

Matrox Helios eCL/XCL

Camera Interface Application Note

Photonfocus MV-D640C-66-CL-10

October 19, 2006

*Basics about the
camera*

Camera Descriptions

- Effective resolution: $640 \times 480 \times 10\text{-bit}$ @ 200 fps.
- Camera Link BASE interface (10-bit, dual tap).
- Bayer Color Filter.
- Progressive scan.
- Internal sync.
- Internal exposure control.
- 66 MHz pixel clock rate.

Interface Mode

- Continuous (Free Running)
- Pseudo-continuous (Trigger)
- Asynchronous reset (Trigger)

Camera Interface Briefs

Mode 1: Continuous

- $640 \times 480 \times 10\text{-bit}$ @ 200 fps.
- Camera Link BASE interface (10-bit, dual tap).
- Matrox Helios eCL/XCL receiving LVAL, FVAL, PIXEL CLOCK (CLK @ 66 MHz) and video from camera.
- DCF used: [MVD640C_640x480_10bitCon.DCF](#)



VIDEO
LVAL
FVAL
CLK



Mode 2: Pseudo-continuous

- $640 \times 480 \times 10\text{-bit}$.
- Camera Link BASE interface (10-bit, dual tap).
- Matrox Helios eCL/XCL sending EXPOSURE1 (CC1) signal to camera to initiate the exposure.
- Matrox Helios eCL/XCL receiving LVAL, FVAL, PIXEL CLOCK (CLK @ 66 MHz) and video from camera.

Continued...

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

*Basics about the
interface modes*

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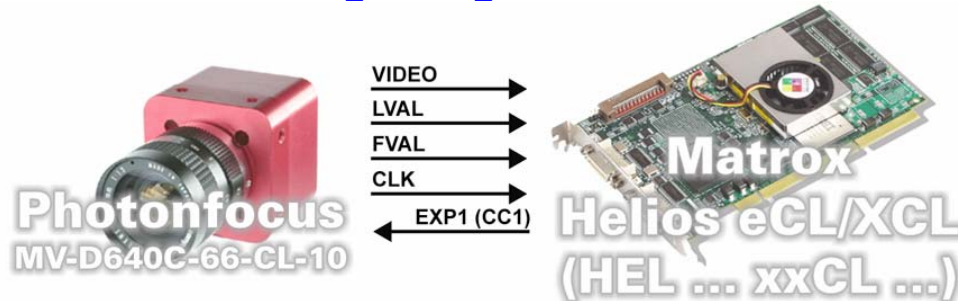
October 19, 2006

Basics about the
interface modes

Camera Interface Briefs (cont.)

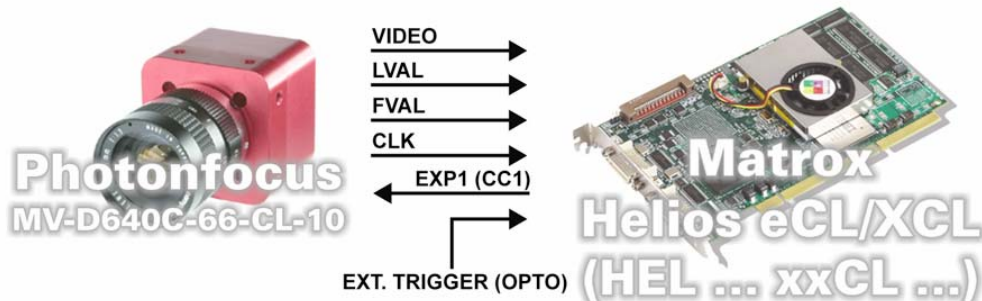
Mode 2: Pseudo-continuous

- DCF used: [MVD640C_640x480_10bitPcon.DCF](#)



Mode 3: Asynchronous reset

- 640 × 480 × 10-bit.
- Camera Link BASE interface (10-bit, dual tap).
- Matrox Helios eCL/XCL receiving external trigger signal.
- Matrox Helios eCL/XCL sending EXPOSURE1 (CC1) signal to camera to initiate the exposure.
- Matrox Helios eCL/XCL receiving LDV, FDV, CLK and video from camera.
- DCF used: [MVD640C_640x480_10bitAsync.DCF](#)



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 200 frames per second. To increase the frame rate, reduce exposure time in the PhotonFocus PFRemote Camera Configuration utility (PFRemote.EXE).
- **Exposure time:** Exposure time is determined by the **Exposure Time Field** setting in the PFRemote utility. Refer to the camera manual for more information.

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Specifics about the
interface modes

Camera Interface Details

Mode 1: Continuous

- **Bayer Color Filter:** Color information is generated by a Bayer color mosaic filter mounted on the sensor. RGB information can only be obtained through software-based conversion. Following each frame capture it will be necessary to make a call to your MIL/MIL-Lite program in order to reconstruct the proper color image. This will require processing time by the host computer, which may reduce the effective acquisition rate. For more information, contact your local Sales representative or Matrox Imaging Technical Support.
- **Camera settings:** The camera mode is set to the following setting in the PFRemote utility. Refer to the camera manual for more information.

Mode	Setting
Trigger	Free Running
Output	10-bit
Special clock	FAST 66 MHz

Mode 2: Pseudo-continuous

- **Frame rate:** The frame rate is determined by the frequency of the EXPOSURE1 (CC1) signal.
- **Exposure time:** The rising edge of the EXPOSURE1 (CC1) signal initiates the camera's internal exposure time. To modify the exposure time, change the **Exposure Time Field** setting in the PFRemote utility. Refer to the camera manual for more information.
- **Bayer Color Filter:** Refer to Mode 1: Continuous
- **Camera settings:** The camera mode is set to the following setting in the PFRemote utility. Refer to the camera manual for more information.

Mode	Setting
Trigger	External Trigger
Output	10-bit
Special clock	FAST 66 MHz

Mode 3: Asynchronous

- **Frame rate:** The frame rate is determined by the frequency of the external trigger signal. The period between the external trigger signals must be larger than the frame readout period and the exposure time.
- **Exposure time:** The rising edge of the EXPOSURE1 (CC1) signal initiates the camera's internal exposure time. To modify the exposure time, change the **Exposure Time Field** setting in the PFRemote utility. Refer to the camera manual for more information.
- **Bayer Color Filter:** Refer to Mode 1: Continuous.
- **Camera settings:** Refer to Mode 2: Pseudo-continuous.

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Cabling details for the
interface modes

Cabling Requirements

Mode 1 and 2: Continuous and Pseudo-continuous

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

Mode 3: 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 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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