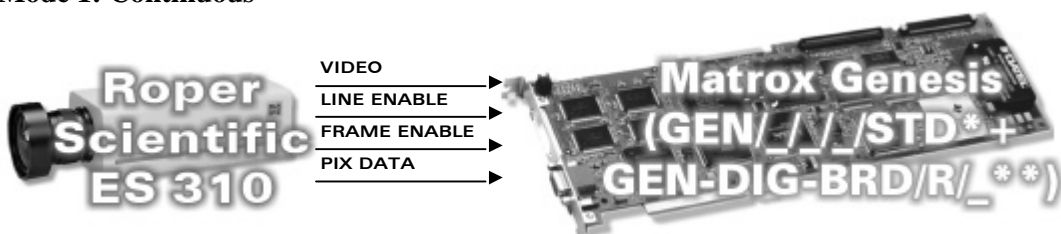
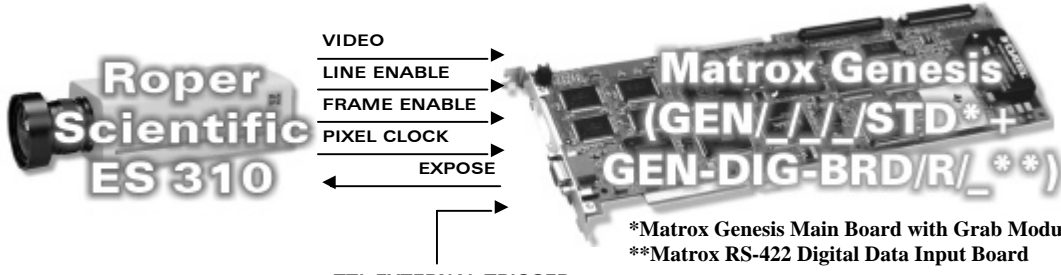


Application Note:

Interfacing non-standard cameras to Matrox Genesis

Roper Scientific MASD (Kodak) ES 310

June 13, 2000

Camera Descriptions	<ul style="list-style-type: none"> • $648 \times 484 \times 8$-bit @ up to 85 fps • Dual channel RS-422 digital video output. • Progressive scan. • Internal or external exposure control. • Internal or external shutter control (shutter on/off). • Pixel clock rate: 20 MHz.
Interface Modes	<ul style="list-style-type: none"> • Continuous, asynchronous reset (trigger).
Camera Interface Briefs	<p>Mode 1: Continuous</p>  <p>*Matrox Genesis Main Board with Grab Module **Matrox RS-422 Digital Data Input Board</p> <ul style="list-style-type: none"> • $648 \times 484 \times 8$-bit @ 30 and 60 fps • Dual channel RS-422 digital video. • Progressive scan. • Continuous video. • Matrox Genesis receiving HSYNC (LINE ENABLE), VSYNC (FRAME ENABLE), PIXEL CLOCK (PIX DATA @ 20 MHz/channel), and video signals. • DCF used: ES310_30.DCF (30 fps) • DCF used: ES310_60.DCF (60 fps) <p>Mode 2: Asynchronous reset (Trigger)</p>  <p>*Matrox Genesis Main Board with Grab Module **Matrox RS-422 Digital Data Input Board</p> <ul style="list-style-type: none"> • $648 \times 484 \times 8$-bit. • Dual channel RS-422 digital video. • Progressive scan. • Matrox Genesis receiving TTL external trigger. • Matrox Genesis sends EXPOSURE1 (EXPOSE) signal to camera to initiate exposure. • Matrox Genesis receiving HSYNC (LINE ENABLE), VSYNC (FRAME ENABLE), PIXEL CLOCK (PIX DATA @ 20 MHz/channel), and video signals. • DCF used: G310ASY.DCF

Application Note:

Interfacing non-standard cameras to Matrox Genesis

Roper Scientific MASD (Kodak) 310

June 13, 2000

Camera Interface Details

Mode 1: Continuous

- **Operating Mode:** set to **Continuous** in the Remote Panel Software.
- **Frame Rate:** frame rate is 30 or 60 frames per second.
- **Exposure time:** exposure time can be adjusted and controlled through the Remote Panel Software. Exposure time can be set between **0.1** and **12 ms**. For an index of the camera settings (commands), refer to the camera manual.

Remote Panel software camera settings

ES310_30.DCF (30 fps)			
MDE	EXE	TRS	FRS
CS	9	AIA	30

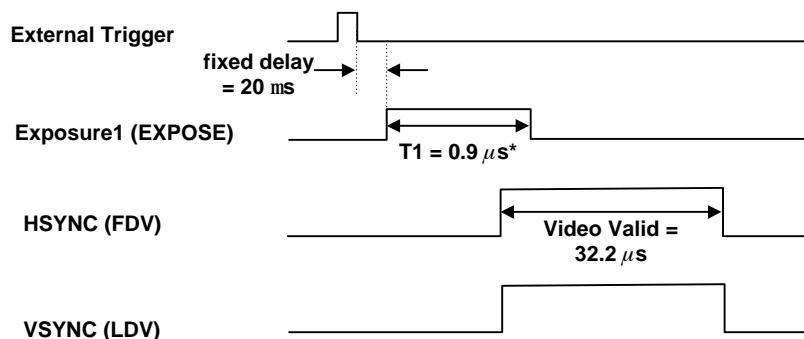
ES310_60.DCF (60 fps)			
MDE	EXE	TRS	FRS
CS	9	AIA	60

