals to cameras	RS422 over MMJ
Camera power supply	Over MMJ

III Overview PC_EYE/MCG interface card

The PC_EYE/MCG is an interface board to connect up to four LVDS Multi-Channel cameras to a PCI Express-enabled motherboard. One on-board RS485 interface can be used to control all four cameras. An on-board Fifo buffers data to minimize the risk of video data loss.

III Buffer Memory

The 64-bit wide memory module with 512 Mbyte DDR-2 memory is used as a first-in-first-out (FIFO) memory. It makes sure that video data transfer is not interrupted, even when the PCI Express link is busy for a short time. Of course,



the net transfer capability of the PCI Express interface must be sufficient to handle all camera traffic on the average.

III Interface logic

The complete interface logic of the MCG-1 is located in a single FPGA, containing the LVDS interfaces for camera data, for data buffering in the on-board memory module, and for interfacing to the PCI Express bus.

III Serial I/O

One asynchronous serial channel with up to 1 Mbaud transfer rate and 256-byte FIFOs with RS422 levels are available to interface to the camera control bus. The bus is routed to a front-panel-based MMJ connector, used also for camera power supply (+12 V, 0.5 A max.).

III PCI Express Interface

The PCI Express interface is implemented with a single-lane (x1), using the corresponding connector. It features transfer rates of up to 250 MByte/s (gross). The resulting net transfer rate depends on the motherboard and system load.

The board uses bus mastership (DMA) and one interrupt request line.

III Software Support

ELTEC's standard DLL for frame grabbers is used to interface the user application to the hardware. It is available under Windows (2000, XP, and Vista) and Linux. Support for real-time operating systems, such as VxWorks and OS-9000 is available on request.

III Front-panel I/O

The front-panel bracket has four RJ-45 connectors for cameras and one MMJ connector (similar to RJ-45, but not interchangeable) for the camera control bus.

III Mechanical

The form factor of the MCG-1 is a standard PCI Express card with a x1 (single-lane) connector and a card length of 168 mm.

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III Specifications

PCI Express

- 2.5 Gb/s PCI Express Rev. 1.0
- x1 / single-lane connector

III Environmental Conditions

- Storage Temperature: -40 °C – 70 °C, at 10% - 100% non-condensing
- Operating Temperature: 0 °C – 55 °C (2 m/s forced air cooling). This temperature is measured on the air intake of the PC case
- Maximum Operating Humidity: 85 % relative

III Power Requirements (interface board only)

- 3 A max. 4.8 A typ. at +3.3 VDC ± 5 %
- 100mA max. 30mA typ. at +12 VDC ± 10 %

III MTBF Values

- T.b.d. hrs (computed after MIL HDBK-217F)
- t.b.d. hrs (realistic value from industry standard experience)

III Connectors

Front Panel

- 4 * RJ45 LVDS
- 1 * MMJ RS485

III Regulatory

- CE: EN50082-2, EN50081-1, EN55011

III Documentation

- Hardware / Software – free / internet

Please contact your local sales office for detailed information

III Ordering options

V-MCG.-100: PCIe x1, 4 LVDS inputs

