

Matrox Helios eCL/XCL

Camera Interface Application Note

Photonfocus HURRICANE-40-CL October 3, 2006

Basics about the camera

Camera Descriptions

- Effective Resolution: $1024 \times 1024 \times 12\text{-bit}$ @ 37 fps.
- Camera Link BASE interface (12-bit).
- Progressive scan.
- Internal sync.
- Internal or external exposure control.
- 40 MHz pixel clock rate.

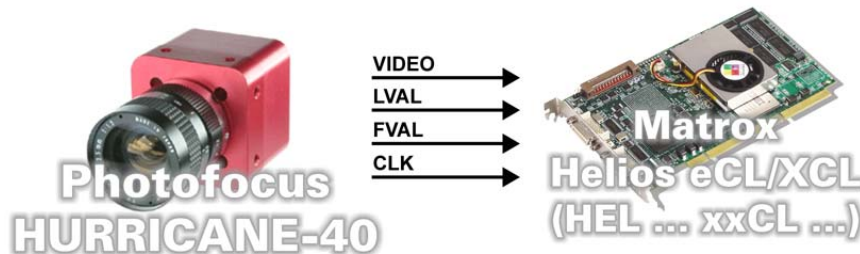
Interface Modes

- Continuous
- Pseudo-continuous (Trigger Pulse Width)
- Asynchronous reset (Trigger Pulse Width)

Camera Interface Briefs

Mode 1: Continuous

- $1024 \times 1024 \times 12\text{-bit}$ @ 37 fps.
- Camera Link BASE interface (12-bit).
- Matrox Helios eCL/XCL receiving LVAL, FVAL, PIXEL CLOCK (CLK @ 40 MHz) and video signals from camera.
- DCF: [HURRICANE40_1024x1024_12bit1tapCon.DCF](#)



Mode 2: Pseudo-continuous

- $1024 \times 1024 \times 12\text{-bit}$.
- Camera Link BASE interface (12-bit).
- 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 @ 40 MHz) and video signals from camera.
- DCF: [HURRICANE40_1024x1024_12bit1tapPcon.DCF](#)

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

Basics about the interface modes

Matrox Helios eCL/XCL

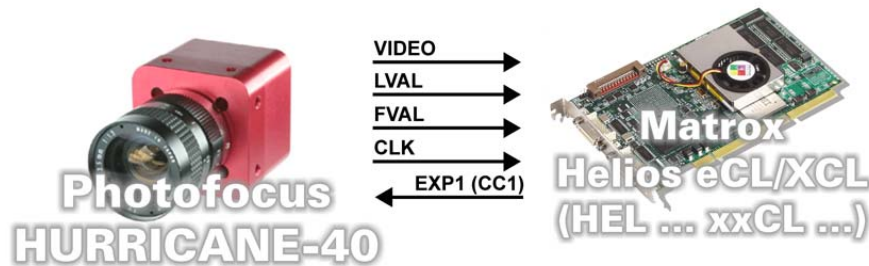
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Basics about the
interface modes

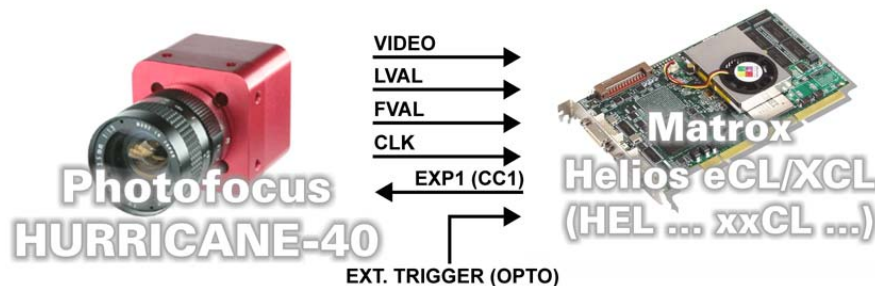
Camera Interface Briefs (continued)

Mode 2: Pseudo-continuous



Mode 3: Asynchronous reset

- 1024 × 1024 × 12-bit.
- Camera Link BASE interface (12-bit).
- 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 @ 40 MHz) and video signals from camera.
- DCF used: [HURRICANE40_1024x1024_12bit1tapAsync.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 37 frames per second.
- **Exposure time:** Exposure time is determined by the shutter setting. Refer to the camera manual for more information.

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*Specifics about the
interface modes*

Camera Interface Details (cont.)

Mode 1: Continuous

- **Camera Control:** Set the camera mode to **Free Run** and set the resolution to **12-bits** using the PFRemote utility. Refer to the camera manual for the command descriptions.

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 (rising edge to falling 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 total period (**active** and **inactive**) 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:** Set the camera mode to **Trigger Pulse Width** and set the resolution to **12-bits** using the PFRemote utility. Refer to the camera manual for the command descriptions.

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 one frame.
- **Exposure time:** The width (rising edge to falling 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:** Set the camera mode to **Trigger Pulse Width** and set the resolution to **12-bits** using the PFRemote utility. Refer to the camera manual for the command descriptions.

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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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