

Matrox Helios eCL/XCL

Camera Interface Application Note

JAI CV-M7+CL

September 19, 2006

Basics about the
camera

Mode of operations as
per Matrox Imaging (in
parentheses as per
camera manufacturer)

Basics about the
interface modes

Camera Descriptions

- Effective resolution: $1380 \times 1030 \times 10\text{-bit}$ @ 28 fps (full scanning).
- Camera Link BASE interface (Single tap).
- Color progressive scan.
- Internal sync.
- Internal or external exposure control.
- 40.49 MHz pixel clock rate.

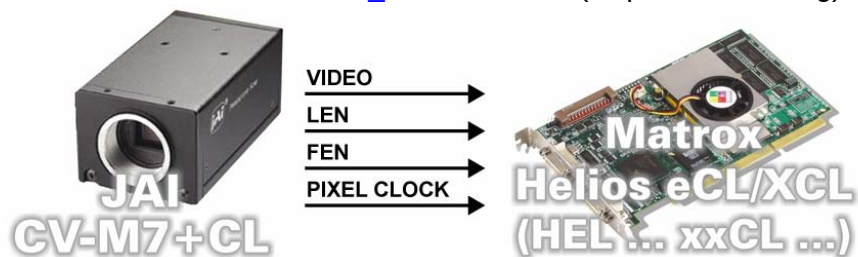
Interface Mode

- Continuous
- Asynchronous reset (Pulse width controlled)

Camera Interface Briefs

Mode 1: Continuous

- $1380 \times 1030 \times 10\text{-bit}$ @ 24 fps (full scanning).
- Camera Link BASE interface (Single tap).
- Matrox Helios eCL/XCL receiving LEN, FEN, PIXEL CLOCK and video signal from camera.
- DCF used: [CVM7CL1380x1030_10bitCon.DCF](#) (full scanning)
- DCF used: [CVM7CL1380x515_10bitCon.DCF](#) (horizontal, vertical binning)
- DCF used: [CVM7CL1380x512_10bitCon.DCF](#) ($\frac{1}{2}$ partial scanning)
- DCF used: [CVM7CL1380x256_10bitCon.DCF](#) ($\frac{1}{4}$ partial scanning)
- DCF used: [CVM7CL1380x128_10bitCon.DCF](#) ($\frac{1}{8}$ partial scanning)



Mode 2: Asynchronous reset

- $1380 \times 1030 \times 10\text{-bit}$ (full scanning).
- Camera Link BASE interface (Single tap).
- Matrox Helios eCL/XCL receiving external trigger signal.
- Matrox Helios eCL/XCL sending EXPOSURE1 (CC1) signal to camera to initiate and control exposure time.
- Matrox Helios eCL/XCL receiving LEN, FEN, PIXEL CLOCK and video signal from camera.

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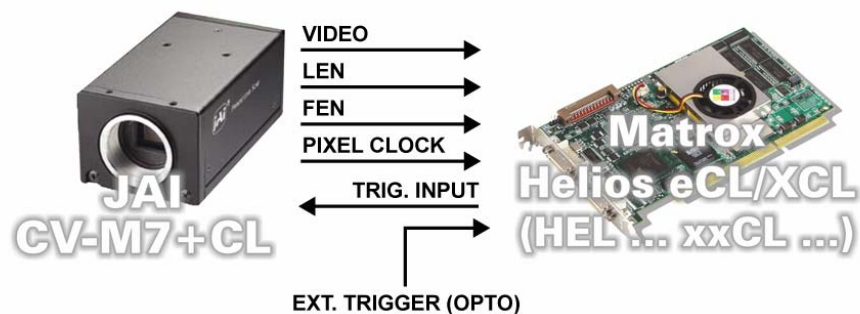
September 19, 2006

Basics about the
interface modes

Camera Interface Briefs (cont.)

Mode 2: Asynchronous reset

- DCF used: [CVM7CL1380x1030_10bitCon.DCF](#) (full scanning)
- DCF used: [CVM7CL1380x515_10bitCon.DCF](#) (horizontal, vertical binning)
- DCF used: [CVM7CL1380x512_10bitCon.DCF](#) ($\frac{1}{2}$ partial scanning)
- DCF used: [CVM7CL1380x256_10bitCon.DCF](#) ($\frac{1}{4}$ partial scanning)
- DCF used: [CVM7CL1380x128_10bitCon.DCF](#) ($\frac{1}{8}$ partial scanning)



