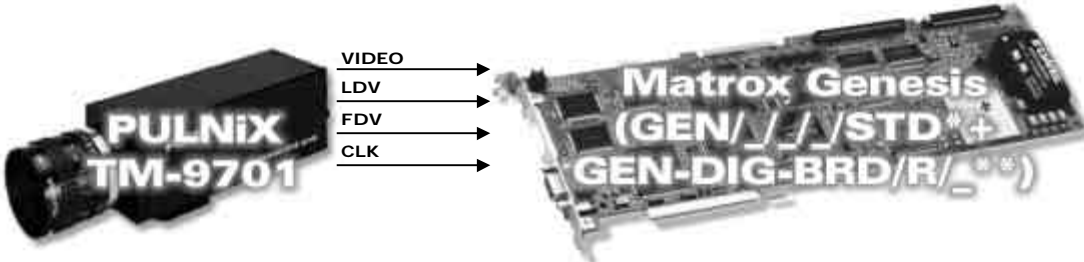
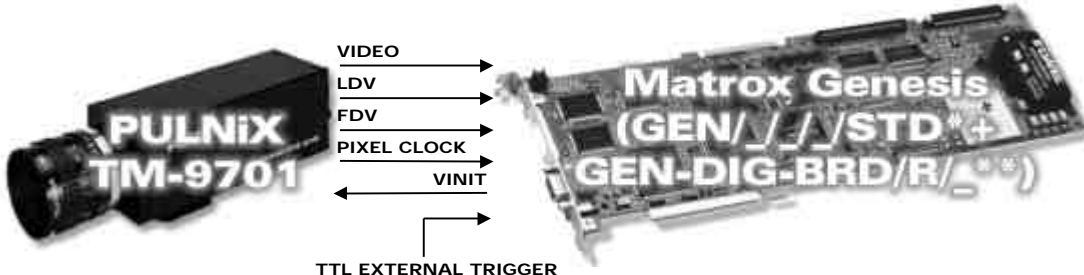


Application Note:

Interfacing non-standard cameras to Matrox Genesis

PULNiX TM-9701

September 24, 1999

Camera Descriptions	<ul style="list-style-type: none"> • 768 x 484 x 8-bit @ up to 60 fps. • Single channel analog or RS-422 digital video output. • Interlaced or Progressive scan. • External or internal exposure control. • External sync. • Pixel clock rate: 14.3182 MHz.
Interface modes	<ul style="list-style-type: none"> • Continuous, Asynchronous Reset (Double Pulse mode)
Camera Interface Briefs	<p>Mode 1: Continuous</p>  <ul style="list-style-type: none"> • 755 x 484 x 8-bit @ 30 fps. • Single channel RS-422 digital video. • Progressive scan. • Continuous video. • Matrox Genesis receiving HSYNC (LDV), VSYNC (FDV), PIXEL CLOCK (CLK @ 14.3182 MHz) and video signals from camera. • DCF used: TM9701C.DCF <p>Mode 2: Asynchronous Reset (Double Pulse mode)</p>  <ul style="list-style-type: none"> • 755 x 484 x 8-bit. • Single channel RS-422 digital video. • Progressive scan. • Matrox Genesis receiving TTL external trigger signal. • Matrox Genesis sending EXPOSURE1 (VINIT) signal to camera: the EXPOSURE1 signal both initiates exposure and controls exposure time. • Matrox Genesis receiving HSYNC (LDV), VSYNC (FDV), PIXEL CLOCK (CLK @ 14.3182 MHz) and video signals from camera. • DCF used: TM9701A.DCF <p><small>*Matrox Genesis Main Board with Grab Module ** Matrox RS-422 Digital Data Input Board</small></p>

Application Note:

Interfacing non-standard cameras to Matrox Genesis

PULNiX TM-9701

September 24, 1999

Camera Interface Details

Mode 1 : Continuous

- **Frame rate:** Matrox Genesis receives the continuous video from the camera at a frame rate equal to 30 frames per second (progressive scan).
- **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:** Switches for this mode should be set as follows:

Mode 1: Continuous

Switches	Settings
Shutter (Speed)	As desired
NRM / ASY	NRM
INT / NON	NON

Mode 2: Asynchronous Reset (Double Pulse mode)

