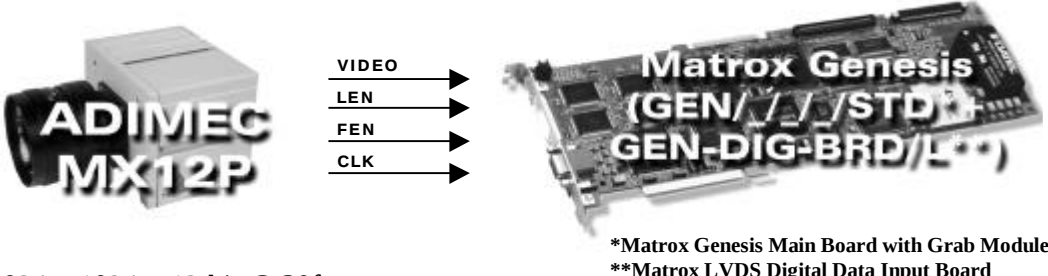
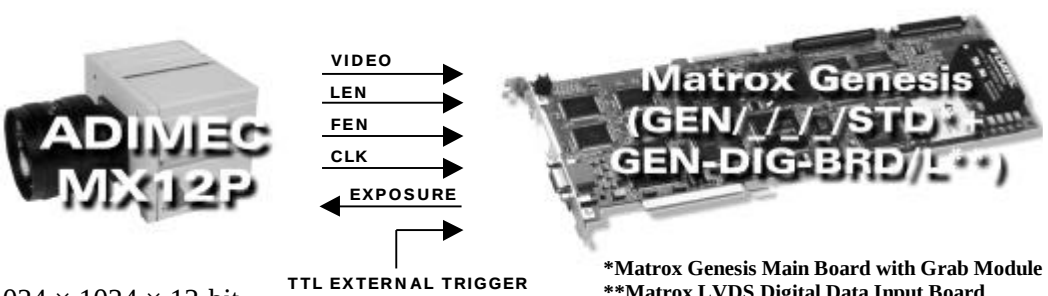


Application Note:

Interfacing non-standard cameras to Matrox Genesis

ADIMEC MX12P

April 30, 1999

Camera Descriptions	• 1024 × 1024 × 12-bit @ up to 30fps. • Single channel LVDS digital video. • Progressive scan. • Exposure control. • Pixel clock rate: 40 MHz.
Interface modes	• Continuous, Control mode
Camera Interface Briefs	Mode 1: Continuous  *Matrox Genesis Main Board with Grab Module **Matrox LVDS Digital Data Input Board • 1024 × 1024 × 12-bit @ 30fps. • Single channel LVDS digital video. • Progressive scan. • Continuous video. • Matrox Genesis receiving HSYNC (LEN), VSYNC (FEN), PIXEL CLOCK (CLK), and video signals from camera. • DCF used: MX12PCG.DCF Mode 2: Control mode  *Matrox Genesis Main Board with Grab Module **Matrox LVDS Digital Data Input Board • 1024 × 1024 × 12-bit. • Single channel LVDS digital video. • Progressive scan. • Matrox Genesis receiving TTL external trigger. • Matrox Genesis sending EXPOSURE 1 (EXPOSURE) signals to camera. • Matrox Genesis receiving HSYNC (LEN), VSYNC (FEN), PIXEL CLOCK (CLK), and video signals from camera. • DCF used: MX12PCNG.DCF

Application Note:

