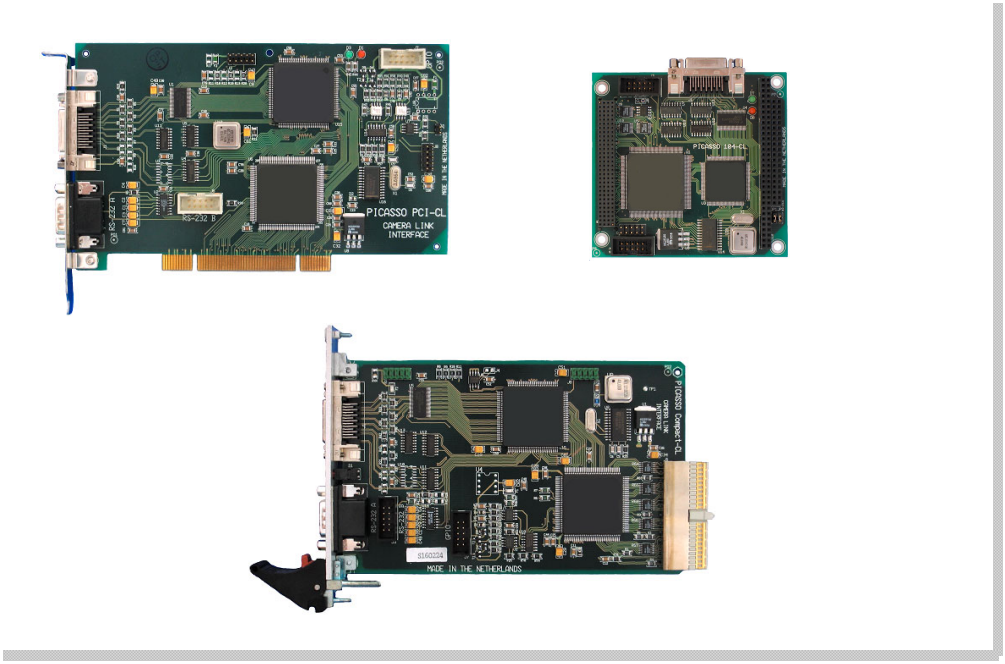
Datasheet picasso™ CL models



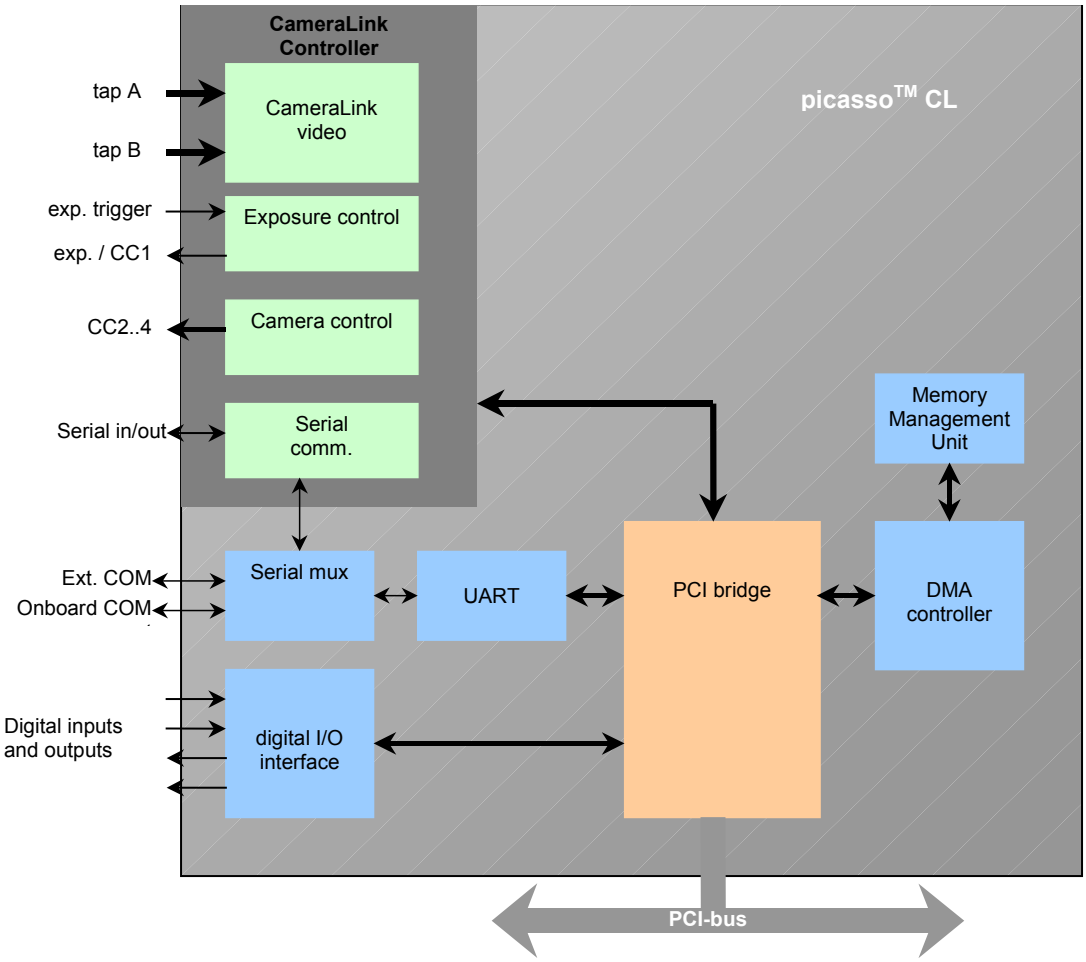
Key features

- digital CameraLink Base-16 interface
- available in 3 form factors:
  - standard PCI
  - Compact PCI
  - PC/104 *plus*
- support 8 to 16 bits data input formats
- sampling rates up to 40 MHz
- image size:
  - up to 4095 pixels/line (up to 8190 pixels/line if 8 bit/pix)
  - 4095 lines/frame
- one or two taps
- programmable exposure time
- supports area and line scan cameras
- on board UART for bidirectional serial camera communication
- two RS-232 full duplex communication channels
- 2 digital inputs (optical isolated) for e.g.
  - start capture
  - interrupt generation
- 2 digital outputs (optical isolated) for e.g.
  - trigger stroboscoop
  - process control
- software support for several (real time) operating systems

General

With the picasso™ CL high speed digital video acquisition is possible. The picasso™ CL framegrabbers are 'plug and play' PC-cards for the PCI-bus and provide high-resolution image capture for digital video cameras. It enables each standard PCI system to capture and store single images for image processing or full frame display of digital video in a window. The CL models operate as PCI-bus master and transfer images directly to the system memory without impacting the processor.

Architecture



Detailed Information

Video Inputs

The picasso™ CL-models accept video sources compliant with CameraLink video standard from area scan and line scan cameras. The image resolution is up to 8190 pixels x 4095 lines in 8 bit/pixel mode. In other modes the resolution is 4095 pixels x 4095 lines.
