

MATROX GENESIS

CAMERA INTERFACE APPLICATION NOTE

REDLAKE MASD (KODAK) ES310T SEPTEMBER 5, 2001

Basics about the camera

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

Basics about the interface modes

Camera Descriptions

- $648 \times 484 \times 8$ -bit @ up to 125 fps.
- Single channel analog or RS-422 digital video output.
- Progressive scan.
- Internal sync.
- External exposure control.
- 25 MHz pixel clock rate.

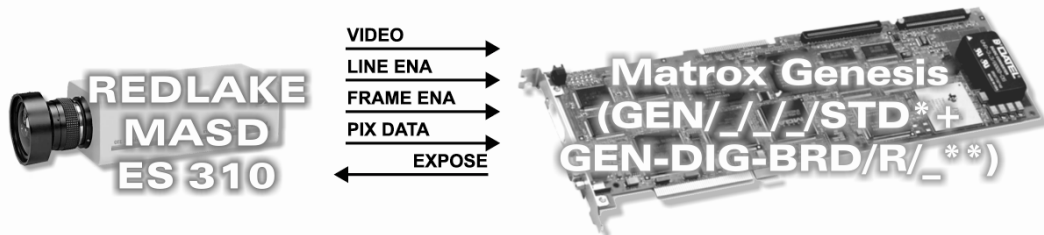
Interface Modes

- Continuous
- Asynchronous reset (Trigger)

Camera Interface Briefs

Mode 1: Continuous

- $648 \times 484 \times 8$ -bit @ 30 fps.
- Single channel RS-422 digital video.
- Progressive scan.
- Matrox Genesis receiving HSYNC (LINE ENA), VSYNC (FRAME ENA), PIXEL CLOCK (PIX DATA @ 25 MHz) and video signals from camera.
- DCF used: [ES310TC.DCF](#)



Mode 2: Asynchronous Reset (Trigger)

- $648 \times 484 \times 8$ -bit.
- Dual channel RS-422 digital video.
- Progressive scan.
- Matrox Genesis receiving TTL external trigger signal.
- Matrox Genesis sending EXPOSURE1 (EXPOSE) signal to camera to initiate and control exposure time.
- Matrox Genesis receiving HSYNC (LINE ENA), VSYNC (FRAME ENA), PIXEL CLOCK (PIX DATA @ 25 MHz) and video signals from camera.

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*Matrox Genesis main board with grab module

**MatroxRS-422 digital data input board

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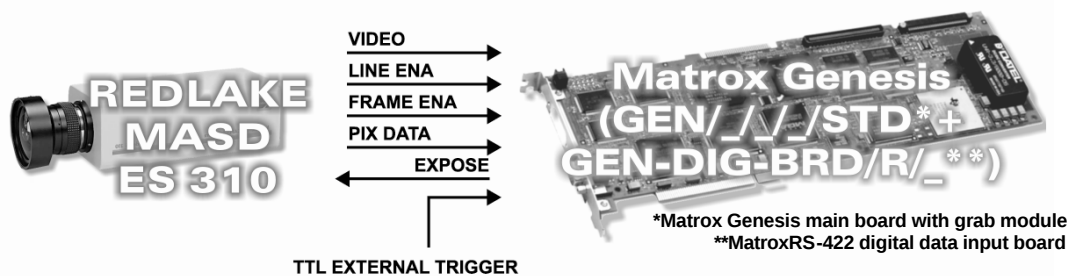
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Basics about the
interface modes

Camera Interface Briefs (Continued)

Mode 2: Asynchronous Reset (Trigger)

- DCF used: [ES310TA.DCF](#)



Specifics about the
interface modes

Camera Interface Details

Mode 1: Continuous

- Frame Rate:** Matrox Genesis receives the continuous video from the camera at 30 frames per second.
- Exposure time:** Exposure time is controlled by the Remote Panel software setting. Exposure time can be set between 66 microsecond and 1/frame rate in milliseconds.
- Remote Panel software settings:** Refer to the camera manual for additional information. Settings for this mode should be set as follows:

ES310TC.DCF			
MDE	EXE	TRS	FRS
CS	xx*	AIA	30

* as desired

Mode 2: Asynchronous Reset (Trigger)

- Frame rate:** The frame rate is determined by the frequency of the external trigger signal.
- Exposure time:** The rising edge of the EXPOSURE1 (EXPOSE) signal initiates the exposure; exposure period is controlled through the Remote Panel software. For frequencies $\leq 30\text{Hz}$, set EXE as desired. Otherwise EXE 100 = 04.700 (maximum 60Hz trigger, if EXE > 0.4700 then frame rate drops by 1/2) or EXE 2 = 00.094 for 85Hz. Maximum exposure time equals 96 ms. Refer to the camera manual for more information.
- Remote Panel software settings:** Refer to the camera manual for additional information. Settings for this mode should be set as follows:

ES310TA.DCF			
MDE	EXE	TRS	FRS
TR	*	AIA	**

* see explanation above

** any setting since external trigger frequency determines frame rate

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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 68-pin connector of the camera and the 100-pin connectors of the Matrox Genesis are as follows:

GEN-DIG-BRD/R/_ (100-pin connector)			REDLAKE MASD ES310T (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 -	48
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
DATA, INPUT, 11+	23	←	AMSB 4+	06
DATA, INPUT, 11-	24	←	AMSB 4-	40

* Connection not necessary for this mode however allows this cable to be used for both modes.

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Cabling details for this
interface mode

Cabling Requirements (Continued)

Mode 1: Continuous

- **Connection:** Connections between the 68-pin connector of the camera and the 100-pin connectors of the Matrox Genesis are as follows:

GEN-DIG-BRD/RI_ (100-pin connector)			REDLAKE MASD ES310T (68-pin connector)	
Pin name	Pin no.		Pin name	Pin no.
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-	42
DATA, INPUT, 8+	17	←	AMSB 7+	09
DATA, INPUT, 8-	18	←	AMSB 7-	43

Mode 2: Asynchronous Reset (Trigger)

- **Cable:** IMG-7W2-TO-5BNC and DBHD100-TO-OPEN (open ended) cables required for video, synchronization and control signals.
- **External Trigger:** TTL external trigger source should be connected to the TTL trigger input of IMG-7W2-TO-5BNC cable.
- **Connection:** All other connections are as in Mode 1: *Continuous*

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:ftp.matrox.com)). The information furnished by Matrox Electronic Systems, 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