Specifics about the
interface modes

Camera Interface Details

Mode 1: Continuous

- **Frame Rate:** Matrox Helios eCL/XCL receives the continuous video from the camera at 24 (full scanning) or up to 102 fps (partial scanning). The frame rate depends on the number of scanned lines. Refer to the camera manual for additional information.
- **Camera switch settings:** Refer to the camera manual for additional information. Internal and external switch settings should be set as follows:

External switch (SW1)				
DCF	SW 1 - 6	SW 7	SW 8	SW 9-10
CVM7CL1380x1030_10bitCon.DCF	OFF	OFF	OFF	OFF
CVM7CL1380x515_10bitCon.DCF	OFF	OFF	OFF	OFF
CVM7CL1380x512_10bitCon.DCF	OFF	OFF	ON	OFF
CVM7CL1380x256_10bitCon.DCF	OFF	ON	OFF	OFF
CVM7CL1380x128_10bitCon.DCF	OFF	ON	ON	OFF

Continued...

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Specifics about
the interface
modes

Camera Interface Details (continued)

Mode 1: Continuous

Camera settings:

Internal switch (SW301)						
DCF	SW 1	SW 2	SW 3 - 4	SW 5	SW 6	SW 7 - 8
CVM7CL1380x1030_10bitCon.DCF	OFF	ON	OFF	OFF	OFF	OFF
CVM7CL1380x515_10bitCon.DCF	OFF	ON	OFF	ON	ON	OFF
CVM7CL1380x512_10bitCon.DCF	OFF	ON	OFF	OFF	OFF	OFF
CVM7CL1380x256_10bitCon.DCF	OFF	ON	OFF	OFF	OFF	OFF
CVM7CL1380x128_10bitCon.DCF	OFF	ON	OFF	OFF	OFF	OFF

Mode 2: Asynchronous reset

- **Frame Rate:** The frame rate is determined by the frequency of the external trigger signal and the exposure time period.
- **Exposure time:** The width (falling edge to rising edge) of the EXPOSURE1 (CC1) signal is the exposure time. The exposure time can be modified in the DCF using Matrox Intellicam or with the MIL MdigControl() function. Consult the respective manual for more information.
- **Camera switch settings:** Refer to the camera manual for additional information. Internal and external switch settings should be set as follows:

External switch (SW1)						
DCF	SW 1 - 4	SW 5	SW 6	SW 7	SW 8	SW 9-10
CVM7CL1380x1030_10bitCon.DCF	OFF	ON	OFF	OFF	OFF	OFF
CVM7CL1380x515_10bitCon.DCF	OFF	ON	OFF	OFF	OFF	OFF
CVM7CL1380x512_10bitCon.DCF	OFF	ON	OFF	OFF	ON	OFF
CVM7CL1380x256_10bitCon.DCF	OFF	ON	OFF	ON	OFF	OFF
CVM7CL1380x128_10bitCon.DCF	OFF	ON	OFF	ON	ON	OFF

Internal switch (SW301)						
DCF	SW 1	SW 2	SW 3 - 4	SW 5	SW 6	SW 7 - 8
CVM7CL1380x1030_10bitCon.DCF	OFF	ON	OFF	OFF	OFF	OFF
CVM7CL1380x515_10bitCon.DCF	OFF	ON	OFF	ON	ON	OFF
CVM7CL1380x512_10bitCon.DCF	OFF	ON	OFF	OFF	OFF	OFF
CVM7CL1380x256_10bitCon.DCF	OFF	ON	OFF	OFF	OFF	OFF
CVM7CL1380x128_10bitCon.DCF	OFF	ON	OFF	OFF	OFF	OFF

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Cabling details for the
interface modes

Cabling Requirements

Mode 1: Continuous

- **Cable and Connection:** Standard Camera Link cable.

Mode 2: Asynchronous reset

- **Cable and Connection:** Standard Camera Link.
- **External trigger:** External trigger should be connected to the OPTO TRIG input of the 9-pin connector (pins 7 and 2) on the External auxiliary I/O connector 1 adapter board.

EXPANDED I/O BRACKET

(9-pin connector)

		External Trigger Source	
OPTOTRIG +	07	←	SIGNAL --
OPTOTRIG -	02	←	GROUND --

The DCFs mentioned in this application note are also attached (embedded) to this PDF file – use the Adobe Reader's View File Attachment to access the DCF files. The information furnished by Matrox Electronics System, Ltd. is believed to be accurate and reliable. Please verify all interface connections with camera documentation or manual. Contact your local sales representative or Matrox Sales office or Matrox Imaging Applications at 514-822-6061 for assistance. © Matrox Electronic Systems Ltd, 2006-2011.

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