- Once it has received the external trigger signal, Matrox Genesis sends the EXPOSURE1 (VINIT) signal to the camera with a width equal to the desired exposure time.
- **Frame rate:** The frame rate is determined by the frequency of the external trigger signal.
- **Exposure time:** The double pulse signal is created using a combined Timer 1 and Timer 2 signal, output as a single EXPOSURE1 (VINIT) signal. The default exposure time is equal to **20.34 ms**. In order to change the width and deployment time of Timer 1 and Timer 2, use the Exposure Settings menu tab in Matrox Intellicam. Consult the Matrox Intellicam User Guide for more information
- **Minimum exposure width:** minimum EXPOSURE1 (VINIT) pulse width is equal to **10 H** or **635ms**.
- **Camera switch settings:** Switches for this mode should be set as follows:

Mode 2: Asynchronous Reset

Switches	Settings
Shutter (Speed)	9
NRM / ASY	ASY
INT / NON	NON

Application Note:

Interfacing non-standard cameras to Matrox Genesis

PULNiX TM-9701

September 24, 1999

Cabling Requirements

Mode 1: Continuous

- DBHD100-TO-OPEN cable and GEN/DIG/BRD/R/_ board required for digital data, synchronization and control signals.
- Connections between the 31-pin connector of the camera and the 100-pin connector of the GEN-DIG-BRD/R/_ are as follows:

GEN-DIG-BRD/R/_ (100-pin connector)			PULNiX TM-9701 (31-pin connector)	
<i>Pin name</i>	<i>Pin no.</i>		<i>Pin name</i>	<i>Pin no.</i>
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	23
DATA, INPUT, 0+	01	←	D0+	08
DATA, INPUT, 0-	02	←	D0-	24
DATA, INPUT, 1+	03	←	D1+	09
DATA, INPUT, 1-	04	←	D1-	25
DATA, INPUT, 2+	05	←	D2+	10
DATA, INPUT, 2-	06	←	D2-	26
DATA, INPUT, 3+	07	←	D3+	11
DATA, INPUT, 3-	08	←	D3-	27
DATA, INPUT, 4+	09	←	D4+	12
DATA, INPUT, 4-	10	←	D4-	28
DATA, INPUT, 5+	11	←	D5+	13
DATA, INPUT, 5-	12	←	D5-	29
DATA, INPUT, 6+	13	←	D6+	14
DATA, INPUT, 6-	14	←	D6-	30
DATA, INPUT, 7+	15	←	D7+	15
DATA, INPUT, 7-	16	←	D7-	31
EXPOSURE1, OUTPUT, TTL	87*	→	VINIT	20*

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

Application Note:

Interfacing non-standard cameras to Matrox Genesis

PULNiX TM-9701

September 24, 1999

Cabling Requirements (continued)	Mode 2: Asynchronous Reset (Double Pulse mode)				
	<ul style="list-style-type: none">• DBHD100-TO-OPEN and IMG-7W2-TO-5BNC cables, and GEN/DIG/BRD/R/_ board required for external trigger, digital data, synchronization and control signals.• TTL external trigger source should be connected to the TTL trigger input of the IMG-7W2-TO-5BNC cable.• Connections between the 31-pin connector of the camera and the 100-pin connector of the GEN-DIG-BRD/R/_ are as in <i>Mode 1: Continuous</i> with the exception of the following additional connection:				
	GEN-DIG-BRD/R/_ (100-pin connector)			PULNiX TM-9701 (31-pin connector)	
	<i>Pin name</i>	<i>Pin no.</i>		<i>Pin name</i>	<i>Pin no.</i>
	EXPOSURE1, OUTPUT, TTL	87	→	VINIT	20

The DCF(s) mentioned in this application note can be found on the MIL and Native Library CD, or our FTP site ([ftp.matrox.com](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, Canada
H9P 2T4
Tel: (514) 685-7230
Fax: (514) 822-6273

Sales Offices:
U.K.
Matrox (UK) Ltd.
Sefton Park, Stoke Poges
Buckinghamshire
U.K. SL2 4JS
Tel: +44 (0) 1753 665500
Fax: +44 (0) 1753 665599

France
Matrox France SARL
2, rue de la Couture,
Sillic 225
94528 Rungis Cedex
Tel: (0) 1 45-60-62-00
Fax: (0) 1 45-60-62-05

Germany
Matrox GmbH
Inselkammerstr.8
D-82008
Unterhaching
Germany
Tel: 089/614 4740
Fax: 089/614 9743

Asia Pacific
Matrox Asia Liaison Office
Rm. 1901, 19/F, Workington
Tower,
78 Bonham Strand E.,
Sheung Wan, Hong Kong.
Tel: 852.2877.5387
Fax: 852.2537.9530