Mode 2: Asynchronous reset (Trigger)

- Once it has received the external trigger signal, Matrox Genesis sends the EXPOSURE1 (EXPOSE) signal to the camera. The camera awaits the rising edge of the signal, at which point it initiates exposure. The exposure time is set directly on the camera either by using the camera control software or by sending the control commands via the serial port.
- **Operating Mode:** set to **Trigger** in the Remote Panel Software.
- **Frame Rate:** frame rate is determined by the frequency of the TTL external trigger.
- **Exposure Time:** exposure time can be adjusted and controlled through the Remote Panel Software. Exposure time can be set between **0.05** and **12 ms**.

Remote Panel software camera settings

G310ASY.DCF			
MDE	EXE	TRS	FRS
TR	9	AIA	30*



* Exposure1 (EXPOSE) signal minimum width = 100ns

Application Note:

Interfacing non-standard cameras to Matrox Genesis

Roper Scientific MASD (Kodak) 310

June 13, 2000

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 68-pin row connector of the camera and the 100-pin connector of the GEN-DIG-BRD/R/_ are as follows:

GEN-DIG-BRD/R/_

(100-pin digital interface connector)

ROPER SCIENTIFIC MASD (KODAK) ES 310

(68-pin connector)

Pin name	Pin no.		Pin name	Pin no.
DATA, INPUT, 7+	15	←	BMSB +	10
DATA, INPUT, 7-	16	←	BMSB -	44
DATA, INPUT, 6+	13	←	BMSB1 +	11
DATA, INPUT, 6-	14	←	BMSB1 -	45
DATA, INPUT, 5+	11	←	BMSB2 +	13
DATA, INPUT, 5-	12	←	BMSB2 -	47
DATA, INPUT, 4+	09	←	BMSB3 +	14
DATA, INPUT, 4-	10	←	BMSB3 -	16
DATA, INPUT, 3+	07	←	BMSB4 +	15
DATA, INPUT, 3-	08	←	BMSB4 -	49
DATA, INPUT, 2+	05	←	BMSB5 +	16
DATA, INPUT, 2-	06	←	BMSB5 -	50
DATA, INPUT, 1+	03	←	BMSB6 +	19
DATA, INPUT, 1-	04	←	BMSB6 -	53
DATA, INPUT, 0+	01	←	BMSB7 +	20
DATA, INPUT, 0-	02	←	BMSB7 -	54
CLOCK, INPUT, +	39	←	PIX DATA STRB +	29
CLOCK, INPUT, -	40	←	PIX DATA STRB -	63
HSYNC, INPUT, +	33	←	LINE ENA +	26
HSYNC, INPUT, -	34	←	LINE ENA -	60
VSYNC, INPUT, +	35	←	FRAME ENA +	25
VSYNC, INPUT, -	36	←	FRAME ENA -	59
EXPOSURE1, OUTPUT, +	95	→	EXPOSE +	30
EXPOSURE1, OUTPUT, -	96	→	EXPOSE -	64
GROUND	50		GROUND	01
DATA, INPUT, 15+	31	←	AMSB +	02
DATA, INPUT, 15-	32	←	AMSB -	36
DATA, INPUT, 14+	29	←	AMSB1 +	03
DATA, INPUT, 14-	30	←	AMSB1 -	37
DATA, INPUT, 13+	27	←	AMSB2 +	04
DATA, INPUT, 13-	28	←	AMSB2 -	38
DATA, INPUT, 12+	25	←	AMSB3 +	05
DATA, INPUT, 12-	26	←	AMSB3 -	39
continued				

Application Note:

Interfacing non-standard cameras to Matrox Genesis

Roper Scientific MASD (Kodak) 310

June 13, 2000

Cabling Requirements	GEN-DIG-BRD/R/_ (100-pin digital interface connector)		ROPER SCIENTIFIC MASD (KODAK) ES 310 (68-pin connector)	
	Pin name	Pin no.	Pin name	Pin no.
	DATA, INPUT, 11+	23	← AMSB 4+	06
	DATA, INPUT, 11-	24	← AMSB 4-	40
	DATA, INPUT, 10+	21	← AMSB 5+	07
	DATA, INPUT, 10-	22	← AMSB 5-	41
	DATA, INPUT, 9+	19	← AMSB 6+	08
	DATA, INPUT, 9-	20	← AMSB 6-	44
	DATA, INPUT, 8+	17	← AMSB 7+	09
	DATA, INPUT, 8-	18	← AMSB 7-	43
<p>Mode 2: Asynchronous reset (Trigger)</p> <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 OPTO_TRIG Input of the IMG-7W2-TO-5BNC cable. • Connections between the 68-pin row connector of the camera and the 100-pin connector of the GEN-DIG-BRD/R/_ are as in Mode 1: <i>Continuous</i> 				

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 Electronic 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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