

Matrox Helios eCL/XCL

Camera Interface Application Note

REDLAKE MASD ES-2020C

May 1, 2007

Basics about the
camera

Camera Descriptions

- Effective resolution: $1600 \times 1200 \times 12\text{-bit}$ @ 30 fps.
- Camera Link BASE interface (Single tap).
- Bayer Color Filter.
- Progressive scan.
- Internal sync.
- External or internal exposure control.
- 38 MHz pixel clock rate.

Interface Mode

- Continuous (Free run)
- Pseudo-continuous (Level controlled trigger mode)
- Asynchronous reset (Level controlled trigger mode)

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

Camera Interface Briefs

Mode 1: Continuous

- $1600 \times 1200 \times 12\text{-bit}$ @ 30 fps.
- Camera Link BASE interface (Single tap).
- Progressive scan.
- Matrox Helios eCL/XCL receiving LVAL, FVAL, PCLK and video from camera.
- DCF used: [ES2020C_1600x1200_12bitBayerCon.DCF](#)



Mode 2: Pseudo-Continuous

- $1600 \times 1200 \times 12\text{-bit}$ @ 30 fps.
- Camera Link BASE interface (Single tap).
- Progressive scan.
- Matrox Helios eCL/XCL sending TIMER1 OUT (CC1) signal to camera to initiate and control the exposure.
- Matrox Helios eCL/XCL receiving LVAL, FVAL, PCLK and video from camera.
- DCF used: [ES2020C_1600x1200_12bitBayerPcon.DCF](#)

Continued...

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Camera Interface Application Note

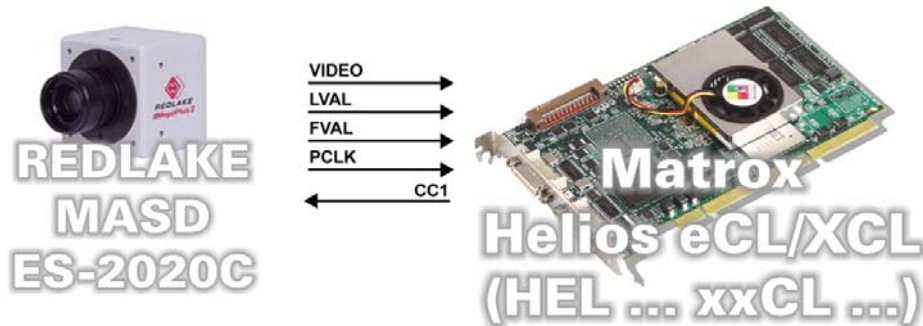
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Basics about the
interface modes

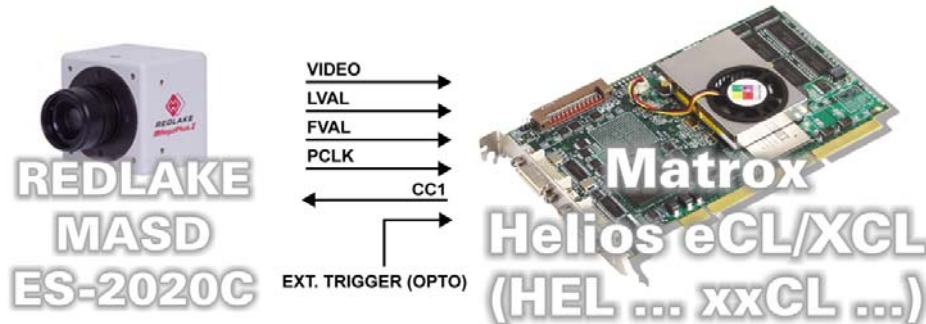
Camera Interface Briefs (cont.)

Mode 2: Pseudo-Continuous



Mode 3: Asynchronous reset

- 1600 × 1200 × 12-bit.
- Camera Link BASE interface (Single tap).
- Progressive scan.
- Matrox Helios eCL/XCL receiving external trigger signal.
- Matrox Helios eCL/XCL sending TIMER1 OUT (CC1) signal to camera to initiate and control the exposure.
- Matrox Helios eCL/XCL receiving LVAL, FVAL, PCLK and video from camera.
- DCF used: [ES2020C_1600x1200_12bitBayerAsync.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 30 frames per second.
- **Exposure time:** Exposure time is set using the shutter speed setting in the Camera Configuration Utility. Refer to the camera manual for more information.

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Specifics about the
interface modes

Camera Interface Details (cont.)

Mode 1: Continuous

- **Bayer Color Filter:** Color information is generated by a Bayer color mosaic filter mounted on the sensor. Refer to the MIL online Help for information on using buffers with the Bayer color filter.
- **Camera control settings:** Using the MegaPlus II Central software, set the camera controls as follows:

Control	Setting
Output Data / Bit Depth	12 Bits
Mode selection	Trigger off – Free run

Mode 2: Pseudo-Continuous

- **Frame rate:** The frame rate is determined by the frequency of the TIMER1 OUT (CC1) signal.
- **Exposure time:** The width (falling to rising edge) of the TIMER1 OUT (CC1) signal is the exposure time, which can be modified in the DCF using Matrox Intellicam or with the MIL MdigControl() function. Consult the respective manual for more information.
- **Bayer Color Filter:** Refer to Mode 1: Continuous.
- **Camera control settings:** Using the MegaPlus II Central software via the Helios Virtual COM port, set the camera controls as follows:

Control	Setting
Output Data / Bit Depth	12 Bits
Mode selection	Level controlled trigger mode
Polarity	Negative

Mode 3: Asynchronous Reset

- **Frame rate:** The frame rate is determined by the frequency of the external trigger signal.
- **Exposure time:** Refer to Mode 2: Pseudo-Continuous.
- **Bayer Color Filter:** Refer to Mode 1: Continuous.
- **Camera Configuration:** Refer to Mode 2: Pseudo-Continuous.

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Cabling details for the
interface modes

Cabling details for the
interface modes

Cabling Requirements

Modes 1 and 2: Continuous, Pseudo-continuous

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

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	←	LINE SIGNAL	--
OPTOTRIG -	02	←	LINE 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, 2007-2011.

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