Matrox Genesis

Camera Interface Application Note

PULNiX TM-1040 (option 89-1) April 16, 2002

Basics about the camera

Camera Descriptions

- Effective resolution: 1008 × 1018 × 10-bit @ 30 fps.
- Single tap analog/LVDS digital video output.
- Progressive scan.
- Internal (composite) or external sync.
- Internal or external exposure control.
- 40 MHz pixel clock rate.

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

Interface Modes

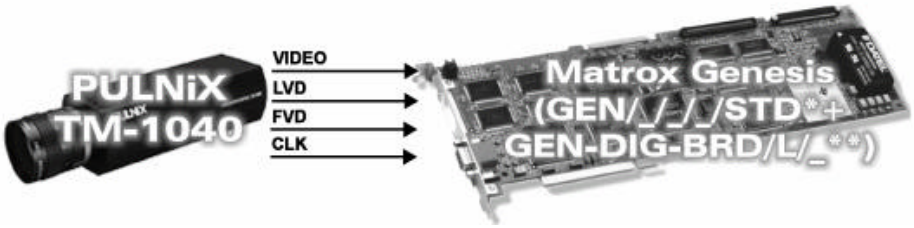
- Continuous
- Asynchronous reset (Pulse Width Control Mode)

Basics about the interface modes

Camera Interface Briefs

Mode 1: Continuous

- 984 × 1010 × 10-bit @ 30 fps.
- Single tap LVDS digital video.
- Progressive scan.
- Matrox Genesis receiving HSYNC (LDV), VSYNC (FDV) and PIXEL CLOCK (CLK @ 40 MHz) signals to camera.
- DCF used: TM1040C.DCF



Mode 2: Asynchronous Reset (Pulse Width Control Mode)

- 984 × 1010 × 10-bit.
- Single tap LVDS digital video.
- Progressive scan.
- Matrox Genesis receiving external TTL trigger signal.
- Matrox Genesis sending EXPOSURE2 (VINIT) signal to camera to initiate and control exposure time.
- Matrox Genesis receiving HSYNC (LDV), VSYNC (FDV) and PIXEL CLOCK (CLK @ 40 MHz) signals to camera.
- DCF used: TM1040A.DCF

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***Matrox Genesis main board with grab module**
****Matrox LVDS digital input board**

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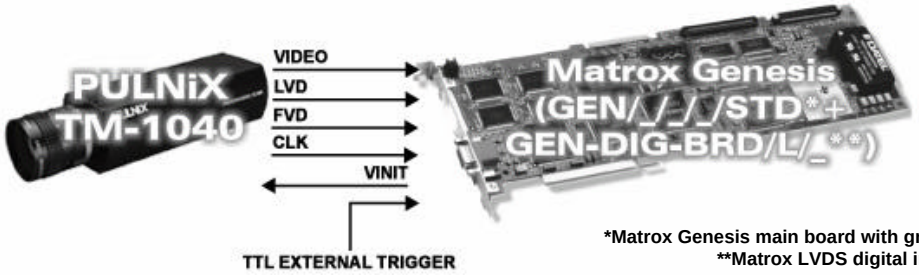
Basics about the interface modes

Camera Interface Briefs (continued)

Mode 2: Asynchronous Reset (Pulse Width Control Mode)



***Matrox Genesis main board with grab module**
****Matrox LVDS digital input board**

Specifics about the interface modes

Camera Interface Details

Modes 1: Continuous

- **Frame Rate:** Matrox Genesis receives the continuous video from the camera at 30 frames per second.
- **Exposure time:** Exposure time is inversely proportionate to the frame rate (no shutter) or determined by the shutter setting. Refer to the camera manual for more information.
- **Camera switch settings:** Refer to the camera manual for additional information. Switches for this mode should be set as follows:

Switches	Settings
Shutter Control	As Desired
Mode Control	0
UP/DWN	UP

Modes 2: Asynchronous Reset (Pulse Width Control Mode)

