

Matrox Odyssey eCL/XCL

Camera Interface Application Note

TOSHIBA TELI CS3960DCL

October 20, 2006

Basics about the
camera

Camera Descriptions

- Effective resolution: $1392 \times 1040 \times 12\text{-bit}$ @ 30 fps.
- Camera Link BASE interface.
- Progressive scan.
- Internal sync.
- Internal or external exposure control.
- 57.28 MHz pixel clock rate.

Interface Mode

- Continuous
- Pseudo-continuous
- Asynchronous reset (Random Trigger Shutter, Pulse Width mode)

Camera Interface Briefs

Mode 1: Continuous

- Up to $1392 \times 1040 \times 12\text{-bit}$ @ 30 fps.
- Camera Link BASE interface.
- Progressive scan.
- Matrox Odyssey eCL/XCL receiving LVAL, FVAL, CLK and video from camera.
- DCF used: [CS3960DCL1392x1040_12bitCon.DCF](#)



Mode 2: Pseudo-continuous

- Up to $1392 \times 1040 \times 12\text{-bit}$.
- Camera Link BASE interface.
- Progressive scan.
- Matrox Odyssey eCL/XCL sending TIMER1 (CC1) signal to camera to initiate and control exposure time.
- Matrox Odyssey eCL/XCL receiving LVAL, FVAL, CLK and video signal from camera.
- DCF used: [CS3960DCL1392x1040_12bitPcon.DCF](#)

Continued...

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

Basics about the
interface modes

Matrox Odyssey eCL/XCL

Camera Interface Application Note

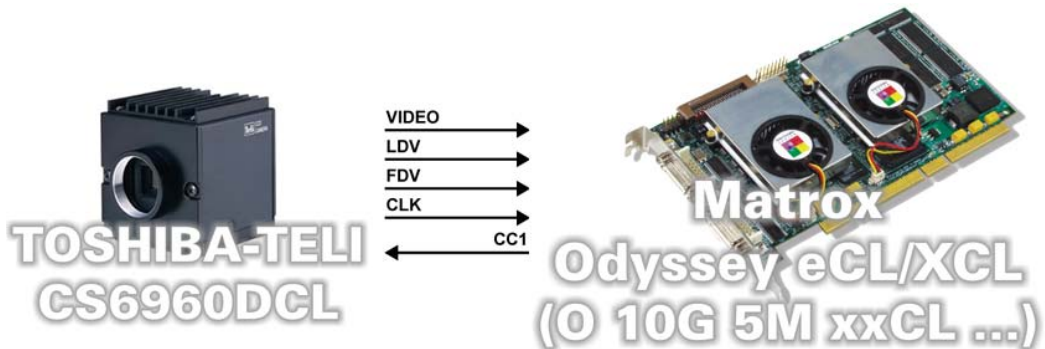
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Basics about the
interface modes

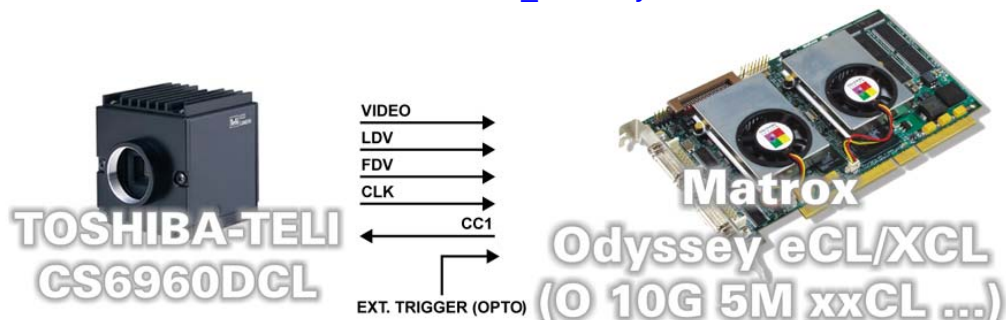
Camera Interface Briefs (cont.)

Mode 2: Pseudo-continuous



Mode 3: Asynchronous reset

- Up to $1392 \times 1040 \times 12$ -bit.
- Camera Link BASE interface.
- Progressive scan.
- Matrox Odyssey eCL/XCL receiving external trigger signal.
- Matrox Odyssey eCL/XCL sending TIMER1 (CC1) signal to camera to initiate and control exposure time.
- Matrox Odyssey eCL/XCL receiving LVAL, FVAL, CLK and video signal from camera.
- DCF used: [CS3960DCL1392x1040_12bitAsync.DCF](#)



Specifics about the
interface modes

Camera Interface Details

Mode 1: Continuous

- **Frame Rate:** Matrox Odyssey eCL/XCL receives the continuous video from the camera at **30** frames per second (full resolution).
- **Exposure time:** Exposure time is determined by the camera 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 settings:** Set the camera mode to **Free Run** (default) by writing the following registers in the TOSHIBA-TELI Register Controller utility. Refer to the camera manual for command descriptions.

Registers					
0x66 = 0	0x6A = 0	0x70 = 0	0x81 = 0	0x90 = 0	0x6E = 1

Mode 2: Pseudo-continuous

- **Frame Rate:** 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, ONL imCamControl() or imDigControl() function or with the MIL MdigControl() function. It is recommended that the total period (**active** and **inactive**) of Timer1 be set to greater than the frame readout and exposure 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 **Pulse Width** by writing the following registers in the TOSHIBA-TELI Register Controller utility. Refer to the camera manual for command descriptions.

Registers						
0x66 = 0	0x6A = 3	0x6B = 1	0x70 = 0	0x81 = 0	0x90 = 0	0x6E = 1

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 (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, ONL imCamControl() or imDigControl() function or with the MIL MdigControl() function. It is recommended that the total period (**active** and **inactive**) of Timer1 be set to greater than the frame readout and exposure duration. Furthermore, any increase or decrease to the exposure time will respectively decrease or increase the frame rate.
- **Camera settings:** Refer to Mode 2: Pseudo-continuous.

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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 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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