The picasso™ accepts 8, 10, 12, 14 or 16 bits single channel cameras or 8 bit dual channel cameras (two tap camera).

Camera Control Signals

The framegrabber has four CameraLink Control signals (CC1..CC4). These outputs are software controlled. CC1 is used for camera exposure.

Exposure

The exposure output on the CameraLink-connector can be used in two ways:
1. Software triggered
2. Hardware triggered

1 Software triggered exposure
Under software control an exposure signal to the camera is generated. The exposure time is programmable between 6.375 µs and 417ms. The signal can be low or high active (software selectable).

2 Hardware triggered exposure
For the hardware trigger mode you should use the exposure header. In this mode the TTL compatible trigger signal is connected to the exposure input.

The CameraLink exposure output depends on software controlled settings:
- Exposure output follows input
- Exposure output is inverted input
- Exposure output is triggered by a falling or rising edge of the input and will be active for the 'exposure time'. The exposure time is software adjustable between 6.375 µs and 417 ms.

Exposure-time: Refers to the period during which the image sensor of a camera is exposed to the light. As the length of this period increases, the image illumination will raise.

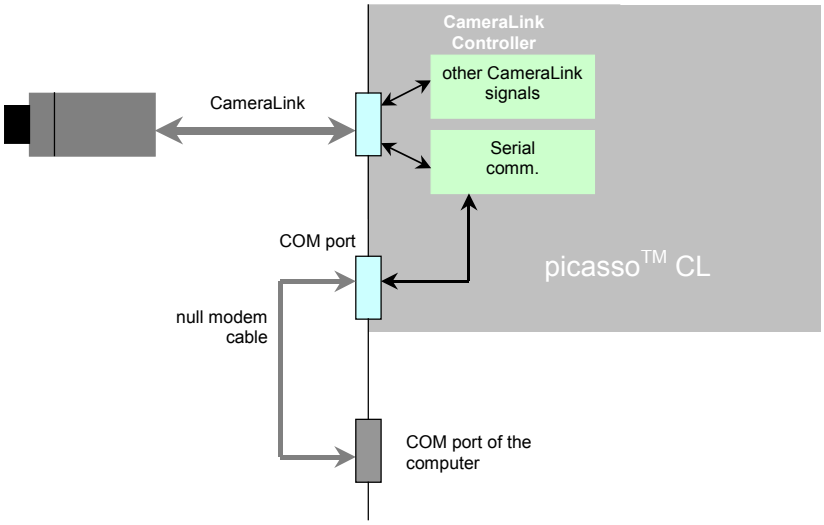
RS-232 - CameraLink

Most CameraLink cameras are controlled by RS-232 via the CameraLink signals. The picasso™ CL-models can interface RS-232 signals to the CameraLink signals.
There are two modes:
1. use the COM-port of the framegrabber to communicate with the camera
2. use the on board UART to communicate with the camera

