

Matrox Helios eCL/XCL

Camera Interface Application Note

JAI CV-M9CL

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: $1034 \times 779 \times 10\text{-bit}$ @ 30 fps.
- Camera Link MEDIUM interface (RGB - three tap).
- Progressive scan.
- Internal sync.
- Internal or external exposure control.
- 33.75 MHz pixel clock rate.

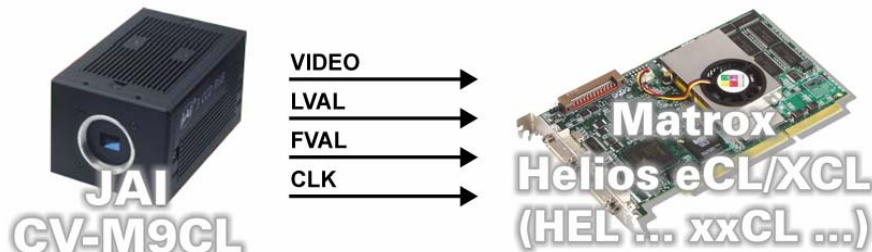
Interface Modes

- Continuous (Normal continuous)
- Pseudo-continuous (Pulse Width Control)
- Asynchronous reset (Pulse Width Control)

Camera Interface Briefs

Mode 1: Continuous

- $1034 \times 779 \times 10\text{-bit}$ @ 30 fps.
- Camera Link MEDIUM interface (RGB - three tap).
- Matrox Helios eCL/XCL receiving LVAL, FVAL, PIXEL CLOCK (CLK @ 33.75 MHz) and video signals from camera.
- DCF: [CVM9CL1034x779_10bit3tapRGB_Con.DCF](#)



Mode 2: Pseudo-continuous

- $1034 \times 779 \times 10\text{-bit}$.
- Camera Link MEDIUM interface (RGB - three tap).
- Matrox Helios eCL/XCL sending periodic EXPOSURE1 (CC1) signal to camera to initiate and control exposure time.
- Matrox Helios eCL/XCL receiving LVAL, FVAL, PIXEL CLOCK (CLK @ 33.75 MHz) and video signals from camera.
- DCF: [CVM9CL1034x779_10bit3tapRGB_Pcon.DCF](#)

Continued...

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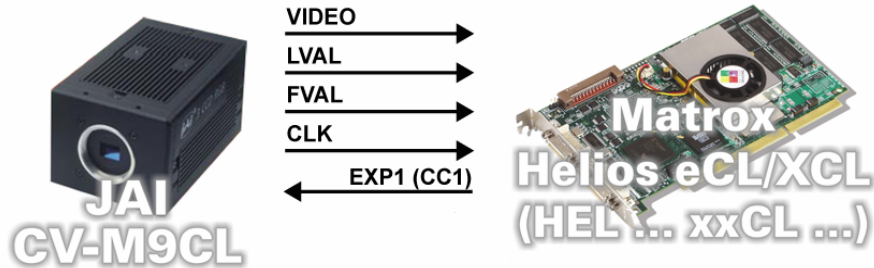
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Basics about the
interface modes

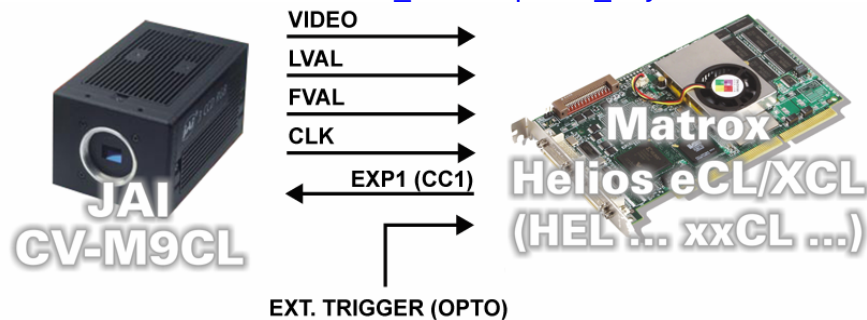
Camera Interface Briefs (continued)

Mode 2: Pseudo-continuous



Mode 3: Asynchronous reset

- 1034 × 779 × 10-bit.
- Camera Link MEDIUM interface (RGB - three tap).
- Progressive scan.
- Matrox Helios eCL/XCL receiving external OPTO trigger signal.
- Matrox Helios eCL/XCL sending EXPOSURE1 (CC1) signal to camera to initiate and control exposure time.
- Matrox Helios eCL/XCL receiving LVAL, FVAL, PIXEL CLOCK (CLK @ 33.75 MHz) and video signals from camera.
- DCF used: [CVM9CL1034x779_10bit3tapRGB_Async.DCF](#)



Specifics about the
interface modes

Camera Interface Details

Mode 1: Continuous

- **Frame Rate:** With this DCF, the Matrox Helios eCL/XCL receives the continuous video from the camera at 30 frames per second.
- **Exposure time:** Exposure time is determined by the shutter setting. Refer to the camera manual for more information.
- **Camera Control:** The camera functions are set to the default settings using the Windows HyperTerminal utility. Refer to the camera manual for the command descriptions.

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Specifics about the
interface modes

Camera Interface Details (cont.)

Mode 2: Pseudo-continuous

- **Frame Rate:** With this DCF, the Matrox Helios eCL/XCL receives the pseudo-continuous video from the camera. Frame rate is controlled by the frequency of the EXPOSURE1 (CC1) signal.
- **Exposure time:** The width (falling edge to rising edge) of the EXPOSURE1 (CC1) signal is the exposure time. To modify the exposure time, change the **active** duration of Timer1 in Matrox Intellicam or with the MIL MdigControl() function. It is recommended that the **inactive** period of Timer1 be set to greater than one frame duration. Furthermore, any increase or decrease to the exposure time will respectively decrease or increase the frame rate.
- **Camera Control:** The camera mode is set using the Windows HyperTerminal utility. Refer to the camera manual for the command descriptions.

Mode	Setting
Trigger mode = Pulse width control mode	TR = 2
Accumulation LVAL = a-synchronous	LS = 1

Mode 3: Asynchronous Reset

- **Frame rate:** The frame rate is determined by the frequency of the external trigger signal. The period between external trigger signals must be larger than the total duration of the exposure time (pulse period of Timer1) plus the time for one frame.
- **Exposure time:** The width (falling edge to rising edge) of the EXPOSURE1 (CC1) signal is the exposure time. To modify the exposure time, change the pulse duration of Timer1 in Matrox Intellicam or with the MIL MdigControl() function. Refer to the respective manual for more information.
- **Camera Control:** The camera mode is set using the Windows HyperTerminal utility. Refer to the camera manual for the command descriptions.

Mode	Setting
Trigger mode = Pulse width control mode	TR = 2
Accumulation LVAL = a-synchronous	LS = 1

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Cabling details for the
interface modes

Cabling Requirements

Mode 1 and 2: Continuous and Pseudo-continuous

- **Cable and Connection:** Two standard Camera Link cables.

Mode 3: Asynchronous reset

- **Cable and Connection:** Two standard Camera Link cables.
- **External trigger:** External trigger should be connected to the OPTO TRIG input of the 9-pin connector (pins 7 and 2) on the Expanded I/O adapter bracket.

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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