Interfacing non-standard cameras to Matrox Genesis

ADIMEC MX12P

April 30, 1999

Camera Interface Details	Mode 1: Continuous • Frame rate: The frame rate is determined by the camera configuration software. The maximum possible frame rate is 30 frames per second. • Exposure time: Exposure time is inversely proportionate to the frame rate. Mode 2: Control mode • Once it has received the external trigger signal, following a delay, Matrox Genesis sends the EXPOSURE1 (EXPOSURE) signal to the camera, followed by the camera sending the VSYNC (FEN) and HSYNC (LEN) signals to the Matrox Genesis to initiate frame and line readout. • Frame rate: The frame rate is determined by the frequency of the external trigger signal. • Exposure time: The active period of EXPOSURE1 (EXPOSURE) signals is the exposure time. In order to change the width and deployment time of EXPOSURE1 (EXPOSURE) use the Exposure Settings menu tab in Matrox Intellicam. Consult the Matrox Intellicam User Guide for more information. • Minimum Delay width: the minimum delay width (between the rising edge of the external trigger and the rising edge of the EXPOSURE1 (EXPOSURE) signals) is equal to 10 lines. EXTERNAL TRIGGER EXPOSURE1 (EXPOSURE) CAMERA INTERNAL VIDEO The diagram shows four signal traces over time. 1. EXTERNAL TRIGGER: A series of pulses. 2. EXPOSURE1 (EXPOSURE): A pulse that occurs after a 'Delay' from the trigger. The width of this pulse is labeled 'Exposure Time'. 3. CAMERA INTERNAL: A pulse that occurs during the exposure time, labeled 'Integration'. 4. VIDEO: A series of pulses representing 'Frame' readouts, which occur after the integration period. A 'Shift' signal is also indicated between the camera internal and video signals.																														
Cabling Requirements	Mode 1: Continuous • DBHD100-TO-OPEN cable and GEN/DIG/BRD/L board required for digital data, synchronization and control signals. • Connections between the 68-pin connector of the camera and the 100-pin connector of the Matrox Genesis (GEN-DIG-BRD/L) are as follows: <table><tr><td colspan="2">ADIMEC MX12P (68-pin connector)</td><td></td><td colspan="2">GEN-DIG-BRD/L (100-pin connector)</td></tr><tr><td>Pin name</td><td>Pin no.</td><td></td><td>Pin name</td><td>Pin no.</td></tr><tr><td>D11+</td><td>02</td><td>→</td><td>DATA, INPUT, 11+</td><td>23</td></tr><tr><td>D10+</td><td>03</td><td>→</td><td>DATA, INPUT, 10+</td><td>21</td></tr><tr><td>D09+</td><td>04</td><td>→</td><td>DATA, INPUT, 9+</td><td>19</td></tr><tr><td>D08+</td><td>05</td><td>→</td><td>DATA, INPUT, 8+</td><td>17</td></tr></table> continued	ADIMEC MX12P (68-pin connector)			GEN-DIG-BRD/L (100-pin connector)		Pin name	Pin no.		Pin name	Pin no.	D11+	02	→	DATA, INPUT, 11+	23	D10+	03	→	DATA, INPUT, 10+	21	D09+	04	→	DATA, INPUT, 9+	19	D08+	05	→	DATA, INPUT, 8+	17
ADIMEC MX12P (68-pin connector)			GEN-DIG-BRD/L (100-pin connector)																												
Pin name	Pin no.		Pin name	Pin no.																											
D11+	02	→	DATA, INPUT, 11+	23																											
D10+	03	→	DATA, INPUT, 10+	21																											
D09+	04	→	DATA, INPUT, 9+	19																											
D08+	05	→	DATA, INPUT, 8+	17																											

Application Note:

Interfacing non-standard cameras to Matrox Genesis

ADIMEC MX12P

April 30, 1999

Cabling Requirements	ADIMEC MX12P (68-pin connector)		GEN-DIG-BRD/L (100-pin connector)	
	Pin name	Pin no.	Pin name	Pin no.
	D07+	06	→ DATA, INPUT, 7+	15
	D06+	07	→ DATA, INPUT, 6+	13
	D05+	08	→ DATA, INPUT, 5+	11
	D04+	09	→ DATA, INPUT, 4+	09
	D03+	10	→ DATA, INPUT, 3+	07
	D02+	11	→ DATA, INPUT, 2+	05
	D01+	13	→ DATA, INPUT, 1+	03
	D00+	14	→ DATA, INPUT, 0+	01
	FEN+	25	→ VSYNC, INPUT, +	35
	LEN+	26	→ HSYNC, INPUT, +	33
	CLK+	29	→ CLOCK, INPUT, +	39
	TRG+	30	← EXPOSURE1, OUTPUT, +	95
	GND	34	→ GROUND	37
	D11-	36	→ DATA, INPUT, 11-	24
	D10-	37	→ DATA, INPUT, 10-	22
	D09-	38	→ DATA, INPUT, 9-	20
	D08-	39	→ DATA, INPUT, 8-	18
	D07-	40	→ DATA, INPUT, 7-	16
	D06-	41	→ DATA, INPUT, 6-	14
	D05-	42	→ DATA, INPUT, 5-	12
	D04-	43	→ DATA, INPUT, 4-	10
	D03-	44	→ DATA, INPUT, 3-	08
	D02-	45	→ DATA, INPUT, 2-	06
	D01-	47	→ DATA, INPUT, 1-	04
	D00-	48	→ DATA, INPUT, 0-	02
	FEN-	59	→ VSYNC, INPUT, -	36
	LEN-	60	→ HSYNC, INPUT, -	34
	CLK-	63	→ CLOCK, INPUT, -	40
	TRG-	64	← EXPOSURE1, OUTPUT, -	96
	GND	68	→ GROUND	38

Application Note:

Interfacing non-standard cameras to Matrox Genesis

ADIMEC MX12P

April 30, 1999

Cabling Requirements (continued)	Mode 2: Control mode • DBHD100-TO-OPEN and IMG-7W2-TO-5BNC cables, and GEN/DIG/BRD/L board required for external trigger, digital data, synchronization and control signals. • TTL external trigger source should be connected to the TTL trigger input of IMG-7W2-TO-5BNC cable. • All other connections are as in Mode 1: <i>Continuous</i> NOTE contact ADIMEC for information regarding RS-232 to RS-422 converter.
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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.

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