- **Frame rate**: The frame rate is determined by the frequency of the external trigger signal.
- **Exposure time:** The active and inactive periods of the EXPOSURE2 (VINIT) signal is the exposure time. The default exposure time is equal to **3.82 ms**. The exposure time can be modified in the DCF using Matrox Intellicam, Genesis Native Library (GNL) imCamControl() or with the MIL MdigControl() function. Consult the respective manual for more information.
- **Minimum exposure width:** minimum EXPOSURE2 (TRIGGER) pulse width is equal to **xx** m**s**.
- **Camera switch settings:** Refer to the camera manual for additional information. Switches for this mode should be set as follows:

Switches	Settings
Shutter Control	9
Mode Control	2
UP/DWN	DWN

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Cabling details for this interface mode

Cabling Requirements

Mode 1: Continuous

- **Cable:** DBHD100-TO-OPEN (open ended) cable required for video, synchronization and control signals.
- **Connection:** Connections between the 31-pin connector of the camera and the 100-pin connector of the Matrox Genesis are as follows:

Matrox Genesis (100-pin connector) ***Pin name***	***Pin no.***		**PULNiX TM-1040 (31-pin connector)** ***Pin name***	***Pin no.***
CLOCK, INPUT, +	39	←	CLK+	01
CLOCK, INPUT, -	40	←	CLK-	17
HSYNC, INPUT, +	33	←	LVD+	02
HSYNC, INPUT, -	34	←	LVD-	18
VSYNC, INPUT, +	35	←	FVD+	03
VSYNC, INPUT, -	36	←	FVD-	19
GROUND	50	--	GND	04
GROUND	37	--	GND	16
DATA, INPUT, 0+	01	←	D0+	06
DATA, INPUT, 0-	02	←	D0-	22
DATA, INPUT, 1+	03	←	D1+	07
DATA, INPUT, 1-	04	←	D1-	23
DATA, INPUT, 2+	05	←	D2+	08
DATA, INPUT, 2-	06	←	D2-	24
DATA, INPUT, 3+	07	←	D3+	09
DATA, INPUT, 3-	08	←	D3-	25
DATA, INPUT, 4+	09	←	D4+	10
DATA, INPUT, 4-	10	←	D4-	26
DATA, INPUT, 5+	11	←	D5+	11
DATA, INPUT, 5-	12	←	D5-	27
DATA, INPUT, 6+	13	←	D6+	12
DATA, INPUT, 6-	14	←	D6-	28
DATA, INPUT, 7+	15	←	D7+	13
DATA, INPUT, 7-	16	←	D7-	29
DATA, INPUT, 8+	17	←	D8+	14
DATA, INPUT, 8-	18	←	D8-	30
DATA, INPUT, 9+	19	←	D9+	15
DATA, INPUT, 9-	20	←	D9-	31
EXPOSURE2, OUTPUT, TTL	88*	→	VINIT	20*

*This connection is not required for this mode, however allows this cable to be used with both modes.

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Cabling details for the interface modes

Cabling Requirements (Continued)

Mode 2: Asynchronous Reset (Pulse Width Control Mode)

- **Cable:** IMG-7W2-TO-5BNC and DBHD100-TO-OPEN (open ended) cables required for video, synchronization and control signals.
- **External trigger:** TTL external trigger should be connected to the TTL trigger input of the IMG-7W2-TO-5BNC cable (gray BNC).
- **Connection:** Connections between the 31-pin connector of the camera and the 100-pin connectors of the Matrox Genesis are as in Mode 1: Continuous, along with the following:

Matrox Genesis (100-pin connector)			**PULNiX TM-1040 (31-pin connector)**	
Pin name	***Pin no.***		***Pin name***	***Pin no.***
EXPOSURE2, OUTPUT, TTL	88	→	VINIT	20

Matrox Genesis (BNC connector)			**TTL External Trigger Source**	
Pin name	***Pin no.***			
GRAY BNC	--	←	SIGNAL	--

The DCF(s) mentioned in this application note can be found on the MIL, Native Library CD or our FTP site (ftp.matrox.com). 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.

Corporate headquarters:

Canada and U.S.A.

Matrox Electronic Systems Ltd.
1055 St. Regis Blvd.
Dorval, Quebec H9P 2T4
Canada
Tel: (514) 685-2630
Fax: (514) 822-6273