1 RS-232 via COM-port

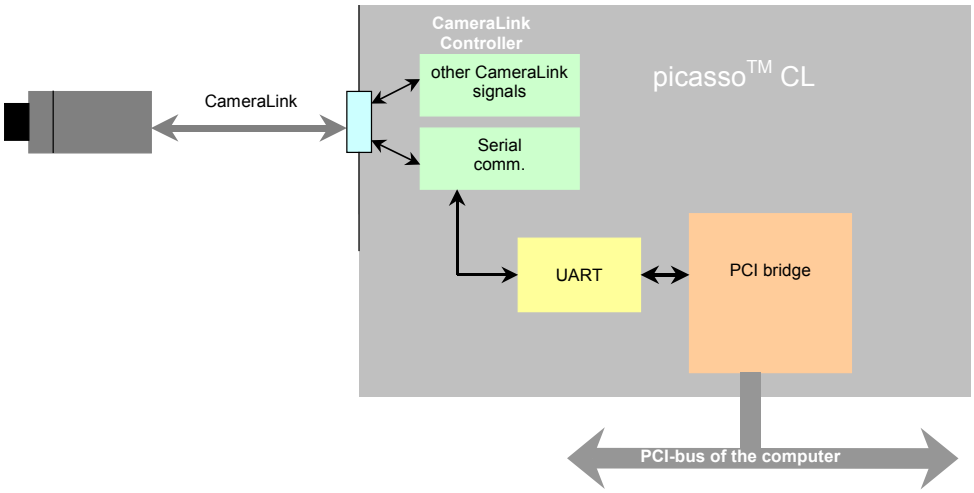
All RS-232 data transmitted to the COM port of the picasso™ will be converted to CameraLink signals and will be transmitted to the camera. This data path is bidirectional, so CameraLink data from the camera are converted to RS-232 signals, which are transmitted to the framegrabbers COM port.

In the figure below, the RS-232 signal comes from the COM-port of the host (computer).



2 RS-232 by the on board UART

The serial data to the camera is controlled by an on board UART. This UART is software controlled. Data can be written to the camera by calling the UART's write function. The data will be converted to CameraLink signals and transmitted to the camera. Data from the camera can be read by calling the UART's read function.



Technical Specifications

picasso™ CL models			
	standard PCI	Compact PCI	PC/104 plus
PCI Bus	PCI 2.1	Compact PCI 2.0 32-bit PCI interface PCI bus master up to 132 Mbytes/sec. Supports zero wait state burst transfers Plug and play no jumpers on PCI and Compact PCI	PC/104plus 1.0 3.3V or 5V
Video input	CameraLink Base-16		
taps	one ore two taps		
Pixel formats	one tap: 8..16 bits two taps: 2 x 8 bits		
Image resolution	4095 pixels per line (8190 pixel per line if 8 bit/pixel) 4095 lines per frame		
Pixel clock	up to 40 MHz		
Capture format	Y8 Y16 RGB24 for color camera's with Bayer filter *post processing required*		
Exposure timer	programmable between 6.375 µs and 417 ms (step is 6.375 µs)		
Exposure input trigger	TTL signal		
CameraLink output Control signals	CC1, CC2, CC3 and CC4 CC1 is used for exposure		
Digital I/O	2 digital inputs 2 digital outputs TTL compatible inputs can be programmed as interrupt or as capture start optical isolated 5V, 100mA, 10kHz		5V, 10mA
CameraLink Connector	MDR 26-pin female		
RS-232 connectors	channel 1: 10-pins header on PCB channel 2: SUB-D9 on the bracket		one channel: 10-pins header on PCB
Digital I/O connector	10-pins header on PCB		Digital I/O and Exposure are on one 10-pins header
Exposure input connector	10-pins header on PCB		
Dimensions (mm)	106 x 175	100 x 160 3U Eurocard	90 x 96
Power consumption	5.75 W typical		
Operating temperature	0^0 C to 55^0 C		
Operating Systems	Windows 98/ Me/ NT/ 2000/ XP Linux Solaris 8 (x86 and SPARC)		
RT Operating Systems	RTLinux, QNX4 and QNX6		
Software	Windows: Visual C++, Borland C (ANSI C compilers) Visual Basic, Delphi Linux, Solaris and QNX6: (GNU) C compiler QNX4: Watcom C compiler		

Options

Software

Windows Software Development Kit (98/Me/NT/2000/XP)
Linux Software Development Kit
Realtime Linux Software Development Kit
Solaris 8 (SPARC) Software Development Kit
Solaris 8 (i86) Software Development Kit
QNX4 Software Development Kit
QNX6 (x86) Software Development Kit

Cable sets

CameraLink cable, 1 meter
CameraLink cable, 2 meter

Hardware modification

PC-104 stack through connector (PC/104 *plus* model only)