

Matrox Solios eCL/XCL

Camera Interface Application Note

TOSHIBA-TELI CS6940CL

October 20, 2006

Basics about the camera

Camera Descriptions

- Effective Resolution: $1628 \times 1236 \times 8\text{-bit}$ @ 15 fps.
- Camera Link BASE interface (8-bit RGB).
- Progressive scan.
- Internal sync.
- Internal or external exposure control.
- 36 MHz pixel clock rate.

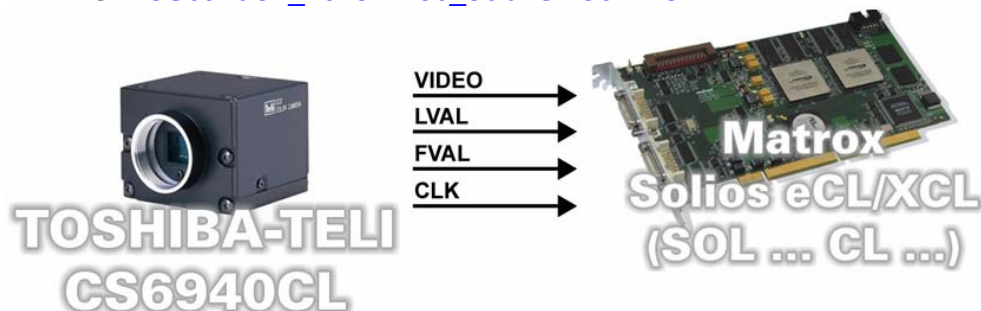
Interface Modes

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

Camera Interface Briefs

Mode 1: Continuous

- $1628 \times 1236 \times 8\text{-bit}$ @ 15 fps.
- Camera Link BASE interface (8-bit RGB).
- Matrox Solios eCL/XCL receiving LVAL, FVAL, PIXEL CLOCK (CLK @ 36 MHz) and video signals from camera.
- DCF: [CS6940CL_1628x1236_8bitRGBCon.DCF](#)



Mode 2: Pseudo-continuous

- $1628 \times 1236 \times 8\text{-bit}$.
- Camera Link BASE interface (8-bit RGB).
- Matrox Solios eCL/XCL sending periodic EXPOSURE1 (CC1) signal to camera to initiate and control exposure time.
- Matrox Solios eCL/XCL receiving LVAL, FVAL, PIXEL CLOCK (CLK @ 36 MHz) and video signals from camera.
- DCF: [CS6940CL_1628x1236_8bitRGBPcon.DCF](#)

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

Basics about the interface modes

Matrox Solios eCL/XCL

Camera Interface Application Note

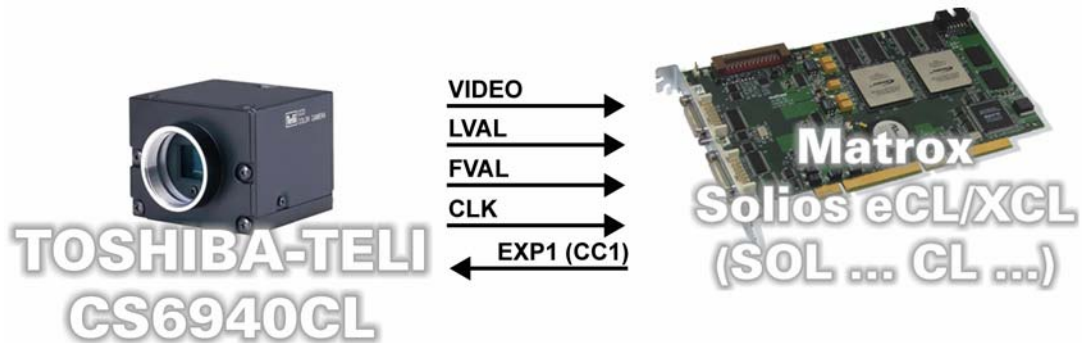
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Basics about the
interface modes

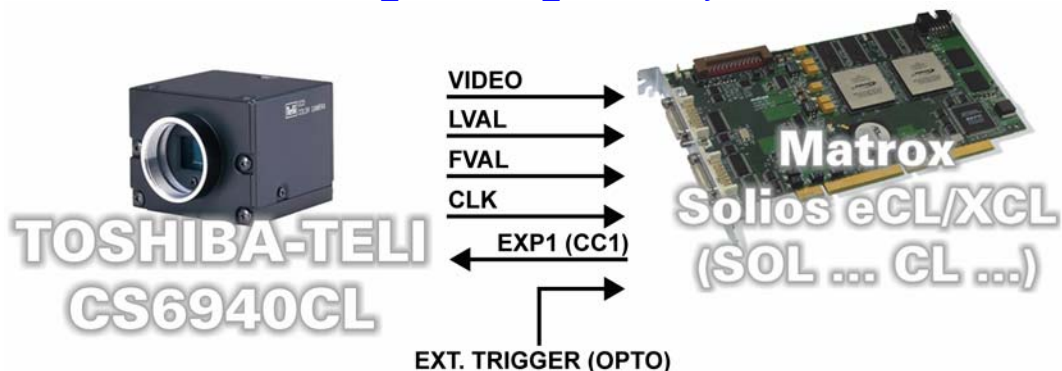
Camera Interface Briefs (continued)

Mode 2: Pseudo-continuous



Mode 3: Asynchronous reset

- 1628 × 1236 × 8-bit.
- Camera Link BASE interface (8-bit RGB).
- Progressive scan.
- Matrox Solios eCL/XCL receiving external OPTO trigger signal.
- Matrox Solios eCL/XCL sending EXPOSURE1 (CC1) signal to camera to initiate and control exposure time.
- Matrox Solios eCL/XCL receiving LVAL, FVAL, PIXEL CLOCK (CLK @ 36 MHz) and video signals from camera.
- DCF used: [CS6940CL_1628x1236_8bitRGBAsync.DCF](#)



Specifics about the
interface modes

Camera Interface Details

Mode 1: Continuous

- **Frame Rate:** With this DCF, the Matrox Solios eCL/XCL receives the continuous video from the camera at 15 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** (default) using the TOSHIBA-TELI Register Controller utility. Refer to the camera manual for the command descriptions.

Mode 2: Pseudo-continuous

- **Frame Rate:** With this DCF, the Matrox Solios 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 the frame readout 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** by writing the following registers in the TOSHIBA-TELI Register Controller utility. Refer to the camera manual for the command descriptions.

Registers				
0x63 = 0	0x66 = 1	0x67 = 1	0x68 = 1	0x60 = 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 frame readout duration.
- **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** by writing the following registers in the TOSHIBA-TELI Register Controller utility. Refer to the camera manual for the command descriptions.

Registers				
0x63 = 0	0x66 = 1	0x67 = 1	0x68 = 1	0x60 = 1

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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.

Matrox Electronic Systems Ltd.

1055 St. Regis Blvd.
Dorval, Quebec H9P 2T4
Canada
Tel: (514) 685-2630
Fax: (514) 822-6273
SOL-CID-026

